

ENVIRONMENTAL PRODUCT DECLARATION

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

[Polyurethane Window & Door]

From

[Tinoyou Architectural Decoration

(Shanghai) Co., Ltd.]



Declared product: TICO polyurethane window & door



Programme operator:	EPD China
Registration number:	EPD-CN-00047
Issued date:	2026-05-06
Valid until:	2031-05-06

Programme Information

EPD Owner	Tinoyou Architectural Decoration (Shanghai) Co., Ltd. Address: Room 1101, Block A, No. 685, HuaXu Road, Xujing Town, Qingpu District, Shanghai, China Email: anni-sun@sheld.com
Product Name	TICO polyurethane window & door: TICO 72, TICO 80, TICO 95, TICO 101, and TICO 170
Production Site	No. 5 Yangmingshan Avenue, Suqian City, Jiangsu Province, China
Identification of product	UNCPC code 4212
Field of Application	Window and Door
Programme Operator	EPD China Address of Headquarter: Tianping Road, Xuhui District, Shanghai Website: www.epdchina.cn Email: info@epdchina.cn secretary@epdchina.cn
LCA Practitioner	Chao WANG, Ecovane environmental, support@lmi1.cn
Responsibility	The EPD owner has the sole ownership, liability, and responsibility for the EPD
Comparability	EPD of construction products may not be comparable if they do not comply with EN 15804+A2. EPDs within same category of product in different programme operator are not suggested to be compared. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible even applying the same PCR.
Liability	The EPD owner has the sole ownership, liability, and responsibility for the EPD.
Validity	The EPD is published on 2026-05-06 and valid to 2031-05-06
LCA Software (version)	Simapro 10.3
LCI Dataset (version)	Ecoinvent 3.11 (EN15804 database)
Characterisation factors	EF 3.1
Year(s) of Primary Data	01/2024-12/2024
PCR	CORE PCR for Construction Products and Services: ICMQ 001, Rev. 3.2 EPD Italy 025 - SUB PCR EN 17213 - Windows and Pedestrian Doorsets, Rev. 1.0
Other Reference Document	ISO 14025
Verification statement according EN15804	
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐ internal ☒ external Third-party institution verification: <Siyao Chen, Bureau Veritas> is an approved certification body accountable for third-party verification Approved by: EPD China	
Procedure for follow-up of data during EPD validity involves a third-party certification body: ☐ Yes ☒ No	

1 General Information

1.1 Company information

EPD Owner: Tinoyou Architectural Decoration (Shanghai) Co., Ltd.

Contact: anni-sun@shcld.com

Address: Room 1101, Block A, No. 685, HuaXu Road, Xujing Town, Qingpu District, Shanghai, China

Production site: No. 5 Yangmingshan Avenue, Suqian City, Jiangsu Province, China

Description of the company

Established in 1991, Tinoyou Architectural Decoration is a high-tech enterprise specializing in the development and manufacturing of energy-saving building materials over 30 years, mainly engaged in the research and development, large-scale production, promotion, and application of polyurethane composite materials.

The main products under Collidin include glass fiber reinforced polyurethane window and door profiles, polyurethane composite components, polyurethane exterior wall coatings, flame-retardant polyether, polyurethane exterior wall waterproofing and insulation, etc. We are one of the companies in the industry that practices ultra-low energy consumption building projects.

1.2 Scope and type of EPD

System boundary: Cradle-to-grave (A-D)

System diagram:

Table 1 Process stages and EPD modules

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
	Raw material supply	Transport	Production	Transport from the gate to the	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/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
Module Declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note: X=Declared Module, MND=Module not Declared in this LCA study

2 Detailed Product Description

TICO polyurethane window & door products are high-performance building products designed to integrate thermal insulation with structural strength. The material combines the thermal properties of polyurethane with the mechanical strength of fiberglass, resulting in a durable and energy-efficient solution. The products feature a triple-sealing structure using automotive-grade EPDM seals, which enhances air tightness, sound insulation, and hardware longevity. The design supports modern architectural needs with versatile styling, a variety of color options, and specialized surface coatings tailored for composite materials.

Key technical features of TICO polyurethane window & door products include mechanical corner and frame assembly for improved connection integrity, universal U-groove hardware compatibility with enhanced security and anti-theft functions, and fire resistance capable of withstanding temperatures over 900°C due to the material's 80% inorganic composition. The upgraded wall thickness design, exceeding 4mm in key stress areas, ensures higher shear resistance and overall safety. TICO polyurethane window & door products also support ultra-low energy consumption and meet strict thermal performance standards. TICO® polyurethane window & door products are positioned as innovative solutions that bring aerospace-grade composite technology into civil construction. They align with national energy-saving and carbon reduction policies, offering a sustainable, safe, and high-performance option for modern green buildings.



Figure 1 Picture of the declared product

A detailed TICO polyurethane window & door products specification is depicted below in Table 2.

Table 2 Technical specifications of products

Technical feature		TICO 72	TICO 80	TICO 95	TICO 101	TICO 170	Stand ards
Frame type of material		Fiberglass reinforced polyurethane					-
Profile frame width (mm)		72	80	95	101	170	-
Glass type		Triple					-
Glass configuration		5Low-e+9A+5+9A+5, 5Low-e+12A+5+12A+5, 5Low-e+12A+5Low-e+12A+5, 5Low-e+12A+5Low-e+12A+5warm edge spacer	5Low-e+9A+5+9A+5, 5Low-e+12A+5+12A+5, 5Low-e+12A+5Low-e+12A+5, 5Low-e+16A+5Low-e+16A+5, 5Low-e+16A+5Low-e+16A+5warm edge spacer	5Low-e+12A+5+12A+5, 5Low-e+18A+5Low-e+18A+5, 5Low-e+18A+5Low-e+18A+5w arm edge spacer, 5Low-e+18A warm edge spacer+5Low-e+18A warm edge spacer+5	5Low-e+12A+5+12A+5, 6Low-e+12A+6Low-e+12A+6, 6Low-e+19A+6Low-e+19A+6	5Low-e+12A+5+12A+5, 6Low-e+12A+6Low-e+12A+6, 6Low-e+19A+6Low-e+19A+6	-
Gasket type of material		Aluminium alloy					-
Hardware type of material		Steel					-
Accessories type of material	Screw	Stainless steel					-
	Sealing strip	EPDM					-
	Lined steel	Aluminium alloy					-
	Sealant	Polydimethylsiloxane					-
Thermal performance (W/m ² ·K) (Determined by glass properties)		1.1~1.5	1.0~1.3	0.8~1.4	0.78~1.4	1.2~1.4	GB/T 8484-2008
Acoustic performance		Class 4	Class 4	Class 4	Class 4	Class 3	GB/T 7106-2008
Air permeability		Class 8	Class 8	Class 8	Class 8	Class 8	GB/T 7106-2008

