ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

G40 PCC V1
Integrated Precast Solutions Pte Ltd

EPD HUB, HUB-5806
Published on 24.03.2026, last updated on 24.03.2026, valid until 24.03.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Integrated Precast Solutions Pte Ltd
Address	9 Defu South Street 1, Singapore 533844/ Lot 900 & 901, Jalan Perdana, Off Jalan Ulu Pulai, Jeram Batu, 81500 Pekan Nanas, Johor, Malaysia/ Lot 902 & 903, Jalan Perdana, Off Jalan Ulu Pulai, Jeram Batu, 81500 Pekan Nanas, Johor, Malaysia
Contact details	hslim@ipspl.com.sg
Website	https://www.ipspl.com.sg/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Benjamin Tan, ESGpedia
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Afzal khan Peerukhan as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

The primary reason for performing this LCA and developing the EPD is to fulfil the requirements of the Singapore Green Building Council (SGBC) New Certification Scheme with EPD.

PRODUCT

Product name	G40 PCC V1
Additional labels	NA
Product reference	-
Place(s) of raw material origin	Singapore, Johor Bahru (Malaysia)
Place of production	Singapore, Johor Bahru (Malaysia)
Place(s) of installation and use	Singapore
Period for data	Calendar Year 2024
Averaging in EPD	Based on Average Production of G40 PCC V1 in Multiple Factories
Variation in GWP-fossil for A1-A3 (%)	+2.43 / −2,43
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	14,9

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 cubic meter of G40 PCC V1
Declared unit mass	2357 kg
Mass of packaging	0 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	279
GWP-total, A1-A3 ($kgCO_2e$)	280
Secondary material, inputs (%)	0,55
Secondary material, outputs (%)	99
Total energy use, A1-A3 (kWh)	559
Net freshwater use, A1-A3 (m^3)	1,24

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Integrated Precast Solutions Pte Ltd (IPS) is a manufacturer of structural precast concrete components and a member of the Teambuild Construction Group. The company is recognised as a pioneer in advanced precast technologies such as PPVC, PBU, and conventional precast systems, operating from Teambuild's Integrated Construction and Prefabrication Hub (ICPH). IPS holds ISO 9001:2015 and ISO 14001:2015 certifications and is registered with BCA as a Specialist Builder for pre-cast concrete work.

PRODUCT DESCRIPTION

The G40 S4 (PCC) Green Concrete Design Mix is a high-performance, sustainable concrete designed in accordance with SS EN 206 and SS 544 for structural applications requiring both strength and durability. Engineered to meet Strength Class C32/40 with a target mean strength of 40 N/mm², the mix incorporates OPC, GGBS, and silica fume to reduce embodied carbon while improving long-term performance. Its S4 consistency class with a slump range of 160–210 mm provides excellent workability, making it suitable for precast components, reinforced structural elements, and areas with congested rebar. With a water-cement ratio of 0.45, DC-1 exposure class, Cl ≤ 0.10, and a concrete density of 2357 kg/m³, this mix offers enhanced durability, low permeability, and reliable performance in demanding construction environments, supported by high-range superplasticiser MGA 8537 for optimal flow and placement efficiency.

Further information can be found at:
https://www.ipspl.com.sg/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	-	-
Minerals	99,78	Malaysia
Fossil materials	0,22	Malaysia, Singapore
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 cubic meter of G40 PCC V1
Mass per declared unit	2357 kg
Functional unit	NA
Reference service life	NA

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The manufacturing process of the G40 S4 (PCC) Green Concrete Design Mix begins with the delivery and secure storage of all raw materials—OPC cement, GGBS, silica fume, fine and coarse aggregates, water, and superplasticizers—in sealed silos, bins, and dedicated containers to preserve material quality. Aggregates are accurately weighed and transferred into the batching mixer, followed by the addition of cementitious materials for a controlled dry mixing phase. Water and the MGA 8537 superplasticizer are then introduced for wet mixing, ensuring the mix achieves its required S4 workability and uniformity.

Once fully blended, the fresh concrete is discharged and poured into precast moulds, where it is compacted, cured, and shaped into various structural components according to project specifications. These precast elements are then demoulded, quality-checked, and transported to construction sites for installation, ensuring consistent performance and durability throughout the building process.

