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ENVIRONMENTAL PRODUCT DECLARATION

IIn accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Ytong isolation panel / Ytong for Ceilings

The EPD is for specific product produced in two sites – Pardes-Hana and Ashkelon from Ytong

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

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GENERAL INFORMATION

Programme information

Programme:	The International EPD® System
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804:2012+A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): 2019:14, Construction products, version 1.3.4, UN CPC - 3755.
PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com Chair of the PCR review: Claudia A. Peña
Life Cycle Assessment (LCA)
LCA accountability: *Shai Ben Aharon, KVS*
Differences Versus Previous Versions 2025-06-19 version 1 2025-08-07 version 1.1 ***Editorial change:*** New photos and design
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Samara Costa* *PIEP* *https://www.piep.pt/* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804:2012+A2:2019/AC:2021, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804:2012+A2:2019/AC:2021 and ISO 14025:2006.

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Company information

Owner of the EPD: Ytong
Description of the organisation: Ytong is a leading company in the Israeli construction industry for over 70 years, the company flagship product is the white Ytong block that was developed in Sweden and imported to the Pardes Hana factory in the 50s. Over the years the company expanded its product range and opened new factories.

Ytong products enable advanced methods for conventional and industrial construction for the application of building envelopes, interior partitions, ceilings, insulation and prefabricated products. In addition, architectural and functional elements for environmental and landscape architecture and safety and accessibility products. Pipes, control chambers and concrete elements for the development of underground systems.
Product-related or management system-related certifications: Ytong is certified ISO 9001:2015.
Name and location of production site(s): Ytong manufacturing sites are located in Ashkelon and Pardes Hana, Israel.

Product information

Product name: Ytong isolation panel / Ytong for Ceilings
Product identification: Autoclaved aerated concrete blocks
Product description: autoclaved aerated concrete blocks for use in ceilings.
Specifications:

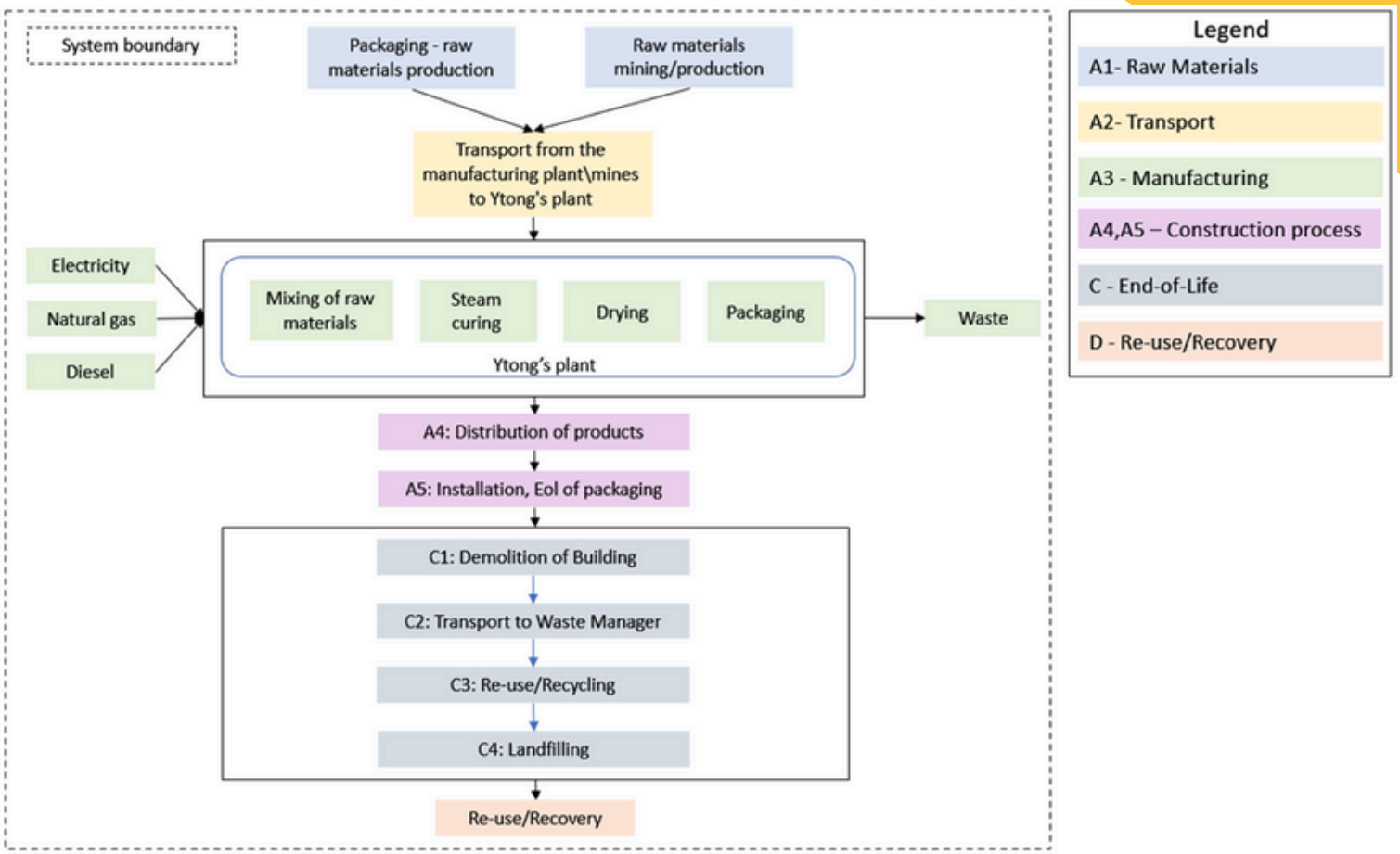
Specification	Per 1 unit
Dry density [kg/m^3]	280±50
Dry thermal conductivity λ10, dry [W/mK]	0.074
Declared moisture conversion Factor Z	1.05
Declared compressive strength [Mpa]	1.0
Declared pullout strength [Mpa]	0.1

Product test standard: The product complies with the Israeli standard 268.
UN CPC code: 3755- Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone
Geographical scope: The study represents the manufacturing of the block in Ytong manufacturing facilities in Pardes Hana and Ashkelon in Israel. Modules A4, A5 and the end-of-life scenario of the products is application, demolishment and recycling in Israel, according to market research that was conducted.

LCA information

The results are an average of two manufacturing plants, based on annual production.
Declared unit: 1 m^3 of block.
Time representativeness: The time coverage of the LCA's data is from January to December 2023.
Database(s) and LCA software used: The software used is SimaPro, Analyst 9.6.0.1. The database used is the Ecoinvent database v3.10 (2023) using the cut-off, EN15804 system model and EF 3.1 normalization.
Description of system boundaries: Cradle to gate with options (A1-A5), modules C1–C4, and module D (A + C + D).
Electricity grid CO_2 coefficient: the CO_2 coefficient of the electricity grid is 0.56 kg CO_2-eq/kWh (2023) based on the renewable and non-renewable fuel sources in Israel.

System diagram:



Manufacturer's contact information: Ytong

Address: Caesarea industrial park, Caesarea, Israel

Phone Number: +972-4-637-7984

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Website: https://www.ytong.co.il

Name and contact information of the LCA practitioner: Shai Ben Aharon of KVS, shai@kvs.co.il.

Assumptions:

- Assumptions were made regarding the transportation for all materials required for manufacturing and packaging of the product. The calculation was distance based.
- Generic data of larger areas have been used for some materials and processes inputs.
- The datasets of raw materials with EPDs were modeled directly based on the EPD results in order to increase the environmental impact accuracy but it is also a limitation in the interpretation stage due to lack of information about the sources of some environmental contributors.
- Assumptions regarding the model of each module are explained in pages 6-8 of the declaration
- The packaging relative amount per declared unit was calculated based on the data provided by the EPD owner and the reuse scenario descrived in pages 6-8.
- As the production of the blocks includes chemical reaction of the constituents and a change in the density between the input density and the output density the calculations were made on the total solids basis.

- Infrastructure and capital goods were not taken into account in the primary data as they were assumed to be neglected and it is a common practice in LCA studies. In addition, it was included in the background database.

Allocations: In this study, as per EN 15804:2012+A2:2019/AC:2021, allocation is conducted in the following order:

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Overall and in general, allocations were avoided in the project as there are no by products in the manufacturing process. Nevertheless, allocations were made in the general energy usage calculation.

Allocation used in Ecoinvent 3.10 environmental data sources follows the methodology 'cut-off, EN15804' approach. This methodology is in line with the requirements of the EN 15804:2012+A2:2019/AC:2021 standard.

Cut-off rules: The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019/AC:2021 and the applied PCR 2019:14 Construction Products (version 1.3.4) of the International EPD® System. The study does not exclude any hazardous materials or substances. During the life cycle of the product, no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product. The study includes all major raw materials and energy consumption. All inputs and outputs of the unit processes with available data are included in the calculation. There is no neglected unit process of more than 1% of total mass or energy flows.

Background Database: The EPD is based on the primary production data of Ytong. The background database is Ecoinvent database v3.10 (2023). Since there are several missing datasets for Israel, background data for larger areas in which Israel is included in was used for a small part of the life cycle inventory. The electricity mix of the high voltage electricity grid according to 2023 data is given by a formal report from the Israel Electricity Authority.

The electricity mix of high voltage electricity grid according to 2023 data is given by a formal report from the Israel Electricity Authority, and is as follows: 17% of hard coal, 70.6% of natural gas, 11.8% of renewable and 0.65% of oil and other.

Electricity mix (2023)	**kg CO_2-eq/kWh**
Israel's electricity grid – 100%	0.56

The water grid is modeled according to the water sources in Israel, Meron et al (2020).

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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	IL, EUR, Global	IL, EUR, Global	IL	IL	IL	-	-	-	-	-	-	-	IL	IL	IL	IL	IL
Specific data used	80%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	2%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

Module A1 – Raw material supply: The declared Ytong blocks consists mostly of cement, sand, lime and gypsum. The raw materials supply includes raw material extraction/production that are taken into account in this study. The raw materials of packaging i.e., wood pallets and polyethylene are also included in this module.
Module A2 – Transport: The raw materials are extracted or produced in Europe and Israel. Accordingly, transport distances relatively short and are done by ships and trucks.
Module A3 – Manufacturing: The manufacturing includes the mixing of raw materials with water, Curing and drying of the blocks. Electricity, natural gas and diesel are consumed during the manufacturing process, in addition to maintenance procedures.
Module A4 – Transport: Transportation distance of distribution is estimated as 80 km by a 16-32 tonne lorry, from Ytong's factories to the building sites in Israel.

Scenario information	**Unit per declared unit**
Vehicle type	Lorry, 16-32 metric tons, euro 6 fuel type
Capacity utilization	50% (empty returns)
Distance	80 km

Module A5 – Construction installation: This module consists the blocks installation. The blocks are assembled manually, using plaster to paste the blocks.

At the end-of-life the packaging is assumed to be landfilled, and the wood pallet is also assumed to be recycled and incinerated.

Scenario information	Unit per declared unit (kg/m^3 product)
Ytong plaster for installation	7
Water for plaster	7
Waste treatment of packaging – landfill	LDPE – 0.26 Wood pallet – 2.40
Waste treatment of packaging – Recycling	LDPE – 0.04 Wood pallet – 2.40
Waste treatment of packaging – Incineration	LDPE – 0.07 Wood pallet – 1.20

End-of-Life stage (C1-C4):
The scenarios included are currently in use and are representative for one of the most probable alternatives.

Module C1 – De-construction demolition: Demolition of Ytong blocks takes place with the whole demolition of the building/construction. Thus, it is assumed that energy used for the demolition of the walls is allocated to the blocks. An estimated time of 2 seconds is considered for the demolishing of 1 kg of block.
At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as mixed construction waste.
Module C2 – Transportation: Transportation distance to the closest disposal area is estimated as 50 km by a 16-32 tonne lorry, which is the most common.
Module C3 – Waste processing: According to interviews with industry executives that manage the construction waste in Israel (GREENMIX, Negevecology), and research on the waste sector in Israel, there is processing and recycling of aluminium, but there is no recycling of the glass. According to a report of the Knesset (the Israeli Parliament) from 2022, named "Treatment of Construction Waste in Israel - Data and Points of Discussion" in Hebrew (Page 9, Table 3), 85% of the construction waste is recycled. The mineral construction waste is commonly recycled to bedding aggregated products used for infrastructure and thus the dataset was modeled to fit this assumption. For the waste processing, an energy consumption of 0.01 kWh of electricity/kg of waste input was calculated.
Module C4 – Disposal: it is assumed and modeled that 15% of the block will be landfilled.

Processes	Type	Amount per 1 kg of declared unit
Collection process	Kg collected separately	0
	Kg collected with mixed construction waste	1
Transport	Transport to disposal waste treatment plant with Euro 6, 16-32 tonne lorry for 50 km	0.05 tkm
Processing energy	Processing facility energy use	0.01 kwh
Recovery specified by type	Kg for recycling	0.85
Disposal	landfilled	0.15

Resource Recovery stage (D):

Module D – Reuse-Recovery-Recycling potential: Module D calculates the potential environmental benefits of the recycling or reuse of materials. 85% of the product is assumed to be recycled to bedding aggregated products used for infrastructures of roads, sidewalks, etc. The calculations of this module were according to Annex D in EN 15804:2012+A2:2019/AC:2021.

Data quality information - share of specific data (in GWP-GHG results):

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG. Results for A1-A3
Production of cement	Collected data	EPD of manufacturers	2022	Primary data	62%
Production of other raw materials	Database	Ecoinvent v3.10	2023	Representative secondary data	0%
Production of packaging	Database	Ecoinvent v3.10	2023	Representative secondary data, Proxy data	0%
Transport	Database	Ecoinvent v3.10	2023	Primary data	4%
Energy resources (other than electricity used in the manufacturing facility)	Database	Ecoinvent v3.10	2023	Primary data	7%
Generation of electricity used in manufacturing of product	Database	Israel Electricity Authority	2023	Primary data	8%
Total share of primary data, of GWP – GHG results for A1-A3					80%

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CONTENT INFORMATION

The content presented below is on a dry basis:

Product components	Weight, %	Post-consumer material, weight, %	Biogenic material, kg C/kg
Cement	30-60	0	0
Silica sand	20-40	0	0
Lime	5-20	0	0
Gypsum	0-10	0	0
Aluminium powder	<0.5	0	0
TOTAL	100	0	0
Packaging materials	**Weight, kg per declared unit**	**Post-consumer material, weight, kg per declared unit**	**Weight biogenic carbon, kg C per declared unit**
Nylon cover	0.37	0	0
Wood pallet	5.99	0	2.55
TOTAL	6.36	0	2.55

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ENVIRONMENTAL INFORMATION

The EPD is for a specific product produced in two sites - Environmental impacts of 1 m^3 of Block Ytong isolation panel / Ytong for Ceilings.
The results presented are the average of two manufacturing sites: Pardes Hana and Ashkelon, in Israel, based on annual production quantities.

Potential environmental impact [1,2] – mandatory indicators according to EN 15804

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	1.94E+02	8.51E+00	1.79E+00	1.08E+00	2.68E+00	1.61E+00	1.28E+00	-4.95E+00
GWP-biogenic	kg CO_2 eq.	-9.27E+00	5.74E-03	1.87E+00	1.15E-04	5.17E-05	-2.27E-03	2.21E+01	-7.90E-03
GWP-luluc	kg CO_2 eq.	1.27E-01	2.83E-03	3.37E-04	9.28E-05	1.09E-03	1.23E-04	2.68E-03	-1.91E-03
GWP-total	kg CO_2 eq.	1.85E+02	8.52E+00	3.66E+00	1.08E+00	2.68E+00	1.61E+00	2.34E+01	-4.96E+00
ODP	kg CFC 11 eq.	4.96E-06	1.69E-07	6.65E-08	1.63E-08	3.97E-08	7.16E-08	2.01E-08	-6.27E-08
AP	mol H^+ eq.	4.42E-01	1.77E-02	4.13E-03	5.58E-03	6.15E-03	7.01E-03	6.78E-03	-1.29E-02
EP-freshwater	kg P eq.	2.95E-03	6.64E-05	2.23E-05	3.75E-06	2.49E-05	3.24E-05	1.51E-05	-2.43E-05
EP-marine	kg N eq.	4.34E-02	4.15E-03	1.15E-03	2.50E-03	1.39E-03	1.08E-03	2.67E-03	-4.39E-03
EP-terrestrial	mol N eq.	1.40E+00	4.59E-02	1.35E-02	2.74E-02	1.54E-02	1.18E-02	2.87E-02	-5.43E-02
POCP	kg NMVOC eq.	3.96E-01	2.95E-02	3.98E-03	8.82E-03	8.61E-03	3.35E-03	9.46E-03	-2.49E-02
ADP-minerals &metals[3]	kg Sb eq.	1.50E-04	2.77E-05	1.78E-06	3.72E-07	8.75E-06	4.66E-06	3.23E-06	-1.79E-05
ADP-fossil[3]	MJ	1.37E+03	1.20E+02	6.93E+00	1.40E+01	3.77E+01	2.27E+01	1.77E+01	-6.80E+01
WDP[3]	m^3	2.83E+01	6.74E-01	5.83E-01	4.09E-02	2.13E-01	1.63E-01	4.27E-01	-1.02E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Ozone depletion potential; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, aquatic freshwater; EP-marine = Eutrophication potential, aquatic marine; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Photochemical ozone creation potential; ADP-minerals & metals = Abiotic depletion potential for minerals and metals (non-fossil resources) ; ADP-fossil = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential								

Disclaimer:
1: The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
2: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
3: It is discouraged to use the results of module A1-A3 without considering the results of module C.

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Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	1.94E+02	8.51E+00	1.79E+00	1.08E+00	2.68E+00	1.61E+00	1.28E+00	-4.95E+00

Use of resources[2]

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2.00E+02	2.05E+00	2.22E+00	8.54E-02	5.02E-01	1.47E+00	3.02E-01	-7.34E-01
PERM	MJ	7.47E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.74E+02	2.05E+00	2.22E+00	8.54E-02	5.02E-01	1.47E+00	3.02E-01	-7.34E-01
PENRE	MJ	1.35E+03	1.20E+02	6.93E+00	1.40E+01	3.77E+01	2.27E+01	1.77E+01	-6.80E+01
PENRM	MJ	1.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.37E+03	1.20E+02	6.93E+00	1.40E+01	3.77E+01	2.27E+01	1.77E+01	-6.80E+01
SM	kg	8.85E+00	5.55E-02	3.42E-03	5.80E-03	1.71E-02	2.36E-03	1.91E-02	-4.31E-02
RSF	MJ	2.20E+01	7.02E-04	7.77E-03	1.52E-05	2.19E-04	2.86E-05	2.30E-04	-4.19E-04
NRSF	MJ	6.76E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	7.00E-01	1.66E-02	1.45E-02	9.98E-04	5.19E-03	3.89E-03	1.01E-02	-2.37E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

[2] The primary energy use indicators were calculated according to the PCR 2019:14 v1.3.4 Annex C option B.

