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Environmental Product Declaration

Agrocrete®

GreenJams

by **GreenJams**

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-06876
Publication date:	2022-10-21
Valid until:	2027-10-20

Content

1. Introduction

GreenJams is an award-winning clean-tech enterprise working to remove 10% of global carbon dioxide emissions. The company's flagship innovation **Agrocrete® is a building material made of crop residues and by-products from steel and power plants.** This mix is moulded into blocks (solid or hollow) that can replace conventional clay bricks, fly ash bricks and others. This replacement leads to a 50% cheaper cost of construction and 3x higher thermal insulation.

GreenJams has also garnered considerable media and industry presence, having won several accolades, including Forbes 30 under 30 Asia, Meaningful Business 100, and Finalists of National Startup Awards 2020. GreenJams is also supported by the Ministry of Agriculture and Farmers' Welfare, the Ministry of Housing and Urban Affairs, the Department of Science and Mass Challenge Switzerland, Villgro, Habitat for Humanity, Punjab Agricultural University, and ICAR-NAARM.

2. General information

Programme information

Program	The International EPD® System, Indian Regional Hub http://www.environdec.com http://www.environdecindia.com
Programme Operator	EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden
Declaration Holder	**GreenJams** 401, 10-5-14/c, Mantis, Facor Layout, Ramnagar, Visakhapatnam, Andhra Pradesh, India Pin Code: 530002
Product	**Agrocrete® (Moulded mix)** Agrocrete® is a vegetal concrete mix developed by GreenJams. The mixture is comprised of crop residues and a slag-based mineral binder. It is moulded into solid and hollow blocks of various sizes.
CPC Code	37520
EPD Registration Number	S-P-06876
Publication Date	2022-10-21
Validity Date	2027-10-20
Geographical Scope	India
Reference Standards	ISO 14020:2001, ISO 14025:2006, EN 15804:2012+A2:2019

PCR Information

Reference PCR	PCR 2019:14 - 'Construction products' Version 1.11, 2019
Date of Issue	2021-02-05
PCR Reviewer	Claudia A. Peña The Technical Committee of the International EPD® System

Verification information

Type of Verification	External independent verification
Third-Party Verifier	Sunil Kumar C S Chakra4 Sustainability Consulting Services Ivory 501, HM World City 9th Phase, J P Nagar Bengaluru, Karnataka - 560108 Email: sunilkumar@chakra4.in

LCA information

Title	Environmental Product Declaration of Agrocrete Blocks
Preparer	Mili Jain, Monk Spaces HR-123/6, Pul Pehlad Pur, New Delhi – 110044 Email: mili@monkspaces.com
Reference Standards	ISO 14040/44 EN 15804:2012+A2:2019

Reference period of EPD data

The reference period for the primary data (foreground data) used within this EPD is from Nov 2020 to Aug 2022. The background data used in the study have been applied through the Ecoinvent v3.6 datasets.

Geographical scope of EPD application

The geographical scope of this EPD is India.

Additional information about EPD

This EPD provides information for the Agrocrete blocks (solid and hollow) manufactured at GreenJam's plant in Vishakhapatnam. The Life Cycle Assessment (LCA) study carried out for developing this EPD for the products is done per ISO 14040 and ISO 14044 requirements. The EPD follows ISO 14025, EN 15804+A2 and PCR 2019:14. The EPD of construction products may not be comparable if they do not comply with the same references. The target audience includes GreenJams management, operational and marketing departments. Furthermore, it can be made available for external applications, including customers, policymakers, LCA practitioners and academia. This sharing may be done per the company's decision to share information as it deems appropriate.

3. Product description and system boundaries

Product identification and usage - Agrocrete® mix (moulded)

Description	Agrocrete® is a vegetal concrete mix developed using crop residues and a slag-based mineral binder. This mix is moulded into solid and hollow blocks of various sizes. These blocks are called Agrocrete® Blocks. The results indicated are for the moulded Agrocrete mix.
Manufacturing Location	Thanam Village, Parawada Mandal, Visakhapatnam, Andhra Pradesh, India Pin Code – 531021
Usage	Agrocrete blocks can be used as a replacement for bricks for internal or external walls.