Production losses during the manufacturing process are assumed to be zero. In accordance with the established production workflow, all concrete waste generated on site is fully collected, crushed, and recycled as Recycled Concrete Aggregate (RCA) for use in subsequent production cycles. No concrete waste is disposed of. The only material sent for final disposal is the small quantity of mould-release lubricating oil used during casting. For this fraction, a transport distance of 45 km to the nearest incineration facility is assumed.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as 48 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account. Transportation does not cause losses as product are loaded properly. Also, volume capacity utilisation factor is assumed to be 100 % for the nested product. There are no installation losses and does not generate waste during installation.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

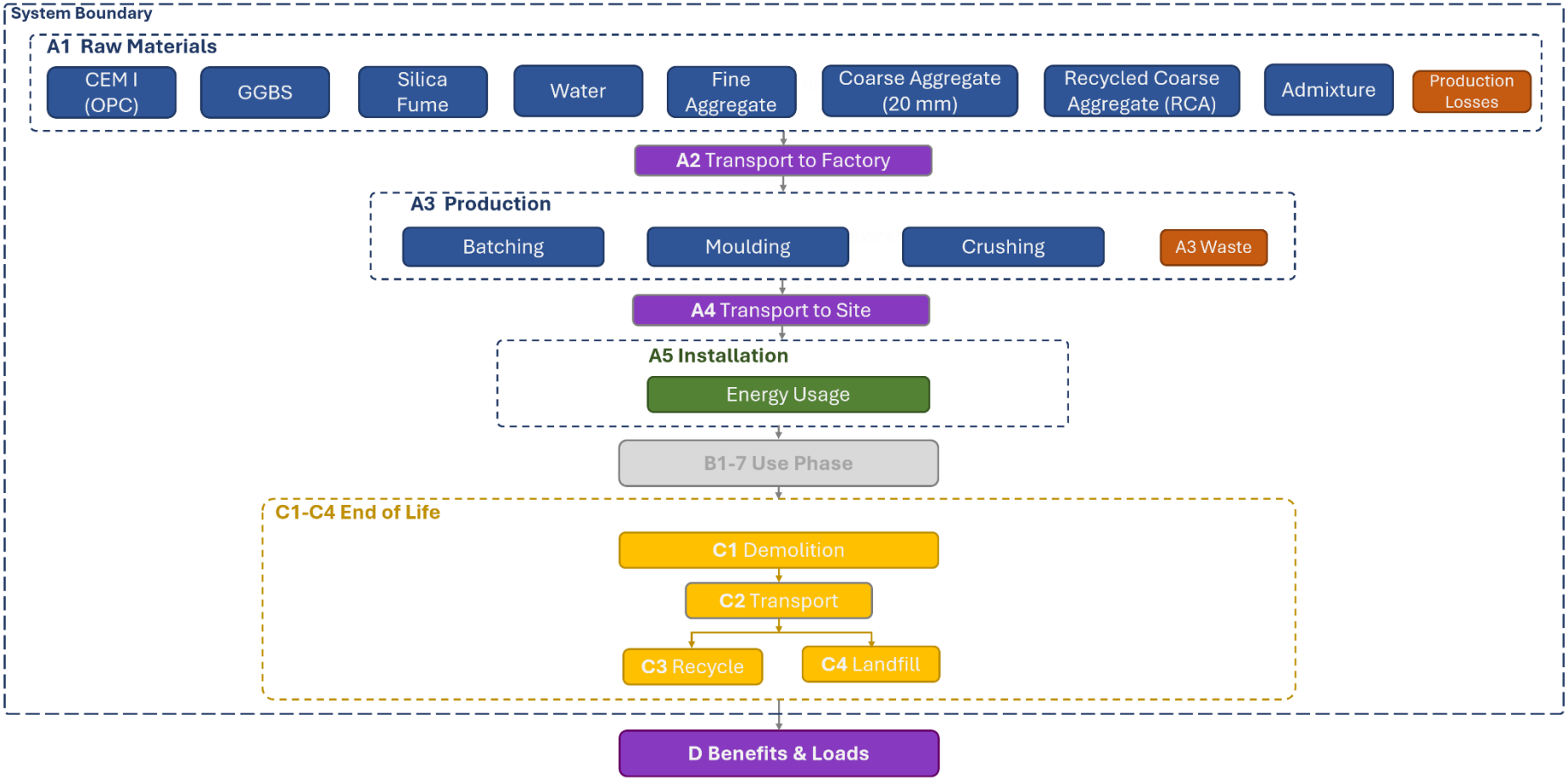
PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste. The demolition process consumes energy in the form of diesel fuel used by building machines. Energy consumption of a demolition process is on the average 10 kWh/m2 (Bozdağ, Ö & Seçer, M. 2007). Basing on a Level(s) project, an average mass of a reinforced concrete building is about 1000 kg/m2. Therefore, energy consumption demolition is assumed to be 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines (C1).