Waterproof	Class 6	Class 6	Class 6	Class 6	Class 6	GB/T 7106-2008
Wind resistance	Class 9	Class 9	Class 9	Class 9	Class 9	GB/T 7106-2008
Window types	Inward, Tilt & Turn, Outward, Top-Hung Outward, Inswing, Outswing					-
Sample selection						
	TICO 72	TICO 80	TICO 95	TICO 101	TICO 170	The sample is selected as a regular product of TICO, which has a high sales volume.
Size(m)	1.5*1.8	1.5*1.8	1.5*1.8	1.5*1.8	2*2.2	
Glass configuration	5Low-e+12A+5+12A+5					
Thermal performance (W/m2·K)	K≤1.4					
Metal component selection	The material is galvanized carbon steel, which complies with European standards.					

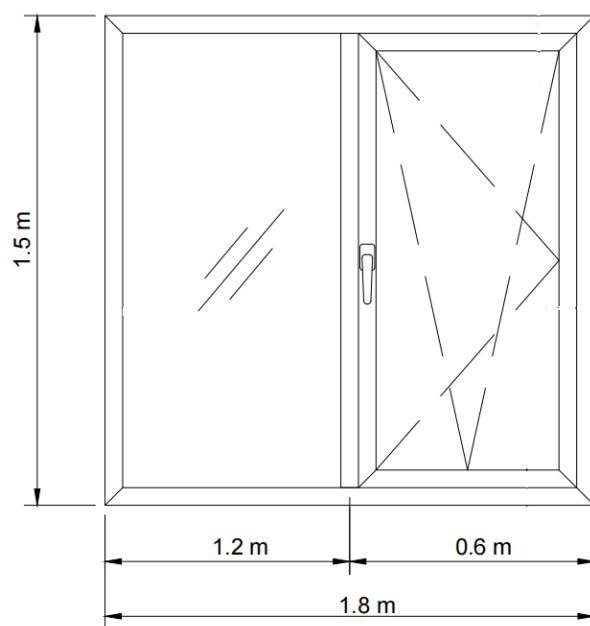


Figure 2 Structure of TICO 72/80/95/101

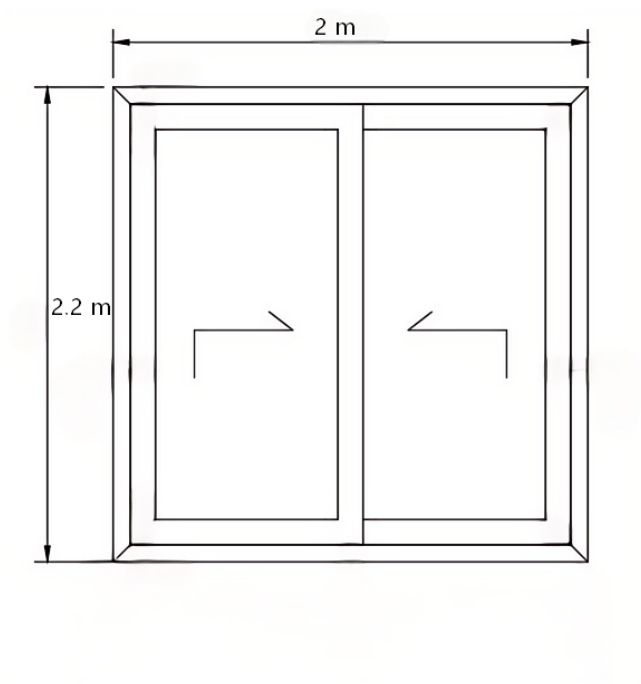


Figure 3 Structural of TICO 170

Description of the production processes

TICO polyurethane window & door products under study are manufactured following the production processes as shown in figure 4 below. For simplification purpose, only main stages of product assembly are presented, raw material, auxiliary processes considered in the LCA but not shown in the flow chart below include:

- Raw and auxiliary material production and transportation
- Supply of natural gas / water / electricity

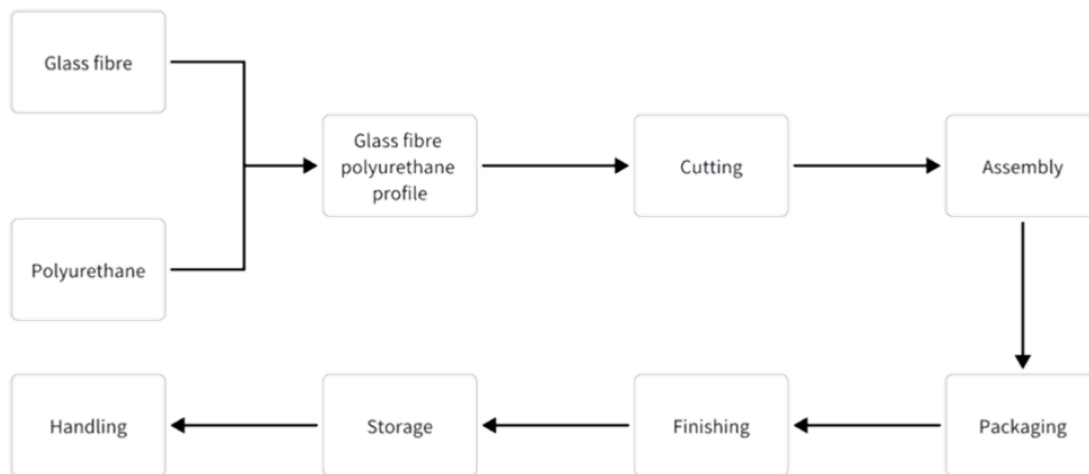


Figure 4 Production process flowchart of TICO polyurethane window & door products

Description of function unit

In this study the functional unit is defined as one square meter of TICO polyurethane window & door products.

Table 1 Functional unit

Name	Value	Unit
Functional unit	1	m2

RSL		30	years
Mass conversion factor of functional unit	TICO 72	38.87	kg/m2
	TICO 80	39.93	kg/m2
	TICO 95	40.25	kg/m2
	TICO 101	41.01	kg/m2
	TICO 170	46.62	kg/m2

Mass conversion method is to weight the standard window & door product and then transfer to 1 m2. For example, TICO 72 series window and door product, the standard size is 1.8m*1.5m, the mass conversion factor is the weight of each component divided by 1.8*1.5.