Process description

The manufacturing process for the Agrocrete® mix begins with collecting and transporting all raw materials to the plant in Vishakhapatnam. The raw materials include paddy straw from farmers and industrial by-products like fly ash and grounded slags. At the plant, the collected crop residue or straw is processed with water to achieve a uniform moisture content. Parallelly, a slag-based mineral binder is formed using alkali salts. Once complete, the processed straw and fly ash are mixed with the binder to form the Agrocrete® mix. This mix is then moulded into solid and hollow blocks of various sizes. The LCA results in the next section of this document provide information for these moulded blocks made of the Agrocrete® mix.

Content information

The product does not contain any substances that can be included in “Candidate List of Substances of Very High Concern for Authorization”.

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Straw	0.09	0%	9%
Fly ash	0.35	35%	0%
Grounded slags	0.17	17%	0%
Alkali salts	0.02	0%	0%
Water	0.37	0%	0%
TOTAL	**1.00**	**52%**	**9%**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Material 1*	0.00	0%	
TOTAL	**0.00**		
*The product requires no packaging.			

System boundary

Functional unit – 1 kg of moulded Agrocrete mix

The system boundary for this analysis has been defined as per requirements of PCR 2019:14 - 'Construction products' Version 1.11, 2019. The scenarios assumed for end of life processes (C1-C4) are based on existing EPDs, typical industry practice and are the most likely alternatives.

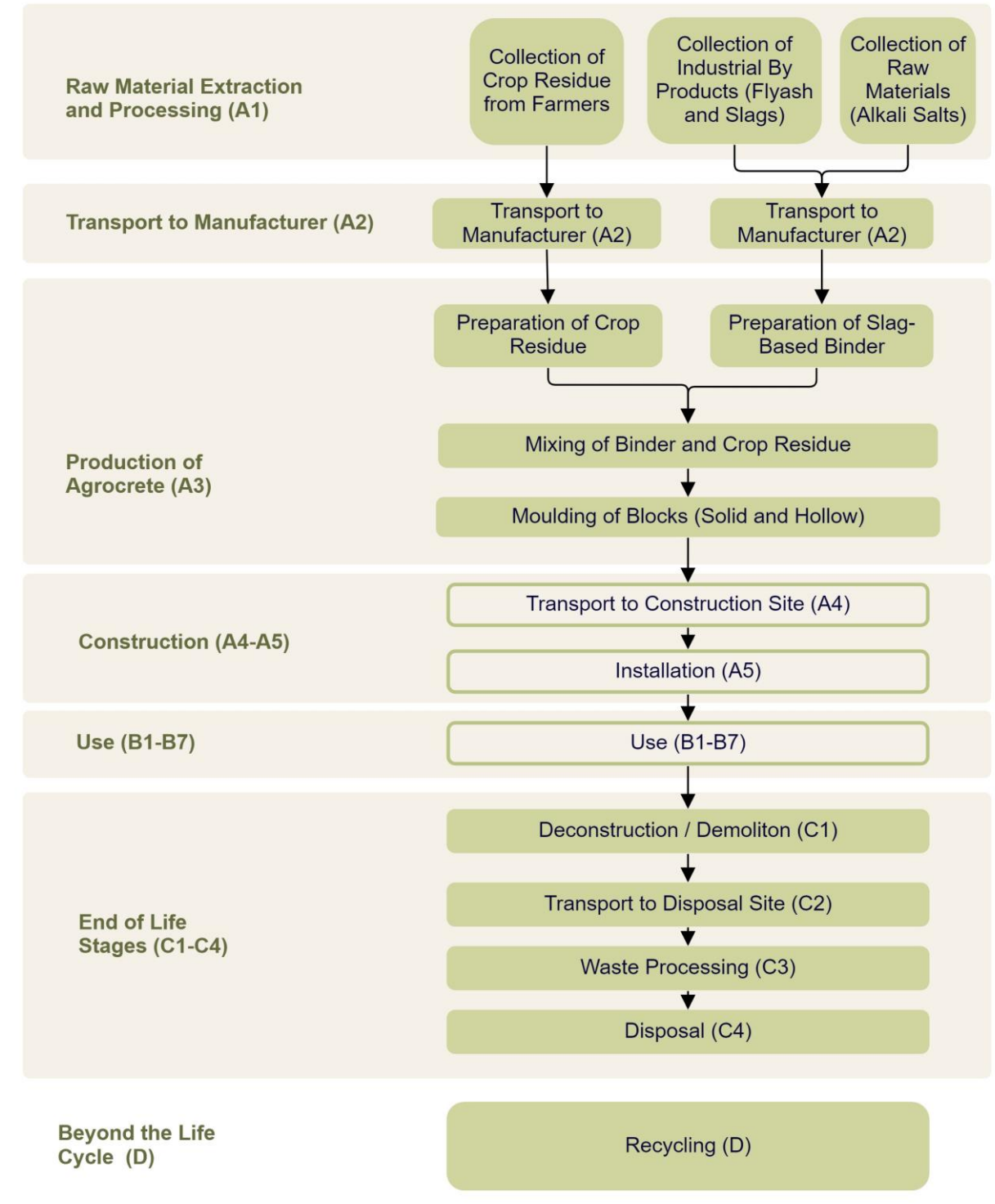
Stage	Module	Description
Product	**A1**	Module A1 indicates the extraction, collection and production of raw materials required for Agrocrete.
	A2	Transporting raw materials to the manufacturing unit in Vishakhapatnam constitutes module A2.
	A3	All activities at the manufacturing unit in Vishakhapatnam fall under module A3.
End-of-Life Processes	**C1**	The demolition or deconstruction of an Agrocrete block wall can have multiple methods (manual/mechanical). To avoid dependency, this has been considered to be 0.
	C2	With a collection rate of 95%, the demolished blocks are expected to be taken to a recycling facility within 50km. The other 5% is projected to be lost during demolition.
	C3	Out of the demolished blocks, 85% will undergo waste processing at a recycling facility.
	C4	Material not getting recycled is considered for landfill. Therefore, 10% of the installed blocks are expected to be disposed of at a landfill.
Beyond Life Cycle	**D**	The use of straw in Agrocrete helps avoid that stubble burning. The benefits quantified as 'D' are the emissions from this burning that are avoided because of use in Agrocrete.