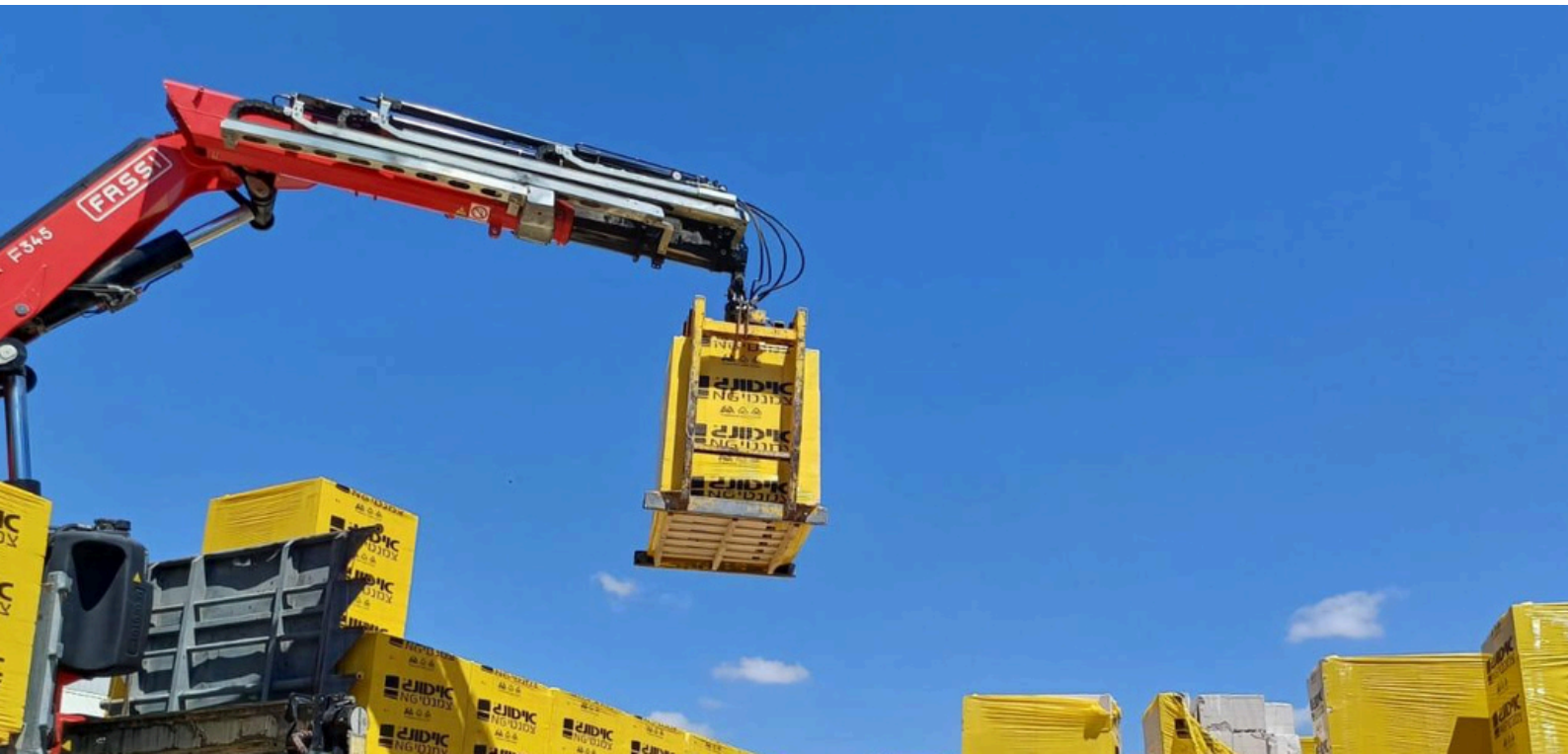
Waste production and output flows

Waste production

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5.67E+01	1.75E-01	3.52E-02	1.56E-02	6.65E-02	8.66E-02	1.41E-01	-4.95E+00
Non-hazardous waste disposed	kg	4.69E+01	3.69E+00	3.66E+00	2.13E-01	1.25E+00	1.37E+00	6.61E+01	-7.90E-03
Radioactive waste disposed	kg	4.39E-04	3.86E-05	1.63E-05	1.53E-06	7.67E-06	1.01E-06	4.28E-06	-1.91E-03

Output flows

Results per declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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 for recycling	kg	4.63E-02	9.10E-04	2.07E-04	3.77E-05	2.81E-04	2.38E+02	1.49E-04	-4.41E-05
Materials for energy recovery	kg	1.24E-04	7.71E-06	6.69E-06	1.91E-07	2.47E-06	3.79E-07	1.09E-06	-2.15E-06
Exported energy, electricity	MJ	6.92E-02	2.06E-02	1.04E-02	6.32E-04	2.78E-03	5.38E-04	1.66E-03	-1.78E-02
Exported energy, thermal	MJ	1.76E-01	2.98E-02	1.45E-02	3.33E-04	5.62E-03	8.92E-04	2.21E-03	-9.80E-02



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