Product component

Table 4 Raw materials and packaging materials of products

Raw materials	Unit	TICO 72	TICO 80	TICO 95	TICO 101	TICO 170
Fiberglass reinforced polyurethane	kg	7.85	9.33	9.65	10.89	16.17
Glass	kg	28.41	28.00	28.00	27.55	26.31
Bracket	kg	0.24	0.24	0.24	0.24	0.13
Screw	kg	0.19	0.19	0.19	0.19	0.12
Hardware	kg	1.06	1.06	1.06	1.06	1.31
Sealing strip	kg	0.53	0.53	0.53	0.53	1.00
Lined steel	kg	0.18	0.18	0.18	0.18	-
Sealant	kg	0.40	0.40	0.40	0.40	0.33
Hook cover plate	kg	-	-	-	-	0.57
Fan Hook	kg	-	-	-	-	0.68
Packaging materials	Unit	TICO 72	TICO 80	TICO 95	TICO 101	TICO 170
Carton	kg	0.00464	0.00464	0.00464	0.00464	0.00464
Packaging film	kg	0.00463	0.00463	0.00463	0.00463	0.00463
Flat pallet	kg	9.28	9.28	9.28	9.28	9.28

After checking the production and product substance list, there is one toxic chemicals and hazardous substances listed in the List of Toxic Chemicals Severely Restricted on the Import and Export in China (Circular No. 65 [2005]) and Measures for the Administration of Restricted Use of Hazardous Substances in Electrical and Electronic Products (Circular No. 32 [2016]).

Table 2 Hazardous substance in product

Ingredient Name	CAS Number	Chemical formula
Polyurethane	9016-87-9	C15-H10-N2-O2

3 LCA results according to EN 15804

3.1 Environmental Impacts

The results of the underlying LCA are provided in this section as environmental impacts, resource use, output flows and additional information on biogenic carbon. All pre-set parameters of EN 15804 are required.

Table 3 Environmental impacts of TICO 72

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO ₂ eq.]	8.84E+01	1.17E+01	1.75E+01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.89E-01	4.98E+00	6.01E+00	-1.38E+01
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO ₂ eq.]	1.04E+02	1.17E+01	1.52E+00	0.00E+00	3.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.89E-01	4.97E+00	5.04E+00	-1.37E+01
Global Warming Potential biogenic (GWP-biogenic)	[kg CO ₂ eq.]	-1.60E+01	2.07E-03	1.60E+01	0.00E+00	5.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.86E-05	6.81E-03	9.72E-01	-1.86E-02
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO ₂ eq.]	4.06E-01	6.00E-03	1.05E-03	0.00E+00	5.07E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-04	9.04E-03	3.13E-04	-4.09E-02
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.25E-04	1.60E-07	2.01E-08	0.00E+00	4.48E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.14E-09	7.32E-08	8.10E-09	-1.08E-07
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	7.36E-01	2.48E-01	8.70E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-03	2.46E-02	3.98E-03	-7.80E-02
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	2.91E-02	6.96E-04	5.46E-04	0.00E+00	1.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-05	2.14E-03	4.41E-04	-4.67E-03
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	1.44E-01	6.34E-02	3.45E-03	0.00E+00	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.88E-04	4.80E-03	4.02E-03	-1.44E-02
Eutrophication potential, Accumulated	[mol N eq.]	1.54E+00	7.03E-01	2.63E-02	0.00E+00	3.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.40E-03	4.84E-02	1.74E-02	-1.48E-01



Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Exceedance (EP-terrestrial)																
Formation potential of tropospheric ozone (POCP)	[kg NMVO C eq.]	4.72E-01	1.96E-01	6.28E-03	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-03	1.89E-02	5.51E-03	-4.73E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	2.73E-03	2.06E-05	1.49E-05	0.00E+00	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-06	4.77E-06	9.72E-07	-1.17E-04
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	1.31E+03	1.50E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.42E+00	9.92E+01	7.74E+00	-1.62E+02
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	2.87E+01	5.93E-01	4.80E-01	0.00E+00	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-02	9.88E-01	3.16E+00	-3.44E+00

Table 4 Environmental impacts of TICO 80

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	9.24E+01	1.20E+01	1.75E+01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-01	4.93E+00	6.78E+00	-1.42E+01
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	1.08E+02	1.20E+01	1.52E+00	0.00E+00	3.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-01	4.91E+00	5.63E+00	-1.41E+01
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	-1.60E+01	2.13E-03	1.60E+01	0.00E+00	5.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.11E-05	6.73E-03	1.15E+00	-1.91E-02
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO2 eq.]	4.43E-01	6.17E-03	1.05E-03	0.00E+00	5.07E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-04	8.92E-03	3.42E-04	-4.16E-02



Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.25E-04	1.64E-07	2.01E-08	0.00E+00	4.48E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.28E-09	7.24E-08	8.46E-09	-1.13E-07
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	7.63E-01	2.55E-01	8.70E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-03	2.43E-02	4.34E-03	-7.95E-02
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	3.03E-02	7.15E-04	5.46E-04	0.00E+00	1.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-05	2.11E-03	5.18E-04	-4.81E-03
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	1.51E-01	6.52E-02	3.45E-03	0.00E+00	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.04E-04	4.75E-03	4.53E-03	-1.47E-02
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	1.61E+00	7.22E-01	2.63E-02	0.00E+00	3.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.58E-03	4.78E-02	1.90E-02	-1.52E-01
Formation potential of tropospheric ozone (POCP)	[kg NMVO C eq.]	4.92E-01	2.01E-01	6.28E-03	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.29E-03	1.87E-02	6.01E-03	-4.85E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	3.11E-03	2.11E-05	1.49E-05	0.00E+00	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-06	4.71E-06	1.06E-06	-1.18E-04
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	1.37E+03	1.54E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.57E+00	9.81E+01	8.14E+00	-1.68E+02
Water (user) deprivation potential,	[m3 world]	3.00E+01	6.10E-01	4.80E-01	0.00E+00	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-02	9.76E-01	3.12E+00	-3.51E+00



Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
deprivation-weighted water consumption (WDP)	eq. Deprived															