Modules declared

Stage	Product			Construction		Use							End-of-life				Beyond life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy	Operational water	Deconstruction	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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	X	X	X	X	X
Geography	IN			-	-	-	-	-	-	-	-	-	IN				IN
Specific data used	>95%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<2%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

MNA = Module not assessed

System diagram



Legend

Included

Excluded

4. Life cycle assessment (LCA)

Information sources and data quality

The quality of the LCI data for modelling the life cycle stages has been assessed according to ISO 14040:2006. Data quality is judged by its precision, completeness, consistency and representativeness. The quality of the data used in the models was maintained to ensure the accuracy and representativeness of the moulded Agrocrete mix. Primary data collected using metering of the manufacturing unit was used for the study. For upstream processes, the Ecoinvent 3.6 database was used with India-specific datasets. The calculation was conducted on the One Click LCA software.

Cut off rules

Criteria for excluding inputs and outputs (cut-off rules) in the LCA, information modules and any additional information are intended to support an efficient calculation procedure. The cut-off model is based on the recycled content or cut-off approach. In this system model, wastes are the producer's responsibility ("polluter pays"), and there is an incentive to use recyclable products that are available burden-free ("cut-off"). The cut-off law excludes irrelevant flows of material or energy from system boundaries.

Cut-off criteria were set out in the original study for recording material flows and avoiding the need to pursue trivial inputs/outputs in the system. These are outlined below:

- Mass – The alkali salts are brought to the factory in packages of 50kg. As per EN 15804:A2, the cut-off rule indicates that materials that contribute up to 1% of impacts can be excluded if the total exclusions do not exceed 5%. The bag's weight was estimated to be an extra 0.0032% of the raw materials (as shown in the table below). Since this is less than 1% and is the only material not included in the assessment, these PP bags are cut off from the evaluation. All other raw materials in the product have been considered for the assessment. For this product, the straw used is an agri-waste product and is available burden-free.