The demolished concrete pieces are delivered to the nearest construction waste treatment plant. It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight with the declared product. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common.

At the waste treatment plant, waste that can be reused, recycled or recovered for energy is separated and diverted for further use. It can be assumed that 100% of the concrete blocks are transported to a waste treatment plant, where the blocks are crushed and separated. About 99% of concrete (NEA, 2023) is recycled. The process losses of the waste treatment plant are assumed to be negligible (C3). The remaining 1% of concrete are assumed to be sent to the landfill (C4).

SYSTEM DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Not applicable
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

Production losses consist mainly of small concrete residues. These are fully collected, crushed on-site, and reused as Recycled Concrete Aggregate (RCA), resulting in 100% recovery of concrete waste.

No packaging is used for the precast elements. Products are transported to clients by lorry and secured directly on the vehicle without additional materials or product loss.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple factories
Grouping method	Based on average results of product group - by total mass
Variation in GWP-fossil for A1-A3, %	+2,43 / −2,43

This EPD is declared as a single product manufactured at two production sites located in Singapore and Malaysia. These sites are grouped together on the basis of having the same supply chain, identical mix design, and comparable production technology. Results are averaged by production mass across the two sites.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

This EPD references the EPD Hub Core PCR Version 1.2 (24 March 2025), which defines the applicable product category rules, system boundaries, and data quality requirements used throughout this assessment.

This EPD also references national waste-management data published by the National Environment Agency of Singapore, available at: https://www.nea.gov.sg/docs/default-source/default-document-library/waste-and-recycling-statistics-2014-to-2023.pdf

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,38E+02	3,47E+01	7,36E+00	2,80E+02	1,21E+01	8,50E+00	ND	ND	ND	ND	ND	ND	ND	8,50E+00	1,27E+01	1,02E+01	1,47E-01	2,27E+01
GWP – fossil	kg CO_2e	2,37E+02	3,47E+01	7,36E+00	2,79E+02	1,21E+01	8,50E+00	ND	ND	ND	ND	ND	ND	ND	8,50E+00	1,27E+01	1,02E+01	1,47E-01	2,26E+01
GWP – biogenic	kg CO_2e	1,88E-01	7,86E-03	2,71E-03	1,99E-01	2,77E-03	8,67E-04	ND	ND	ND	ND	ND	ND	ND	8,67E-04	2,87E-03	-1,04E-03	-4,68E-05	2,16E-02
GWP – LULUC	kg CO_2e	6,42E-02	1,55E-02	1,27E-03	8,10E-02	5,47E-03	8,71E-04	ND	ND	ND	ND	ND	ND	ND	8,71E-04	5,68E-03	1,05E-03	8,41E-05	2,05E-02
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,19E-06	5,12E-07	5,63E-07	2,26E-06	1,89E-07	1,30E-07	ND	ND	ND	ND	ND	ND	ND	1,30E-07	1,87E-07	1,56E-07	4,26E-09	1,84E-07
Acidification potential	mol H^+e	7,86E-01	1,18E-01	2,58E-02	9,30E-01	5,03E-02	7,67E-02	ND	ND	ND	ND	ND	ND	ND	7,67E-02	4,33E-02	9,22E-02	1,04E-03	1,39E-01
EP-freshwater[2)]	kg Pe	2,76E-02	2,70E-03	6,43E-04	3,09E-02	9,41E-04	2,45E-04	ND	ND	ND	ND	ND	ND	ND	2,45E-04	9,88E-04	2,95E-04	1,21E-05	7,09E-03
EP-marine	kg Ne	2,08E-01	3,89E-02	5,82E-03	2,52E-01	1,83E-02	3,56E-02	ND	ND	ND	ND	ND	ND	ND	3,56E-02	1,42E-02	4,28E-02	3,98E-04	3,30E-02
EP-terrestrial	mol Ne	2,33E+00	4,23E-01	6,18E-02	2,82E+00	2,00E-01	3,90E-01	ND	ND	ND	ND	ND	ND	ND	3,90E-01	1,55E-01	4,68E-01	4,34E-03	4,01E-01
POCP ("smog")[3)]	kg NMVOCe	6,62E-01	1,74E-01	1,91E-02	8,56E-01	7,31E-02	1,16E-01	ND	ND	ND	ND	ND	ND	ND	1,16E-01	6,38E-02	1,40E-01	1,56E-03	1,11E-01
ADP-minerals & metals[4)]	kg Sbe	1,23E-03	9,68E-05	1,62E-06	1,32E-03	3,39E-05	3,05E-06	ND	ND	ND	ND	ND	ND	ND	3,05E-06	3,54E-05	3,66E-06	2,34E-07	1,25E-04
ADP-fossil resources	MJ	1,35E+03	5,03E+02	1,03E+02	1,96E+03	1,76E+02	1,11E+02	ND	ND	ND	ND	ND	ND	ND	1,11E+02	1,84E+02	1,34E+02	3,61E+00	2,78E+02
Water use[5)]	m^3e depr.	3,83E+01	2,49E+00	9,62E+01	1,37E+02	8,71E-01	2,78E-01	ND	ND	ND	ND	ND	ND	ND	2,78E-01	9,09E-01	3,34E-01	1,04E-02	3,50E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	8,29E-06	3,47E-06	4,81E-08	1,18E-05	1,24E-06	2,18E-06	ND	ND	ND	ND	ND	ND	ND	2,18E-06	1,27E-06	2,00E-05	2,37E-08	2,12E-06
Ionizing radiation[6)]	kBq U235e	3,67E+00	4,38E-01	8,35E-02	4,19E+00	1,53E-01	4,93E-02	ND	ND	ND	ND	ND	ND	ND	4,93E-02	1,60E-01	5,92E-02	2,27E-03	2,20E+00
Ecotoxicity (freshwater)	CTUe	6,29E+02	7,12E+01	7,18E+00	7,08E+02	2,48E+01	6,12E+00	ND	ND	ND	ND	ND	ND	ND	6,12E+00	2,60E+01	7,35E+00	3,03E-01	6,54E+01
Human toxicity, cancer	CTUh	4,64E-08	5,73E-09	2,36E-10	5,24E-08	2,00E-09	8,74E-10	ND	ND	ND	ND	ND	ND	ND	8,74E-10	2,09E-09	1,05E-09	2,71E-11	6,20E-09
Human tox. non-cancer	CTUh	1,56E-06	3,26E-07	1,90E-08	1,91E-06	1,14E-07	1,38E-08	ND	ND	ND	ND	ND	ND	ND	1,38E-08	1,19E-07	1,66E-08	6,23E-10	1,80E-07
SQP[7)]	-	2,61E+03	5,07E+02	2,43E+00	3,12E+03	1,78E+02	7,79E+00	ND	ND	ND	ND	ND	ND	ND	7,79E+00	1,85E+02	9,36E+00	7,11E+00	2,62E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	8,21E+01	6,90E+00	4,49E+00	9,35E+01	2,42E+00	7,04E-01	ND	ND	ND	ND	ND	ND	ND	7,04E-01	2,52E+00	8,46E-01	3,49E-02	2,66E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	8,21E+01	6,90E+00	4,49E+00	9,35E+01	2,42E+00	7,04E-01	ND	ND	ND	ND	ND	ND	ND	7,04E-01	2,52E+00	8,46E-01	3,49E-02	2,66E+01
Non-re. PER as energy	MJ	1,32E+03	5,03E+02	9,79E+01	1,92E+03	1,76E+02	1,11E+02	ND	ND	ND	ND	ND	ND	ND	1,11E+02	1,84E+02	1,34E+02	3,61E+00	2,78E+02
Non-re. PER as material	MJ	1,57E+01	0,00E+00	0,00E+00	1,57E+01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,55E+01	-1,57E-01	0,00E+00
Total use of non-re. PER	MJ	1,33E+03	5,03E+02	9,79E+01	1,94E+03	1,76E+02	1,11E+02	ND	ND	ND	ND	ND	ND	ND	1,11E+02	1,84E+02	1,18E+02	3,45E+00	2,78E+02
Secondary materials	kg	1,30E+01	2,14E-01	9,91E-04	1,32E+01	7,50E-02	4,62E-02	ND	ND	ND	ND	ND	ND	ND	4,62E-02	7,84E-02	5,55E-02	9,08E-04	3,12E-01
Renew. secondary fuels	MJ	8,00E-03	2,72E-03	6,34E-05	1,08E-02	9,55E-04	1,21E-04	ND	ND	ND	ND	ND	ND	ND	1,21E-04	9,95E-04	1,45E-04	1,88E-05	2,15E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	1,12E+00	7,44E-02	4,24E-02	1,24E+00	2,65E-02	7,35E-03	ND	ND	ND	ND	ND	ND	ND	7,35E-03	2,72E-02	8,83E-03	3,76E-03	8,34E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	7,31E+00	8,53E-01	8,18E-03	8,17E+00	2,98E-01	1,24E-01	ND	ND	ND	ND	ND	ND	ND	1,24E-01	3,12E-01	1,49E-01	3,99E-03	2,10E+00
Non-hazardous waste	kg	1,58E+02	1,58E+01	3,84E-01	1,74E+02	5,51E+00	1,69E+00	ND	ND	ND	ND	ND	ND	ND	1,69E+00	5,77E+00	2,03E+00	9,12E-02	3,90E+01
Radioactive waste	kg	9,11E-04	1,07E-04	1,26E-05	1,03E-03	3,75E-05	1,21E-05	ND	ND	ND	ND	ND	ND	ND	1,21E-05	3,92E-05	1,45E-05	5,53E-07	5,37E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,33E+03	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	2,37E+02	3,45E+01	7,33E+00	2,79E+02	1,20E+01	8,46E+00	ND	ND	ND	ND	ND	ND	ND	8,46E+00	1,26E+01	1,02E+01	1,46E-01	2,25E+01
Ozone depletion Pot.	kg CFC_{-11}e	1,01E-06	4,09E-07	4,95E-07	1,92E-06	1,50E-07	1,03E-07	ND	ND	ND	ND	ND	ND	ND	1,03E-07	1,49E-07	1,24E-07	3,38E-09	1,55E-07
Acidification	kg SO_2e	6,00E-01	9,03E-02	2,11E-02	7,12E-01	3,76E-02	5,40E-02	ND	ND	ND	ND	ND	ND	ND	5,40E-02	3,30E-02	6,48E-02	7,72E-04	1,08E-01
Eutrophication	kg PO_4^3e	5,51E-01	2,20E-02	4,17E-03	5,77E-01	9,21E-03	1,26E-02	ND	ND	ND	ND	ND	ND	ND	1,26E-02	8,05E-03	1,51E-02	2,45E-04	2,12E-02
POCP (“smog”)	kg C_2H_4e	4,11E-02	8,05E-03	9,32E-04	5,00E-02	3,15E-03	4,04E-03	ND	ND	ND	ND	ND	ND	ND	4,04E-03	2,94E-03	4,86E-03	7,30E-05	9,61E-03
ADP-elements	kg Sbe	8,40E-04	9,44E-05	1,60E-06	9,36E-04	3,31E-05	2,96E-06	ND	ND	ND	ND	ND	ND	ND	2,96E-06	3,45E-05	3,56E-06	2,29E-07	1,23E-04
ADP-fossil	MJ	1,29E+03	4,97E+02	1,03E+02	1,89E+03	1,74E+02	1,10E+02	ND	ND	ND	ND	ND	ND	ND	1,10E+02	1,82E+02	1,33E+02	3,57E+00	2,42E+02

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2,37E+02	3,47E+01	7,36E+00	2,79E+02	1,21E+01	8,50E+00	ND	ND	ND	ND	ND	ND	ND	8,50E+00	1,27E+01	1,02E+01	1,47E-01	2,26E+01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Electricity, Malaysia, 2023, Malaysia, One Click LCA, 0.84 kgCO2e/kWh
2. Electricity, Singapore, 2023, Singapore, One Click LCA, 0.74 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, lorry >32 metric ton, EURO4, 48 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50
Bulk density of transported products	2,36E+03
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)

1. Diesel, burned in building machine, Ecoinvent, 23.58 kWh

End-of-life scenario documentation - C1-C4 (Data source)

1. Diesel, burned in building machine, Ecoinvent, 23.58 kWh
2. Treatment of waste concrete, inert material landfill, Ecoinvent, 23.57 kg
3. Treatment of waste concrete, not reinforced, recycling, Ecoinvent, Materials for recycling, 2333.43 kg

Scenario information	Value
Scenario assumptions e.g. transportation	End-of-life transportation has been conservatively assumed as 50km by truck

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Afzal khan Peerukhan as an authorized verifier for EPD Hub Limited 24.03.2026

VERIFIED ISO 14025