Table 5 Environmental impacts of TICO 95

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO ₂ eq.]	9.45E+01	1.21E+01	1.75E+01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-01	4.93E+00	6.95E+00	-1.43E+01
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO ₂ eq.]	1.10E+02	1.21E+01	1.52E+00	0.00E+00	3.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-01	4.91E+00	5.76E+00	-1.42E+01
Global Warming Potential biogenic (GWP-biogenic)	[kg CO ₂ eq.]	-1.60E+01	2.14E-03	1.60E+01	0.00E+00	5.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.18E-05	6.73E-03	1.19E+00	-1.92E-02
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO ₂ eq.]	4.51E-01	6.22E-03	1.05E-03	0.00E+00	5.07E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-04	8.92E-03	3.49E-04	-4.17E-02
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.25E-04	1.65E-07	2.01E-08	0.00E+00	4.48E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.32E-09	7.24E-08	8.56E-09	-1.14E-07
Acidification potential, Accumulated Exceedance (AP)	[mol H ⁺ eq.]	7.70E-01	2.57E-01	8.70E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E-03	2.43E-02	4.43E-03	-7.99E-02
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	3.06E-02	7.21E-04	5.46E-04	0.00E+00	1.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-05	2.11E-03	5.35E-04	-4.84E-03
Eutrophication potential, fraction of nutrients reaching marine end	[kg N eq.]	1.52E-01	6.57E-02	3.45E-03	0.00E+00	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.09E-04	4.75E-03	4.64E-03	-1.48E-02





Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
compartment (EP-marine)																
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	1.62E+00	7.28E-01	2.63E-02	0.00E+00	3.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.63E-03	4.78E-02	1.94E-02	-1.53E-01
Formation potential of tropospheric ozone (POCP)	[kg NMVO C eq.]	4.97E-01	2.03E-01	6.28E-03	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-03	1.87E-02	6.12E-03	-4.87E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	3.19E-03	2.13E-05	1.49E-05	0.00E+00	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-06	4.71E-06	1.08E-06	-1.18E-04
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	1.39E+03	1.55E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.61E+00	9.81E+01	8.24E+00	-1.69E+02
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	3.03E+01	6.15E-01	4.80E-01	0.00E+00	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E-02	9.76E-01	3.12E+00	-3.53E+00

Table 6 Environmental impacts of TICO 101

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	9.85E+01	1.41E+01	1.75E+01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-01	4.86E+00	7.60E+00	-1.47E+01
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	1.14E+02	1.41E+01	1.52E+00	0.00E+00	3.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-01	4.84E+00	6.25E+00	-1.46E+01
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	-1.60E+01	2.49E-03	1.60E+01	0.00E+00	5.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.36E-05	6.64E-03	1.35E+00	-1.96E-02





Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO ₂ eq.]	4.83E-01	7.22E-03	1.05E-03	0.00E+00	5.07E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-04	8.80E-03	3.74E-04	-4.23E-02
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.25E-04	1.92E-07	2.01E-08	0.00E+00	4.48E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.43E-09	7.16E-08	8.84E-09	-1.19E-07
Acidification potential, Accumulated Exceedance (AP)	[mol H ⁺ eq.]	7.94E-01	2.98E-01	8.70E-03	0.00E+00	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03	2.40E-02	4.73E-03	-8.12E-02
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	3.16E-02	8.36E-04	5.46E-04	0.00E+00	1.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.48E-05	2.08E-03	6.00E-04	-4.96E-03
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	1.59E-01	7.62E-02	3.45E-03	0.00E+00	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.21E-04	4.68E-03	5.07E-03	-1.51E-02
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	1.68E+00	8.45E-01	2.63E-02	0.00E+00	3.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.76E-03	4.72E-02	2.07E-02	-1.55E-01
Formation potential of tropospheric ozone (POCP)	[kg NMVO C eq.]	5.15E-01	2.35E-01	6.28E-03	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-03	1.84E-02	6.53E-03	-4.97E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	3.50E-03	2.47E-05	1.49E-05	0.00E+00	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-06	4.65E-06	1.15E-06	-1.18E-04
Abiotic depletion potential for fossil	MJ, net calorific	1.44E+03	1.80E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E+00	9.69E+01	8.56E+00	-1.75E+02





Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
resources (ADP-fossil)	value															
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	3.14E+0 1	7.13E-0 1	4.80E-0 1	0.00E+0 0	1.54E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	3.31E-0 2	9.63E-0 1	3.08E+0 0	-3.59E+0 0

Table 7 Environmental impacts of TICO 170

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	[kg CO2 eq.]	1.20E+0 2	1.41E+0 1	1.75E+0 1	0.00E+0 0	3.01E-0 2	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	4.67E-0 1	4.91E+0 0	1.23E+0 1	-1.97E+0 1
Global Warming Potential fossil fuels (GWP-fossil)	[kg CO2 eq.]	1.35E+0 2	1.41E+0 1	1.52E+0 0	0.00E+0 0	3.00E-0 2	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	4.67E-0 1	4.89E+0 0	1.03E+0 1	-1.96E+0 1
Global Warming Potential biogenic (GWP-biogenic)	[kg CO2 eq.]	-1.60E+0 1	2.49E-0 3	1.60E+0 1	0.00E+0 0	5.21E-0 5	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	1.06E-0 4	6.64E-0 3	2.00E+0 0	-2.60E-0 2
Global Warming Potential land use and land use change (GWP-luluc)	[kg CO2 eq.]	6.25E-01	7.23E-0 3	1.05E-0 3	0.00E+0 0	5.07E-0 5	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	2.14E-0 4	8.79E-0 3	4.98E-0 4	-5.26E-0 2
Depletion potential of the stratospheric ozone layer (ODP)	[kg CFC 11 eq.]	1.04E-04	1.92E-0 7	2.01E-0 8	0.00E+0 0	4.48E-0 9	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	6.17E-0 9	7.47E-0 8	1.06E-0 8	-1.64E-0 7
Acidification potential, Accumulated Exceedance (AP)	[mol H+ eq.]	9.20E-01	2.98E-0 1	8.70E-0 3	0.00E+0 0	1.61E-0 4	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	1.97E-0 3	2.42E-0 2	6.53E-0 3	-1.07E-0 1
Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	[kg P eq.]	3.76E-02	8.37E-0 4	5.46E-0 4	0.00E+0 0	1.35E-0 5	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	5.09E-0 5	2.09E-0 3	8.83E-0 4	-6.67E-0 3



Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	[kg N eq.]	1.88E-01	7.63E-02	3.45E-03	0.00E+00	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.05E-04	4.72E-03	7.70E-03	-2.00E-02
Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	[mol N eq.]	1.96E+00	8.46E-01	2.63E-02	0.00E+00	3.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.68E-03	4.76E-02	2.88E-02	-2.06E-01
Formation potential of tropospheric ozone (POCP)	[kg NMVO C eq.]	6.14E-01	2.35E-01	6.28E-03	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.68E-03	1.88E-02	8.89E-03	-6.60E-02
Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	[kg Sb eq.]	4.92E-03	2.47E-05	1.49E-05	0.00E+00	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-06	4.69E-06	1.56E-06	-1.51E-04
Abiotic depletion potential for fossil resources (ADP-fossil)	MJ, net calorific value	1.77E+03	1.80E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.50E+00	9.97E+01	1.05E+01	-2.37E+02
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m3 world eq. Deprived]	3.91E+01	7.14E-01	4.80E-01	0.00E+00	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-02	9.67E-01	2.92E+00	-4.74E+00