	Quantity	Unit
PP bag capacity	50.000	kg
Weight of each PP bag	100.000	gms
Weight of bag per kg of material it carries	0.002	kg
Material procured in PP bag per kg of moulded agrocrete (alkali salts)	0.017	kg
Total weight of PP bag required per kg of moulded agrocrete	0.000034	kg
Total raw material required per kg of moulded agrocrete	1.082	kg
Weight of PP bags in comparison to the weight of raw materials	0.0032%	

- Energy – This assessment has accounted for all fuel and electrical consumptions.
- Environmental Significance – Environmental significance has been accounted for in terms of the mass and energy outputs.

Allocation

Since allocation cannot be avoided, the inputs and outputs of the system have been partitioned between its different products. The electricity consumption of the boiler and pan mixer is not expected to vary for the different types of blocks. However, the hydraulic machine may require less or more electricity based on the moulded block's size and configuration (hollow or solid). This manufacturing unit's electricity

consumption (A3) could not be partitioned for the outputs (hollow and solid blocks). The composition by weight of both blocks is the same. Therefore, there is no need for allocation for any other raw material. The difference lies in how they are moulded. Accordingly, the electrical inputs are allocated by the weight of the blocks. Therefore, the results indicate the environmental impact of a moulded Agrocrete mix, irrespective of the size and configuration of the block moulded.

End of life (C1-C4)

A masonry wall can be demolished in multiple ways, like manual demolition, light machinery, or heavy bulldozers. The impacts during demolition (C1) have been taken to be zero to avoid necessitating the use of one method. It is estimated that demolition may lead to the collection of 95% of the blocks. The other 5% is expected to be lost during demolition. Of the total collected blocks, 85% are proposed to be taken to a waste processing facility where the demolished blocks can be processed to be recycled into aggregate or paver blocks. The remaining blocks are projected to be disposed of at a landfill. The landfill and waste processing facilities are expected to be within 50kms of the site. The assumption for end-of-life scenarios are per practice established by existing EPDs like S-P-04326 and S-P-02112.

Beyond system boundary (D)

The straw used in the Agrocrete mix is collected from farmers around the manufacturing unit. This straw is crop residue and, essentially, waste material for the farmers. Unless bought by GreenJams, the straw is burnt off to make way for the next crop. This burning leads to direct emissions and soil erosion without trapping any usable heat or energy. These avoided emissions are quantified as module 'D' attributing to benefits for Agrocrete.

LCIA categories

The environmental impact per functional unit (kg) for the following environmental impact categories was reported in the next section as per EN15804+A2:2019.

Environmental Impact Indicators for EN15804+A2:2019		
Impact Category	**Indicator**	**Unit**
Climate change – total	Global warming potential total (GWP-total)	kg CO_2 eq
Climate change - fossil	Global warming potential fossil fuels (GWP-fossil)	kg CO_2 eq
Climate change - biogenic	Global warming potential biogenic (GWP-biogenic)	kg CO_2 eq
Climate change - luluc	Global warming potential land use & land use change (GWP-luluc)	kg CO_2 eq
Ozone Depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC-11e
Acidification	Acidification potential, accumulated exceedance (AP)	mol H+ eq.
Eutrophication aquatic freshwater	Eutrophication potential, the fraction of nutrients reaching freshwater end compartment kg PO4 eq. (EP-freshwater)	kg PO_4 eq
Eutrophication aquatic marine	Eutrophication potential, the fraction of nutrients reaching marine end compartment (EP-marine)	kg N eq
Eutrophication terrestrial	Eutrophication potential, accumulated exceedance (EP-terrestrial)	mol N eq.
Photochemical ozone formation	Photochemical oxidants creation potential (POCP)	kg NMVOC eq
Depletion of abiotic resources - minerals and metals	Abiotic depletion potential for non-fossil resources (ADP- minerals & metals)	kg Sb eq

Depletion of abiotic resources - fossil fuels	Abiotic depletion of fossil resources potential (ADP-fossil)	MJ
Water use	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	m^3

Natural Resource Use Parameters		
Parameter	**Acronym**	**Unit**
Renewable primary energy as an energy carrier	PERE	MJ
Renewable primary energy resources as material utilisation	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Non-renewable primary energy as an energy carrier	PENRE	MJ
Non-renewable primary energy as material utilisation	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net freshwater use	FW	m^3

Waste Categories Parameters		
Parameter	**Acronym**	**Unit**
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg

Output Flows		
Parameter	**Acronym**	**Unit**
Components for reuse	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported electrical energy	EEE	MJ
Exported thermal energy	EET	MJ

Biogenic Carbon	
Parameter	**Unit**
Biogenic carbon content in the product	kg C
Biogenic carbon content in the packaging	kg C

5. Environmental information

Potential environmental impact – mandatory indicators (EN 15804)

Results per functional unit (1 kg of moulded Agrocrete mix)										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	-1.90E-01	5.00E-03	4.20E-02	-1.43E-01	0.00E+00	4.30E-03	4.80E-03	5.30E-04	-1.80E-02
GWP-fossil	kg CO_2 eq.	2.60E-01	5.00E-03	4.20E-02	3.07E-01	0.00E+00	4.30E-03	4.80E-03	5.30E-04	1.50E-02
GWP-biogenic	kg CO_2 eq.	-4.40E-01	2.90E-06	6.40E-04	-4.39E-01	0.00E+00	3.10E-06	1.30E-06	1.00E-06	-3.30E-02
GWP-luluc	kg CO_2 eq.	1.40E-04	1.70E-06	2.10E-06	1.44E-04	0.00E+00	1.30E-06	4.00E-07	1.60E-07	1.80E-05
ODP	kg CFC 11 eq.	8.30E-09	1.10E-09	4.30E-10	9.83E-09	0.00E+00	1.00E-09	1.00E-09	2.20E-10	7.60E-10
AP	mol H^+ eq.	1.00E-03	2.70E-05	4.30E-04	1.46E-03	0.00E+00	1.80E-05	5.00E-05	5.00E-06	5.00E-04
EP-freshwater	kg PO_4^{3-} eq.	7.30E-06	4.50E-08	2.50E-06	9.85E-06	0.00E+00	3.50E-08	1.90E-08	6.40E-09	7.00E-06
EP-freshwater	kg P eq.	3.20E-04	9.30E-06	5.30E-05	3.82E-04	0.00E+00	5.50E-06	2.20E-05	1.70E-06	3.00E-04
EP-marine	kg N eq.	3.10E-03	1.00E-04	6.10E-04	3.81E-03	0.00E+00	6.00E-05	2.40E-04	1.90E-05	1.50E-03
EP-terrestrial	mol N eq.	7.20E-04	3.00E-05	1.60E-04	9.10E-04	0.00E+00	1.90E-05	6.60E-05	5.50E-06	6.60E-05
POCP	kg NMVOC eq.	1.90E-06	1.10E-07	7.20E-08	2.08E-06	0.00E+00	7.40E-08	7.30E-09	4.80E-09	2.20E-07
ADP-minerals&metals*	kg Sb eq.	1.60E+00	7.70E-02	4.40E-01	2.12E+00	0.00E+00	6.70E-02	6.60E-02	1.50E-02	1.30E-01
ADP-fossil*	MJ	6.80E-02	2.90E-04	1.50E-02	8.33E-02	0.00E+00	2.50E-04	1.20E-04	6.80E-04	1.50E-02
WDP	m^3	-1.90E-01	5.00E-03	4.20E-02	-1.43E-01	0.00E+00	4.30E-03	4.80E-03	5.30E-04	-1.80E-02
Acronyms		GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Photochemical Oxidants Creation Potential; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption								

Potential environmental impact – additional mandatory indicators (EN 15804)

Results per functional or declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	2.60E-01	5.00E-03	4.20E-02	3.07E-01	0.00E+00	4.30E-03	4.80E-03	5.30E-04	1.50E-02
The indicator includes all greenhouse gases in GWP-total. However, it excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.										