3.2 Resource use and waste categories

Table 8 Resource use and waste categories for TICO 72

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT) (primary)	MJ	1.31E+03	1.50E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.42E+00	9.92E+01	7.74E+00	-1.62E+02



energy and primary energy resources used as raw materials)																	
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	8.31E+01	0.00E+00	3.14E+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
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	1.22E+03	1.50E+02	2.11E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.42E+00	9.92E+01	7.74E+00	-1.62E+02
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	3.99E+02	1.48E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.55E-02	7.39E+00	1.52E-01	-3.19E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.57E+02	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
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.41E+02	1.48E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.55E-02	7.39E+00	1.52E-01	-3.19E+01
Net use of fresh water (FW)	m3	7.16E-01	1.45E-02	1.03E-02	0.00E+00	3.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.63E-04	2.69E-02	7.35E-02	-8.94E-02
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazardous waste disposed (HWD)	kg	1.36E-02	8.60E-04	2.79E-04	0.00E+00	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-05	4.47E-04	6.13E-05	-2.26E-03
Non-hazardous waste disposed	kg	1.01E+01	2.55E+00	5.53E+00	0.00E+00	2.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-01	1.19E-01	2.27E+01	-6.50E-01





(NHWD)																	
Radioactive waste disposed (RWD)	kg	1.34E-03	2.06E-05	1.23E-05	0.00E+00	9.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-06	1.41E-04	1.95E-06	-2.01E-04
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	1.65E+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	6.59E+00	0.00E+00
Materials for recycling (MR)	kg	1.33E-01	0.00E+00	2.34E+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	9.78E+00	0.00E+00	0.00E+00
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	2.87E+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	1.09E+01	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	5.77E+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	2.21E+01	0.00E+00

Table 9 Resource use and waste categories for TICO 80

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	1.37E+03	1.54E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.57E+00	9.81E+01	8.14E+00	-1.68E+02
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	9.26E+01	0.00E+00	3.14E+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
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	1.28E+03	1.54E+02	2.11E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.57E+00	9.81E+01	8.14E+00	-1.68E+02
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	4.04E+02	1.52E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-02	7.30E+00	1.65E-01	-3.24E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.57E+02	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



Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.46E+02	1.52E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-02	7.30E+00	1.65E-01	-3.24E+01
Net use of fresh water (FW)	m3	7.49E-01	1.49E-02	1.03E-02	0.00E+00	3.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.84E-04	2.65E-02	7.26E-02	-9.13E-02
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazardous waste disposed (HWD)	kg	1.43E-02	8.84E-04	2.79E-04	0.00E+00	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-05	4.43E-04	6.50E-05	-2.28E-03
Non-hazardous waste disposed (NHWD)	kg	1.06E+01	2.62E+00	5.53E+00	0.00E+00	2.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.59E-01	1.17E-01	2.28E+01	-6.57E-01
Radioactive waste disposed (RWD)	kg	1.39E-03	2.12E-05	1.23E-05	0.00E+00	9.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-06	1.40E-04	2.10E-06	-2.11E-04
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	1.65E+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	7.70E+00	0.00E+00
Materials for recycling (MR)	kg	1.33E-01	0.00E+00	2.34E+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	9.65E+00	0.00E+00	0.00E+00
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	2.87E+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	1.25E+01	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	5.77E+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	2.53E+01	0.00E+00

Table 10 Resource use and waste categories for TICO 95

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	1.39E+03	1.55E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.61E+00	9.81E+01	8.24E+00	-1.69E+02
Use of non-renewable primary energy resources used as raw	MJ	9.47E+01	0.00E+00	3.14E+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

materials (PENRM)																	
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	1.29E+03	1.55E+02	2.11E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.61E+00	9.81E+01	8.24E+00	-1.69E+02
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	4.05E+02	1.54E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-02	7.30E+00	1.68E-01	-3.25E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.57E+02	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
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.48E+02	1.54E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-02	7.30E+00	1.68E-01	-3.25E+01
Net use of fresh water (FW)	m3	7.57E-01	1.50E-02	1.03E-02	0.00E+00	3.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.90E-04	2.65E-02	7.26E-02	-9.17E-02
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazardous waste disposed (HWD)	kg	1.45E-02	8.91E-04	2.79E-04	0.00E+00	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.80E-05	4.43E-04	6.59E-05	-2.29E-03
Non-hazardous waste disposed (NHWD)	kg	1.08E+01	2.64E+00	5.53E+00	0.00E+00	2.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-01	1.17E-01	2.29E+01	-6.59E-01
Radioactive waste disposed (RWD)	kg	1.40E-03	2.14E-05	1.23E-05	0.00E+00	9.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-06	1.40E-04	2.13E-06	-2.13E-04
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	1.65E+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	7.94E+00	0.00E+00
Materials for recycling (MR)	kg	1.33E-01	0.00E+00	2.34E+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	9.65E+00	0.00E+00	0.00E+00



Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	2.87E+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	1.28E+01	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	5.77E+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	2.60E+01	0.00E+00

Table 11 Resource use and waste categories for TICO 101

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	1.44E+03	1.80E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E+00	9.69E+01	8.56E+00	1.75E+02
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	1.03E+02	0.00E+00	3.14E+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
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	1.34E+03	1.80E+02	2.11E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E+00	9.69E+01	8.56E+00	1.75E+02
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	4.09E+02	1.78E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.97E-02	7.19E+00	1.79E-01	3.29E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.57E+02	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
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.52E+02	1.78E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.97E-02	7.19E+00	1.79E-01	3.29E+01





Net use of fresh water (FW)	m3	8.52E-01	1.74E-02	1.03E-02	0.00E+00	3.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.14E-04	2.62E-02	8.59E-02	-9.33E-02
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazardous waste disposed (HWD)	kg	1.51E-02	1.03E-03	2.79E-04	0.00E+00	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.88E-05	4.37E-04	6.90E-05	-2.31E-03
Non-hazardous waste disposed (NHWD)	kg	1.12E+01	3.06E+00	5.53E+00	0.00E+00	2.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-01	1.16E-01	2.30E+01	-6.65E-01
Radioactive waste disposed (RWD)	kg	1.46E-03	2.48E-05	1.23E-05	0.00E+00	9.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-06	1.38E-04	2.26E-06	-2.22E-04
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	1.65E+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	8.87E+00	0.00E+00
Materials for recycling (MR)	kg	1.33E-01	0.00E+00	2.34E+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	1.12E+01	0.00E+00	0.00E+00
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	2.87E+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	1.41E+01	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	5.77E+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	2.86E+01	0.00E+00

Table 12 Resource use and waste categories for TICO 170

Core indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT) (primary energy and primary energy resources used as raw materials)	MJ	1.77E+03	1.80E+02	2.43E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.50E+00	9.97E+01	1.05E+01	-2.37E+02
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	1.57E+02	0.00E+00	3.14E+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
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw	MJ	1.61E+03	1.80E+02	2.11E+01	0.00E+00	3.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.50E+00	9.97E+01	1.05E+01	-2.37E+02



materials (PENRE)																	
Total use of renewable primary energy resources (PERT) (primary energy and primary energy resources used as raw materials)	MJ	4.31E+02	1.78E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.05E-02	7.18E+00	2.43E-01	-3.91E+01
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.57E+02	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
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	2.74E+02	1.78E+00	1.36E+00	0.00E+00	4.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.05E-02	7.18E+00	2.43E-01	-3.91E+01
Net use of fresh water (FW)	m3	9.70E-01	1.74E-02	1.03E-02	0.00E+00	3.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.16E-04	2.63E-02	6.79E-02	-1.23E-01
Use of secondary material (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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 (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hazardous waste disposed (HWD)	kg	1.99E-02	1.03E-03	2.79E-04	0.00E+00	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-05	4.57E-04	8.76E-05	-2.99E-03
Non-hazardous waste disposed (NHWD)	kg	1.34E+01	3.06E+00	5.53E+00	0.00E+00	2.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.02E-01	1.17E-01	2.39E+01	-8.31E-01
Radioactive waste disposed (RWD)	kg	1.70E-03	2.48E-05	1.23E-05	0.00E+00	9.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-06	1.38E-04	2.98E-06	-3.07E-04
Materials for energy recovery (MER)	kg	0.00E+00	0.00E+00	1.65E+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	1.36E+01	0.00E+00
Materials for recycling (MR)	kg	1.33E-01	0.00E+00	2.34E+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	9.49E+00	0.00E+00	0.00E+00
Components for re-use (CRU)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE)	MJ	0.00E+00	0.00E+00	2.87E+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	2.28E+01	0.00E+00
Exported thermal energy (EET)	MJ	0.00E+00	0.00E+00	5.77E+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	4.61E+01	0.00E+00

3.3 Information on biogenic carbon content

Information on biogenic carbon content which shall be included in the EPD as follows:

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	4.3637	kg C
NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂ .		

3.4 Additional impact indicators

Table 16 Optional additional impact indicators for TICO 72

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	9.07E-06	5.37E-07	1.06E-07	0.00E+00	2.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-08	2.19E-07	5.92E-08	-1.57E-06
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq	5.43E+00	8.45E-02	4.90E-02	0.00E+00	3.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-03	5.80E-01	7.87E-03	-8.38E-01
Eco-toxicity -freshwater (ETP-fw)	CTU _e	1.60E+03	1.65E+01	3.70E+02	0.00E+00	1.02E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.90E-01	1.29E+01	3.45E+01	-6.12E+01



Human toxicity, cancer effect (HTP-c)	CTUh	8.11E-08	2.31E-09	1.31E-09	0.00E+00	2.57E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.59E-11	6.01E-10	1.56E-09	-6.95E-09
Human toxicity, non-cancer effects (HTP-nc)	CTUh	1.57E-06	5.64E-08	4.97E-08	0.00E+00	1.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.37E-09	2.79E-08	4.56E-08	-1.13E-07
Land use related impacts/Soil quality (SQP)	dimensionless	2.43E+03	3.83E+01	8.16E+00	0.00E+00	8.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.18E+00	1.06E+01	1.42E+01	-1.06E+02

Table 13 Optional additional impact indicators for TICO 80

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	9.30E-06	5.52E-07	1.06E-07	0.00E+00	2.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-08	2.17E-07	6.28E-08	-1.58E-06
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq	5.64E+00	8.69E-02	4.90E-02	0.00E+00	3.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.48E-03	5.73E-01	8.48E-03	-8.80E-01





Eco-toxicity -freshwater (ETP-fw)	CTUe	1.68E+0 3	1.70E+0 1	3.70E+0 2	0.00E+0 0	1.02E-0 1	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	1.02E+0 0	1.27E+0 1	4.00E+0 1	-6.19E+0 1
Human toxicity, cancer effect (HTP-c)	CTUh	8.65E-0 8	2.38E-0 9	1.31E-0 9	0.00E+0 0	2.57E-1 1	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	6.77E-1 1	5.94E-1 0	1.81E-0 9	-7.00E-0 9
Human toxicity, non-cancer effects (HTP-nc)	CTUh	1.75E-0 6	5.80E-0 8	4.97E-0 8	0.00E+0 0	1.03E-0 9	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	3.46E-0 9	2.76E-0 8	5.30E-0 8	-1.15E-0 7
Land use related impacts/Soil quality (SQP)	dimensionless	2.44E+0 3	3.93E+0 1	8.16E+0 0	0.00E+0 0	8.24E-0 2	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	3.27E+0 0	1.05E+0 1	1.45E+0 1	-1.06E+0 2

Table 14 Optional additional impact indicators for TICO 95

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	9.37E-0 6	5.56E-0 7	1.06E-0 7	0.00E+0 0	2.03E-0 9	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	3.21E-0 8	2.17E-0 7	6.37E-0 8	-1.58E-0 6



Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq	5.70E+00	8.76E-02	4.90E-02	0.00E+00	3.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.51E-03	5.73E-01	8.62E-03	-8.89E-01
Eco-toxicity -freshwater (ETP-fw)	CTUe	1.70E+03	1.71E+01	3.70E+02	0.00E+00	1.02E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+00	1.27E+01	4.12E+01	-6.21E+01
Human toxicity, cancer effect (HTP-c)	CTUh	8.77E-08	2.40E-09	1.31E-09	0.00E+00	2.57E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.82E-11	5.94E-10	1.87E-09	-7.00E-09
Human toxicity, non-cancer effects (HTP-nc)	CTUh	1.79E-06	5.84E-08	4.97E-08	0.00E+00	1.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-09	2.76E-08	5.46E-08	-1.15E-07
Land use related impacts/Soil quality (SQP)	dimensionless	2.45E+03	3.97E+01	8.16E+00	0.00E+00	8.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.30E+00	1.05E+01	1.46E+01	-1.06E+02



Table 15 Optional additional impact indicators for TICO 101

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	9.58E-06	6.45E-07	1.06E-07	0.00E+00	2.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-08	2.14E-07	6.65E-08	-1.59E-06
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq	5.94E+00	1.02E-01	4.90E-02	0.00E+00	3.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.60E-03	5.65E-01	9.12E-03	-9.23E-01
Eco-toxicity -freshwater (ETP-fw)	CTUe	1.77E+03	1.99E+01	3.70E+02	0.00E+00	1.02E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E+00	1.26E+01	4.58E+01	-6.26E+01
Human toxicity, cancer effect (HTP-c)	CTUh	9.22E-08	2.78E-09	1.31E-09	0.00E+00	2.57E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.96E-11	5.86E-10	2.08E-09	-7.04E-09
Human toxicity, non-cancer effects (HTP-nc)	CTUh	1.94E-06	6.78E-08	4.97E-08	0.00E+00	1.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E-09	2.72E-08	6.08E-08	-1.17E-07
Land use related	dimensionless	2.46E+03	4.60E+01	8.16E+00	0.00E+00	8.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.36E+00	1.04E+01	1.48E+01	-1.07E+02



impacts/Soil quality (SQP)																
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Table 16 Optional additional impact indicators for TICO 170

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions (PM)	Disease incidence	1.09E-05	6.46E-07	1.06E-07	0.00E+00	2.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.72E-08	2.15E-07	8.24E-08	-2.06E-06
Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq	6.92E+00	1.02E-01	4.90E-02	0.00E+00	3.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.23E-03	5.64E-01	1.20E-02	-1.28E+00
Eco-toxicity -freshwater (ETP-fw)	CTU _e	2.01E+03	1.99E+01	3.70E+02	0.00E+00	1.02E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+00	1.28E+01	7.01E+01	-8.14E+01
Human toxicity, cancer effect (HTP-c)	CTU _h	1.17E-07	2.78E-09	1.31E-09	0.00E+00	2.57E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.90E-11	5.94E-10	3.17E-09	-9.08E-09
Human toxicity, non-cancer	CTU _h	2.63E-06	6.79E-08	4.97E-08	0.00E+00	1.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.04E-09	2.74E-08	9.33E-08	-1.54E-07





effects (HTP-nc)																
Land use related impacts/Soi l quality (SQP)	dimensionle ss	2.53E+0 3	4.61E+0 1	8.16E+0 0	0.00E+0 0	8.24E-0 2	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	0.00E+0 0	3.82E+0 0	1.05E+0 1	1.62E+0 1	-1.16E+0 2



4 Supplementary information

4.1 Calculation rules

Assumptions

- Loss rate is assumed as 5%, and sensitive analysis is conducted.
- Transport assumptions are made where it is not possible to obtain the specific data. When this occurs, it is clearly stated in the report, and a sensitivity analysis is conducted. In module A4, product transportation is assumed and estimated with reference from external resources.
- It is assumed that no specialized deconstruction processes are required for the TICO® polyurethane window & door products in module C1.
- During the end-of-life stage, the transportation of the waste window and door from the operation site to treatment facilities such as dismantling site and disposal facilities is assumed to be 50km for simplification in module C3 and C4, and a sensitivity analysis is conducted.

Cut of rules

- All inputs and outputs to a (unit) process will be included in the calculation for which data is available. Data gaps may be filled by conservative assumptions with average or generic data. Any assumptions for such choices will be documented.
- In case of insufficient input data or data gaps for a unit process, according to the EN 15804 requirement, the cut-off criteria chosen is 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows of the cradle to grave stage, e.g. per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5% of energy usage and mass.

Data quality

- Existing LCI data were, at most, 10 years old. Newly collected LCI data were current or up to 3 years old.
- The LCI data related to the geographical locations in which the processes occurred, e.g. electricity and transportation data from China, disposal in North America, the Asia Pacific, Europe etc.
- The technology represented the average technologies at the time of data collection.
- Geographic coverage shall reflect operational reality of the different life cycle stages.
- Data sets shall be aligned with the system boundaries defined.

Allocations

- Multi-input processes: For data sets in this study, the allocation of the inputs from coupled processes is generally carried out via the mass. For literature data, the source is generally referred to. Specially in allocating the energy within the production site i.e. electricity, natural gas etc. and some other raw material such as water etc., allocation is via both mass and size of the product produced on a yearly average. The principle for choosing the mass and size is based on the relationship of the input to the output (of product) to the environmental impacts.
- Multi-output processes: In this study, there is no other by-products produced from the production line, hence there is quite little occasion that requires allocation for multi-output processes. One allocation occurs on the environmental emissions allocation, especially in waste treatment. In the end-of-life stage, the allocation within the disposal scenario follows mass allocation, which applies to waste treatment process inventory adopted from Ecoinvent data.

Electricity mix

The grid mix data on electricity of for the site in Suqian is based on grid mixes of the State Grid East China Branch (ECGC). Electricity mix has been modelled from Ecoinvent database 3.11. The electricity inventory is based on the year of 2022 for Chinese electricity generation (China Energy Statistics). In Chinese map of electricity generation, thermal power is the principal part of total national installed capacity and electricity generation in China. Development of hydropower is slower than the speed of thermal power development, and nuclear power is still in its initial step of development in China. Power generation from renewable energy resources, such as wind, solar energy and tide, is usually not included due to the small share in electricity generation in China, however the renewable energy was also considered in this study by taking into account the small ratio of wind, solar and other renewable energy generation in China. The GHG emission of ECGC is 0.764 kg CO₂-eq/kWh.

4.2 Scenarios and additional technical information

- Raw materials

According to the estimate by Tinoyou, all the raw materials are sourced from East China.

- Manufacturing

The manufacturing process of TICO polyurethane window & door products mainly includes profile manufacturing, cutting, assembly and packaging, which involves raw materials, energy and emissions. The life cycle inventory data of TICO polyurethane window & door products including input and output data of energy and other packaging materials. And all the life cycle inventory data of manufacturing is calculated and submitted by Tinoyou.

- Transportation

The transportation mainly takes place on the upstream of raw material supply and downstream of product delivery. All the raw materials are delivered from Jiangsu Province where the manufacturing site is located. The information related to transportation including distance and vehicle is shown in table below.

Table 21 Transportation of raw materials and packaging materials

Materials	Source	Distance/km	Vehicle
Fiberglass reinforced polyurethane	Zhejiang/Shanghai	500	Lorry
Glass	Suqian	30	Lorry
Bracket	Shanghai	30	Lorry
Screw	Suqian	30	Lorry
Hardware	Suqian	500	Lorry
Sealing strip	Suqian	300	Lorry
Lined steel	Suqian	30	Lorry
Sealant	Suqian	30	Lorry
Hook cover plate	Suqian	300	Lorry
Fan Hook	Suqian	30	Lorry
Painting	Suqian	30	Lorry
Emery	Suqian	30	Lorry
Packaging film	Suqian	30	Lorry
Flat pallet	Suqian	30	Lorry
Carton	Suqian	30	Lorry

According to Tinoyou, most of TICO polyurethane window & door products are consumed in North America, Europe and the Asian-Pacific region. Oceanic and road transportation distance for product delivery is estimated with reference from external resources. In this study a default value for the distance is given in table below.

Table 22 Transportation of products

Market location	Ratio	Distance (km)	Vehicle
North America	65%	500	Lorry
		20000	Container via Ship
EU	20%	500	Lorry
		24000	Container via Ship
the Asian-Pacific region	15%	500	Lorry
		16000	Container via Ship

- Installation

TICO® polyurethane window & door products require sealant, foaming agent and screw to be applied for the installation, and the number of materials used is shown in table below. Note that there is no VOCs emission during the installation.

Table 23 Materials used for installation of TICO polyurethane window & door products

Material name	value	Unit
Sealant	0.16	kg
Foaming agent	0.005	kg
Screw	0.05	kg

According to Tinoyou, the target market of TICO® polyurethane window & door products including North America, Europe and the Asian-Pacific region. The disposal of packaging materials will adopt a rough country and region weighted average disposal mode following literature review.

Table 24 Packaging disposal in the target market

Nation	Ratio	Packaging type	Recycle	Landfill	Incineration
North America	65%	paper	68.00%	26%	6.00%
		wood	17.00%	67%	16.00%
		plastic	8.50%	76%	15.50%
EU	20%	paper	81.50%	9.30%	9.20%
		wood	32.00%	39.00%	29%
		plastic	37.60%	23.80%	38.60%
the Asian-Pacific region	15%	paper	50.30%	44.20%	5.50%
		wood	51.40%	38.10%	10.50%
		plastic	11.50%	87.50%	1.00%

- Use & Maintenance

Very little effort is required in order to use TICO polyurethane window & door products, hence in the usage stage the focus is put on maintaining the floor tile in terms of protecting its integrity and functionality. In normal condition, routine cleaning is required. The water consumption data is based on estimation from Tinoyou and study of average product's usage data, the table below demonstrates the amount used in this LCA study.

Table 25 Inputs in maintenance stage

Input component	Amount	Unit	Scenario
Water consumption	36	kg/FU	Based on monthly cleaning and 0.1L/m ² per cleaning operation

- Disposal

According to EN17213, the PVC-U window & door products can be 100% manually removed from the building in C1 stage. For the waste scenario, transport to the waste treatment (C2) and transport to landfill (C4) of glass component is 30% and 70%, and non-glass component is 75% and 25% respectively, and the waste transport distance is assumed as 50km. Waste treatment (C3) stage of the window & door products including recycling and incineration with energy recovery. Due to the differences between PU and PVC-U, the disposal scenario is conservatively modelled as "other plastics". The C3 stage default data includes sorting facility operations (1.8 kWh/t diesel for loading/unloading, 2.2 kWh/t electricity for mechanical sorting) and material processing (7.4 kWh/t diesel for steel fragging, 0.8 kWh/t diesel for others).

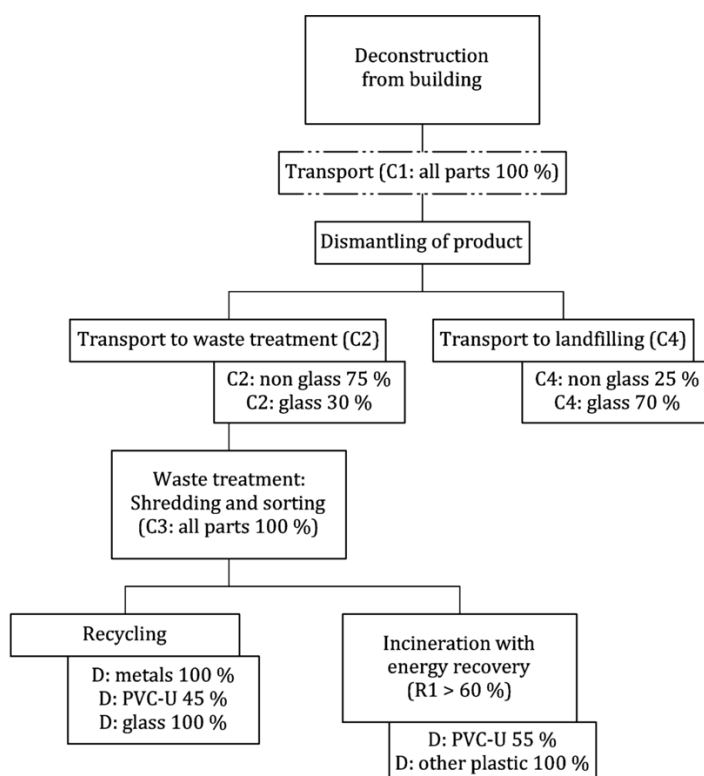


Figure 5 Product disposal of TICO® polyurethane window & door products

- Benefits and loads beyond the system boundaries

According to the disposal scenarios, there are two benefits from disposal stage which are recycled content and energy recovery from incineration:

- Net benefits of recycled content

$$(M_{MR\ out} - M_{MR\ in}) * (M_{MR\ after\ EoW\ out} - M_{VM\ sub\ out} * Q_{R\ out} / Q_{R\ sub})$$

- Energy recovery benefits from incineration

$$M_{ER\ out} * (LVH * X_{ER\ heat} * E_{SE\ heat} + LVH * X_{ER\ elec} * E_{SE\ elec})$$

Based on the disposal scenarios, recycling content is the mix of FRP, glass and metal. According to EN17213, the recycling efficiency is 90%. The energy recovery benefits are from packaging materials disposed at installation stage, and the FRP and other plastic disposal at C4 stage.

4.3 Dangerous substances

There are no dangerous substances into indoor air, oil and water during the use stage.

4.4 Other optional additional environmental information

Not public

References

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