Use of resources

Results per functional or declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4.90E-02	9.10E-04	4.10E-02	9.09E-02	0.00E+00	8.50E-04	3.50E-04	1.20E-04	3.90E-01
PERM	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
PERT	MJ	4.90E-02	9.10E-04	4.10E-02	9.09E-02	0.00E+00	8.50E-04	3.50E-04	1.20E-04	3.90E-01
PENRE	MJ	1.60E+00	7.70E-02	4.40E-01	2.12E+00	0.00E+00	6.70E-02	6.60E-02	1.50E-02	1.30E-01
PENRM	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
PENRT	MJ	1.60E+00	7.70E-02	4.40E-01	2.12E+00	0.00E+00	6.70E-02	6.60E-02	1.50E-02	1.30E-01
SM	kg	1.10E-04	0.00E+00	0.00E+00	1.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.10E-03	1.50E-05	3.20E-04	1.44E-03	0.00E+00	1.40E-05	5.80E-06	1.60E-05	1.60E-03
Acronyms	PERE = use of primary renewable 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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = use of net fresh water									

Waste production

Results per functional or declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	6.30E-03	8.50E-05	2.40E-03	8.79E-03	0.00E+00	6.50E-05	0.00E+00	1.40E-05	7.90E-04
Non-hazardous waste disposed	kg	2.60E-01	7.10E-03	1.10E-01	3.77E-01	0.00E+00	7.20E-03	0.00E+00	1.00E-01	2.50E-02
Radioactive waste disposed	kg	3.60E-06	5.20E-07	5.70E-07	4.69E-06	0.00E+00	4.60E-07	0.00E+00	9.70E-08	4.10E-07
Water disposed	m^3	1.98E-04	2.70E-06	5.76E-05	2.58E-04	0.00E+00	2.52E-06	1.04E-06	2.88E-06	2.88E-04

Output flows

Results per functional or declared unit										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Total A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
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	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.50E-01	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	0.00E+00
Exported energy, electricity	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
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

Biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**Quantity**
Biogenic carbon content in the product	kg C	-1.61E+00
Biogenic carbon content in packaging	kg C	0.00E+00

6. Interpretation

Global Warming Potential (GWP)	The cradle-to-gate GWP of the moulded Agrocrete mix is -0.14 kgCO_2e / kg of a block. This negative value is due to the biogenic carbon stored in the product due to the straw. This value can calculate the GWP of any block made from this mix if its weight is known. If biogenic carbon is not considered, the GWP-GHG was equal to 0.30 kgCO2e / kg. Regarding the materials used in the product, flyash alone is responsible for 85% of the GWP-fossil emissions.
Ozone Depletion Potential (ODP)	The ODP during A1-A3 is 9.87e-9 kg CFC-11eq / kg of block. The biggest contributor to this is the raw material collection during module A1. As in the case of GWP-fossil, flyash is the most significant contributor (75%) to the product's ODP. The second most crucial contributor here is the alkali salts at 18%.
Acidification Potential (AP)	The acidification potential during cradle-to-gate processes is limited to 1.50e-03 mol H^+ eq/kg of a block. 86% of this acidification potential is due to the flyash and grounded slags.
Eutrophication Potential (EP)	Eutrophication potential is the ability to cause the over-fertilisation of ecosystems. Eutrophication potential is highest for terrestrial ecosystems at 3.82e-03 mol N eq during A1-A3. Marine ecosystems face a lower risk at 3.85e-04 kg N eq, and freshwater ecosystems are at the least risk with a potential of 9.87e-06 kg P eq.
Photochemical Oxidants Creation Potential (POCP)	The POCP scale quantifies the ability of volatile organic compounds (VOCs) to produce ground-level ozone. The cradle-to-gate POCP is 9.07e-04 kg NMVOC eq/kg. The share of the flyash, grounded slags and alkali salts for POCP is 85%, 6% and 7%, respectively.
Abiotic Depletion Potential (ADP)	The ADP for minerals and metals is 2.05e-06 kg Sb eq/kg. This value includes a 48% share of alkali salts and a 45% share of flyash. The ADP for fossils is 2.12 MJ / kg. Three-fourths of the ADP-fossil fuels are due to the flyash.
Water Depletion Potential (WDP)	The WDP of the blocks during A1-A3 is 8.34e-02 m^3/kg of moulded Agrocrete mix. However, 18% of this water is recollected and used for agriculture on the adjacent lands. This reuse was not modelled in the LCA.

7. References

- EPD. General Programme Instructions of the international EPD® system. Version 4.0
- EN 15804: 2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- ISO 14020:2000 Environmental labels and declarations - General principles
- ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- ISO 14040:2006 Environmental management- Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
- ISO/TR 14049:2012 Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis.