READY MIX CONCRETE

Environmental Product Declaration

Attica

Programme The International EPD® System
Programme operator EPD International AB
EPD registration number S-P-04981
Publication date 2021-12-06
Revision date 2022-10-11
Valid until 2027-10-11

C16/20 - 16mm	C16/20 - 31.5mm	C20/25 - 16mm
C20/25 - 31.5mm	C25/30 - 16mm	C25/30 - 31.5mm
C25/30 - 31.5mm SEASIDE	C25/30 - 31.5mm WATERPROOF	C30/37 - 16mm
C30/37 - 31.5mm	C30/37 - 31.5mm SEASIDE	C30/37 - 31.5mm WATERPROOF
C35/45 - 31.5mm	C40/50 - 31.5mm	PILES [C20/25, C25/30, C30/37]

in accordance with ISO 14025 and EN 15804:2012+A2:2019

EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD EN 15804 VERIFIED

LAFARGE

COMPANY INFORMATION

Lafarge, a member of HERACLES Group, holds a strong presence in the Greek construction sector since 2001. Based on its significant know-how in concrete, innovative products of high aesthetics, strictest quality control procedures and advanced technical support services, it has established itself as a trusted partner for its clients.

With a current network of 16 ready mix concrete units and 6 quarries, Lafarge offers a wide range of state of the art products and value-added solutions that cover a wide spectrum of needs for every modern construction.

Besides the supply of high standards structural concrete conforming to the Hellenic Concrete Technology Regulation 2016 (KTS 2016), Lafarge provides differentiated products & solutions, such as:

SPECIAL CONCRETES
CREATING THE UNEXPECTED

• **Special Concretes**, a series of advanced concrete solutions suited for projects of high aesthetics and architectural interest. The Special Concretes comprise of Agilia (self-placing & self-levelling concrete), Artevia (decorative architecture series of concrete), Hydromedia (water permeable concrete) and Ultra series of products, tailor made to address custom needs.

ECOPact
The Green Concrete

• **ECOPact series** of concrete achieves 30% less carbon emissions compared to standard (CEM I) concrete. This is made feasible by utilizing low CO_2 cement together with advanced technology chemical admixtures. Lafarge is committed to contributing to achieving the net zero pledge undertaken by our parent company, Holcim Group, on a global level.

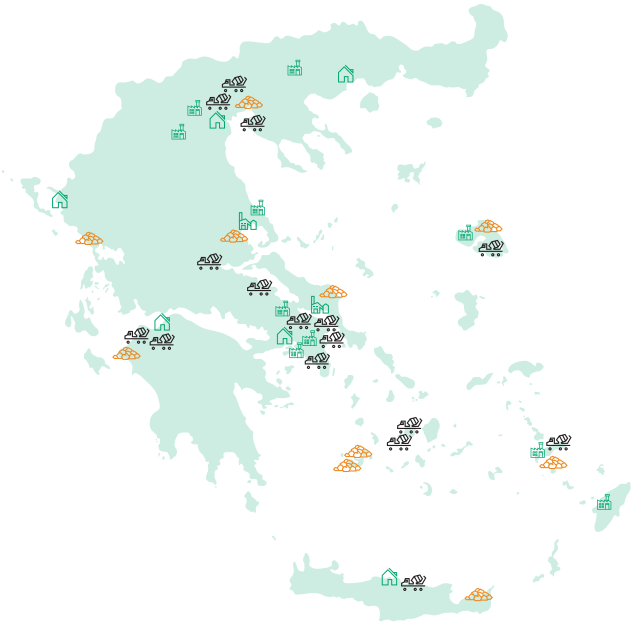
LAFARGE

• **"Lafarge 24/7"** is a mobile app that offers Lafarge customers an easy way to place concrete orders and keeps them informed about their status, in real time! This is a 24/7 available service, allowing an order request on any day and time.

HERACLES Group of Companies

HERACLES Group of Companies, a member of Holcim Group, is the leader in the building materials sector in Greece, having 110 years of presence in the market. With a network of 30 production and commercial facilities throughout Greece, the Company is active in the production and marketing of cement, aggregates, concrete and industrial minerals, offering products and solutions that meet the diversified needs of customers and all requirements of modern sustainable construction.

At HERACLES Group, Sustainable Development is a long-term commitment and a non-negotiable priority that guides our daily business activity. We believe in building a greener and more sustainable world for people and the planet, a world that operates with respect for water and nature and upgrades the quality of life for all. We advocate an innovative, climate-neutral construction industry that applies the principles of circular economy regarding the use of resources. To this end, we focus on four strategic pillars for sustainable development - Local Communities, Climate & Energy, Circular Economy, Nature – to create added value for our business, our stakeholders, the local communities and the environment.



5 Companies

2 Cement plants

20 Types of cement

10 Third Party bag depots

12 Ports

16 Ready-Mix concrete plants

3.500 Customers

10 Quarries

6 Distribution centers

LAFARGE

SCOPE

The scope of this EPD includes the concrete batching plants of Attica area and more specifically the following units: RMX-Metamorfosi, RMX-Koropi, RMX-Rafina, RMX-Gerakas and RMX-Aspropyrgos. The analysis is based on full year 2020 information regarding consumption of raw materials, electrical power, water, chemical admixtures and generated wastes.

This is an average product EPD for multiple ready-mix concrete products conforming to the requirements of KTS 2016. According to PCR 2019, maximum accepted variance is ±10% in the GWP-GHG indicator when grouping manufacturing sites and/or product groups. The Concrete Product categories included in this EPD are shown in the table below and their analysis is based on the weighted average of the corresponding mix designs to each category. The mix designs are shown by the company's ERP codification and fulfil the maximum accepted variance of ±10%.

Concrete Product Category	Exposure classes	ERP concrete mix designs
C16/20-16mm	X0	16082370(1), 16082413(1), 16072664(1)
C16/20-31.5mm	X0	16082371(1), 16082414(1), 16082412(1), 16071864(1)
C20/25-16mm	XC1, XC2	16082335(1), 16072662(1), 16082416(1), 16082445(1), 16082395(1), 16072663(1), 16082378(1)
C20/25-31.5mm	XC1, XC2	16082337(1), 16072661(1), 16082415(1), 16082336(1), 16082390(1), 16082394(1), 16071863(1), 16082376(1), 16078014(1), 16082444(1), 16082334(1), 16082339(1)
C25/30-16mm	XC1, XC2, XC3	16035302, 16035398, 16035399, 16035515, 16058378, 16062700, 16082410(1), 16082470(1), 16072665(1), 16073103(1)
C25/30-31.5mm	XC1, XC2, XC3	16035406, 16035407, 16043529, 16049568, 16053791, 16053795, 16061947, 16066122, 16067472, 16073905(1), 16082447(1), 16071862(1), 16075094(1), 16073104(1)
C25/30-31.5mm-SEASIDE	XS1, XS2	16048224, 16072667(1)
C25/30-31.5mm-WATERPROOF	XC1, XC2, XC3	16035332, 16035333, 16035509, 16053891, 16060725, 16062781, 16063666, 16066868, 16072873(1), 16073765(1)
C30/37-16mm	XC1, XC2, XC3, XC4	16035308, 16035324, 16035381, 16035507, 16035516, 16057515
C30/37-31.5mm	XC4, XD1, XF1, XF4, XA1	16035387, 16035392, 16035489, 16035510, 16048825, 16053981, 16055322, 16063512, 16064441, 16068324
C30/37-31.5mm-SEASIDE	XS1, XS2, XS3	16053939, 16053944
C30/37-31.5mm-WATERPROOF	XC1, XC2, XC4, XS1, XS2, XS3	16035337, 16058504, 16061476, 16065428, 16066140, 16067147, 16071764
C35/45-31.5mm	XC4, XS3, XD3, XM1	16035372, 16035511, 16079133
C40/50-31.5mm	XC4, XS3, XD3, XM2	16035494
PILES (C20/25, C25/30, C30/37)	-	16035471, 16035472, 16035483, 16035488, 16035490, 16044019, 16082377(1), 16073105(1), 16072721(1), 16074649(1)

(1) ECOPact concrete mix designs

The classification criteria applied for the creation of the concrete product categories are:
- **Strength class** e.g. C16/20, C 20/25, C 25/30.
- **Maximum aggregates size** - gravel (31.5mm) and fine gravel (16mm).
- **Concrete type** - standard concrete conforming to KTS 2016 and Special Concrete Products. The latter are demonstrated at a separate EPD with no. S-P-04988 published at The International EPD® System.

The indicator "16mm" or "31.5mm" shown in the description of each concrete product indicates the maximum aggregate size used, i.e. "16mm" appears when fine gravel and sand are used, while "31.5mm" appears when gravel, fine gravel and sand are used.

ECOPact
The Green Concrete
100% strong, 30% less CO_2
The first green series of concrete with low carbon footprint

PRODUCT DESCRIPTION

Concrete is the most abundant man-made material on earth. It is the essential part of every construction independent of its size i.e. buildings, bridges, roads, dams, pavements, pipes, drains etc. It is composed of natural aggregates of different granulometries (gravel, fine gravel, sand) bonded together by hydrated cement paste. Chemical admixtures may also be added to enhance specific properties of the fresh or hardened concrete, such as workability, durability, or early and final strength. Concrete is workable right after production so that it can be transported, poured, pumped, installed, compacted on the project site and over time it hardens and develops strengths. It is delivered to the construction site via concrete mixer trucks that usually have 8 m^3 load.

Concrete Properties

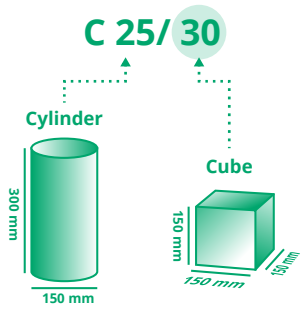
Workability

Workability is the property of fresh concrete which determines the ease or difficulty in order to be handled, transported, placed and compacted. Slump test is one of the most widely used methods for the quantification of fresh concrete workability. The associated classification depending on the slump test result is shown in the table on the right.

Slump Class	Workability	Slump test (mm)
S1	Very Low	10 – 40
S2	Low	50 – 90
S3	Medium	100 – 150
S4	High	160 – 210
S5	Very High	≥ 220

Compressive Strength

Compressive strength is one of the most important properties of the hardened concrete. It expresses concrete ability to resist loads and it is measured either in cylindrical or cubic specimens in various ages, e.g. 7 and 28 days. Depending on the compressive strength result of the 28 days specimen, concrete is classified in classes, which as per EN-206 are: C8/10, C12/15, C16/20, C20/25, C25/30, C30/37, C35/45, C40/50, C45/55, C50/60, C55/67, C60/75, C70/85, C80/95, C90/105, C100/115.



In very simple terms, C25/30 strength class corresponds to:

- 25 MPa minimum compressive strength measured in cylindrical specimen cured for 28 days
- 30 MPa minimum compressive strength measured in cubic specimen cured for 28 days

In Greece, concrete compressive strengths are usually measured in cubic specimens.

Durability

Durability is the capability of hardened concrete to resist to certain detrimental effects such as carbonation, chemical attack and abrasion while maintaining its designed technical properties. Depending on the exposure classes of Table 1, specific mix design requirements are applied in terms of minimum cement quantity, water to cement ratio, cover etc.

Average Concrete mix designs for Attica

Concrete Product Category	Cement (kg/m³)	Aggregates (kg/m³)	Admixtures (kg/m³)	Water (kg/m³)
C16/20-16mm	303	1.854	3,4	187
C16/20-31.5mm	268	1.880	2,9	175
C20/25-16mm	332	1.824	4,3	184
C20/25-31.5mm	282	1.904	3,4	168
C25/30-16mm	342	1.812	3,8	186
C25/30-31.5mm	310	1.893	3,9	172
C25/30-31.5mm-SEASIDE	327	1.862	4,1	174
C25/30-31.5mm-WATERPROOF	327	1.857	6,4	172
C30/37-16mm	354	1.806	5,1	182
C30/37-31.5mm	323	1.853	3,9	170
C30/37-31.5mm-SEASIDE	348	1.833	4,9	176
C30/37-31.5mm-WATERPROOF	325	1.858	6,5	172
C35/45-31.5mm	397	1.832	6,3	167
C40/50-31.5mm	392	1.750	4,0	169
PILES (C20/25, C25/30, C30/37)	401	1.747	4,6	188

Cement used in these mixes is supplied from HERACLES G.C.Co., which is certified in accordance with EN 197-1. The cement quality types utilized in Attica area are:

Cement type	Cement plant	CE certification no.	EPD no.*
CEM II/B-M (P-W-L) 32.5N	**Volos**	**1128-CPR-1675**	**S-P-03610**
CEM II/B-M (P-W-L) 42.5N	**Volos**	**1128-CPR-10.09.0317/05**	**S-P-03611**
CEM I 42.5R	**Milaki**	**1128-CPR-0129**	**S-P-03609**

*The International EPD® System

No substance in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" exceeds 0.1% wt in the ready-mix concrete products.

Table 1: Exposure classes according to KTS 2016

	No risk of corrosion or attack	Carbonation-induced corrosion				Sea water: Cement types II, III, IV (except CEM II/B-LL + CEM II/B-L)			Sea water: Cement I (+ CEM II/B-LL + CEM II/B-L)			Chloride other than from sea water			Freeze/ thaw attack				Aggressive chemical environments			Abrasion		
	X0	XC1	XC2	XC3	XC4	XS1	XS2	XS3	XS1	XS2	XS3	XD1	XD2	XD3	XF1	XF2	XF3	XF4	XA1	XA2	XA3	XM1	XM2	XM3
Maximum w/c	-	0,65	0,60	0,55	0,50	0,50	0,50	0,45	0,50	0,50	0,45	0,55	0,50	0,45	0,55	0,55	0,55	0,50	0,55	0,50	0,45	0,50	0,45	0,40
Min strength class	C12/15	C20/25	C25/30	C25/30	C30/37	C25/30	C25/30	C30/37	C30/37	C30/37	C35/45	C30/37	C35/45	C35/45	C30/37	C25/30	C25/30	C30/37	C30/37	C30/37	C35/45	C35/45	C40/50	C50/60
Min cement content (kg/m³)	-	280	300	300	320	330	330	350	330	330	350	330	330	350	320	300	300	320	320	340	360	320	340	360
Min cover[c] (mm)	-	25	25	35	35	45	45	50	40	40	50	35	40	50	-	-	-	-	35	35	35	-	-	-
Min air content (%)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,0 [a]	4,0 [a]	4,0 [a]	-	-	-	-	-	-
Other requirements	Unreinforced					Seaside 1.5 km	Permanent in sea	In contact with water							Aggregate in accordance with EN 12620 with sufficient freeze/thaw resistance[d]					Sulfate-resisting cement [b]		LA≤ 27	LA≤ 25	LA≤ 22

[a] Where the concrete is not air entrained, the performance of concrete should be tested according to an appropriate test method in comparison with a concrete for which freeze/thaw resistance for the relevant exposure class is proven.
[b] For exposure class (XA) the § B7.7.5 and § B7.7.6 of KTS 2016 are in force. Where sulfate in the environment leads to exposure classes XA2 and XA3, it is essential to use sulfate-resisting cement conforming to EN 197-1 or complementary national standards.
[c] The cover values concern reinforced concrete.
[d] For aggregates the § B1.3.3.3 of KTS 2016 is applicable.

LCA INFORMATION

DECLARED UNIT
The declared unit is 1 m^3 of ready-mix concrete.

GOAL AND SCOPE
This EPD evaluates the average environmental impacts of the production of 1 m^3 of ready-mix concrete of the concrete batch plants in the Attica area.

BACKGROUND DATA
The most recent version of Ecoinvent database v.3.7.1 was used as a source of background data.

SOFTWARE
The software used for the production of the LCA results is OpenLCA 1.10.3.

DATA QUALITY
ISO 14044 was applied in terms of data collection and quality requirements. Regarding the Product stage, at the module A1 (Raw Materials) the cement impacts were taken from the EPDs of HERACLES G.C.Co. published at the International EPD® System. The impact of the rest of the raw materials e.g. aggregates, water were recovered from Ecoinvent database v.3.7.1. The data concerning the modules A2 (Transportation) and A3 (Product manufacturing) were provided by Lafarge and involved the full year 2020. These data were the quantities of all input and output materials to the batching plant as extracted from the company's ERP system, the consumed utilities (energy, water) and the distances and means of transport for each input stream. Regarding electricity mix, the latest (2020) national residual electricity mix as published in DAPEEP SA was utilized.
The rest stages (Construction, Use, End of Life, Reuse/Recycle) are scenario based and are analyzed in the SYSTEM BOUNDARY section. Background data for these stages are retrieved from Ecoinvent v.3.7.1.

TIME REPRESENTIVENESS
All primary data used in this study is for the full year 2020.

GEOGRAPHICAL SCOPE
Worldwide

ALLOCATIONS
Wherever possible allocation was avoided. Allocation based on physical properties (mass) was applied to the electricity, water and wastes.

ASSUMPTIONS
• Module A2: a EURO4 lorry 16-32 metric ton was utilized for road transportation and a bulk carrier for dry goods for sea transportation.
• Module A4: the distance between concrete batch plant and construction site is considered to be 10 km.
• Module A5: the diesel consumption for the concrete truck and pump operation is considered to be 9,4 lt/m^3_{con} and the water consumption 669 lt/m^3_{con}.
• Module B1: the carbonation is calculated based on EN 16757 for a residential building with surface distribution from (Andersson et al, 2013) and service life 50 years.
• Module C1: the specific diesel consumption for a building demolition is considered 7 MJ/kg_{con} (Gervasio et al., 2018).
• Module C2: a conservative assumption of 50 km by lorry 16-32 metric ton was used.
• Module C3: The sorting and crushing of waste concrete is modelled with 3,7 kWh/tn_{con} electrical consumption, 0,51 m^3/tn_{con} excavation and 10^{-10} items of sorting facility. The recyclable concrete waste fraction is 61% w/w (ELSTAT). Carbonation in this stage was calculated for "outdoor, exposed to rain" conditions, ¼ year exposure time and 150 mm diameter of concrete granule.
• At module C4, the disposed fraction of demolition waste is considered to be 39% w/w (ELSTAT). Carbonation in this stage was calculated for "in ground" conditions, 100 years exposure time and 150 mm diameter of concrete granule.
• Regarding demolition waste, the fraction of recovered/disposed concrete waste was considered to be the same with the fraction of the recovered/disposed demolition waste.

CUT-OFF RULES
The cut-off rule for insufficient data or data gaps that are less than 1% of the total input mass and less than 5% of energy usage and mass per module was applied to the admixtures and diesel for the loader. Admixtures transportation was considered normally.

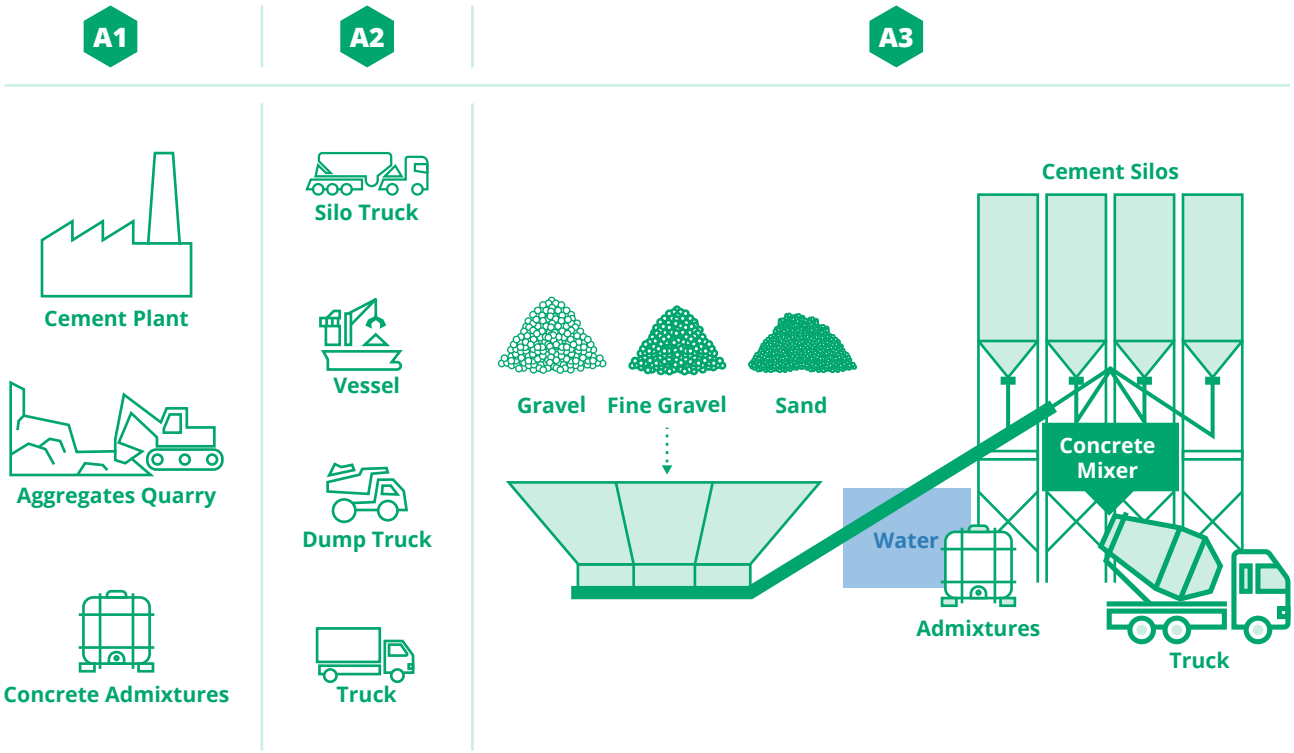
COMPARABILITY
EPDs of construction products may not be comparable if they do not comply with EN 15804. EPDs within the same product category but from different programmes may not be comparable.

SYSTEM BOUNDARY

The scope of this study is Gradle to grave and module D as analyzed here below.

X= Included, MND= Module Not Declared																
Product Stage			Construction Stage		Use Stage							End-of-life Stage				Resource Recovery
Raw Materials Supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction and demolition	Transport	Waste processing for reuse, recovery and/or recycling	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

A1-A3: Product Stage



A1: Raw Material Supply
Production starts with raw materials supply. The main raw materials for concrete production are aggregates, cement, water and concrete admixtures. This stage includes mainly the impact associated with the production of cement, water and the mining and processing of raw materials.

A2: Transportation of raw materials to manufacturer
Transport stage involves the delivery impact of raw materials from the supplier to the concrete batching plant. Cement is transported by bulk carrier vessels and silo trucks, aggregates via dump trucks and admixtures via trucks.

A3: Manufacturing
A usual concrete batching plant consists of a mixer where cement, aggregates, water and admixtures are weighted and mixed together in specific proportions to produce concrete of specific technical characteristics. Aggregates of different granulometry (gravel, fine gravel, sand) are stored in open areas and distinct piles. A loader fills the aggregates hopers from which the required quantity is retrieved and transferred to the mixer via conveyor belt. The aggregates humidity is periodically checked to adjust the amount of water added to the mixture. The cement is stored in separate silos depending on the quality type and added to the mixer via screw conveyors while the water and admixtures via pumps. After the required mixing time, the fresh concrete is loaded to the mixer truck and must be delivered within 1.0 hour and 30 minutes (under normal environmental conditions, max 2.0 hours). Quality control is performed in both raw materials and final product. Regarding the final product, the fresh concrete is tested before the dispatch in terms of temperature (max 32°C), slump class and compressive strengths (sampling based on the quality control plan).

A4-A5: Construction stage

A4: Transport
Includes the impact of the ready-mix concrete transportation from the concrete batching plant to the construction site, which is assumed to be 10 km.

A5: Construction – Installation
Concrete installation to the construction site is considered to take place via a concrete mixer truck and a concrete pump for which the diesel consumption is 8 and 23 lt/h respectively (NEED4B, D2.5). It is assumed that 16 m^3 concrete are poured during 1 hour, thus the total specific diesel consumption is 9,4 lt/m^3$_{con}$. The water consumption is assumed to be 669 lt/m^3$_{con}$ during this stage.

B1-B7: Use stage

During the use stage (B1), concrete uptakes part of the CO_2 emitted during the cement production via the concrete carbonation process. This is the reaction of CO_2 in the environment with the calcium hydroxide in the cement paste. Carbonation is a natural process, actually increasing concrete strength, however if it reaches the reinforcement, corrosion may start thus adequate cover is required (Table 1). Calculation of concrete carbonation in the Use stage (B1) is based on EN 16757.

$$U_{ttc} = w \cdot C \cdot \left(\frac{m_{CO_2}}{m_{CaO}}\right) \qquad CO_2 uptake \left(\frac{kgCO_2}{m^3 con}\right) = k \cdot \frac{\sqrt{t}}{1000} \cdot U_{ttc} \cdot C \cdot D_c$$

Where:
U_{tcc}= the maximum theoretical uptake (kg CO_2/kg cement) per cement type
w= the part of reactive CaO (kg CaO/kg binder) per cement type
C= the cement content in kg/m^3
D_c= carbonation degree as shown in table BB.1 of EN16757
k= k-factor (mm/year^{0,5}) as shown in table BB.1 of EN16757

The D_c and k-factor depend on the concrete strength and the exposure condition.

Regarding the exposure conditions, the CO_2 uptake scenario during the Use stage (B1) is based on a residential building as studied from (Andersson et al, 2013) and its service life is considered to be 50 years. The CO_2 uptake is calculated for 1 m^3 concrete and its surface distribution to the residential building is shown at the table on the right. CO_2 uptake is assumed to be zero for the surface under tiles, parquet or laminate.

Surface distribution of 1 m^3	m^2/m^3
Indoor in dry climate, with cover	4,31
Indoor in dry climate, without cover	0,80
Outdoor, exposed to rain	0,29
Outdoor, sheltered from rain	0,13
In ground	0,75
Surface under tiles, parquet or laminate	0,20

Product does not require maintenance (B2), repair (B3), replacement (B4), refurbishment (B5), operational energy use (B6) or operational water use (B7) during its Reference Service Life.

C1-C4: End of life stage

C1: Deconstruction/demolition
This stage concerns the impact arising from the diesel consumption of the heavy vehicles during demolition process. The specific diesel consumption is taken as 7 MJ/kg concrete (Gervasio et al., 2018).

C2: Transport
Includes the transportation impact during the End of Life stage. A conservative assumption of 50 km by lorry 16-32 metric ton was used.

C3: Waste processing
Involves the impact arising from the collection of waste fractions from the deconstruction site and the waste processing (e.g. sorting, crushing) of material flows intended for reuse, recycling and recovery. The sorting and crushing of concrete waste involves 3,7 kWh/tn_{con} electrical consumption, 0,51 m^3/tn_{con} excavation and 10^{-10} items of sorting facility construction according to Ecoinvent 3.7.1. After demolition, it is considered that the waste concrete is crushed into spherical particles. Carbonation may occur during the waste processing, while the product is stored and before it is been recycled. The carbonation approach analyzed in the Use stage (B1) is also applied here and is adapted to a spherical geometry that considers the radial carbonation of depth $d=k\cdot\sqrt{t}/1000$ and the available carbonation quantity according to BRE PN514. The granule size is regarded to be 150 mm, the time period for the C3 stage is ¼ year, the exposed conditions is “outdoor- exposed to rain” and the recycling rate is 61% w/w as per the latest (2018) published data of Hellenic Statistical Authority (ELSTAT).

C4: Disposal
It is the impact coming from the disposal (e.g. landfilling) of the non-recovered concrete waste. Loads (e.g. emissions) from waste disposal are considered part of the product system under study as per the “polluter pays principle”. In Greece, as mentioned, the recycling fraction of demolition waste is 61% w/w and the rest part is disposed. Since demolition waste includes different materials (e.g. concrete, steel and wood), an assumption has been taken that the fraction of disposed/recovered waste concrete is the same with the fraction of disposed/recovered demolition waste. Carbonation during the landfill stage is calculated with the same methodology applied in the C3 module. The granule size is considered to be 150 mm, the time period for the C4 module is 100 years, the exposed conditions is “in ground” and the disposed fraction is 39% w/w.

D: Reuse-Recovery-Recycling potential

Module D aims to present the environmental benefits or loads resulting from reusable products, recyclable materials and/or useful energy carriers. The considered scenario in module D is to reuse the recyclable concrete in the concrete production by substituting natural gravel. As a result, this stage depicts the difference between the impacts of recycling concrete until it reaches the end-of-waste state and the impacts of using the primary material. The substitution rate of natural gravel by recycled concrete is 1 and the recyclable concrete in the mix design is considered to be 30% w/w since higher ratio may affect the desirable product characteristics. It must be noticed, that the scenario D is currently not widely applicable in Greece since KTS 2016 requires only the use of natural aggregates in the concrete production.

ENVIRONMENTAL PERFORMANCE INDICATORS

C16/20-16mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1,94E+02	3,87E+00	8,57E+00	-1,24E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	8,61E-01	-5,18E+00	-4,53E-01
GWP-fossil	kg CO_2 eq	1,94E+02	3,86E+00	8,57E+00	-1,24E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	8,46E-01	-5,18E+00	-4,56E-01
GWP-biogenic	kg CO_2 eq	5,42E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,47E-03	6,51E-03	1,04E-02	2,70E-03	1,78E-03
GWP-luluc	kg CO_2 eq	2,46E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,19E-03	6,55E-03	4,10E-03	1,30E-03	1,13E-03
GWP-GHG[1]	kg CO_2 eq	1,93E+02	3,83E+00	1,24E+00	-1,24E+01	0	0	0	0	0	0	4,93E-01	1,91E+01	8,12E-01	-5,28E+00	-4,18E-01
ODP	kg CFC-11 eq	1,15E-05	8,84E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,24E-06	4,42E-06	2,51E-07	1,98E-06	-1,99E-07
AP	mol H^+ eq	6,00E-01	1,94E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,57E-01	9,68E-02	1,87E-02	4,54E-02	-3,12E-02
EP-freshwater	kg PO_4^{-3} eq	8,08E-02	8,02E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,01E-03	1,09E-02	1,38E-03	4,59E-03
EP-freshwater[2]	kg P eq	2,63E-02	2,62E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,54E-04	1,31E-03	3,55E-03	4,49E-04	1,50E-03
EP-marine	kg N eq	2,08E-01	6,75E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,95E-02	3,38E-02	4,18E-03	1,58E-02	-1,21E-02
EP-terrestrial	mol N eq	2,38E+00	7,38E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,61E-01	3,69E-01	3,82E-02	1,73E-01	-1,77E-01
POCP	kg NMVOCeq	5,78E-01	2,10E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,03E-02	-3,71E-02
ADPe[3]	kg Sb eq	1,57E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,07E-06	7,02E-05	6,79E-06	1,07E-05	-4,32E-06
ADPf[3]	MJ	1,04E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,94E+02	5,39E+01	1,35E+02	2,05E+00
WDP[3]	m^3 eq	4,16E+01	2,74E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,49E+01	1,37E+00	1,49E+00	6,19E+00	-1,81E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	9,86E+01	7,94E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,66E+00	1,08E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	9,86E+01	7,94E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,66E+00	1,08E+00	1,96E+00
PENRE	MJ	1,04E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,94E+02	5,39E+01	1,35E+02	2,04E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,04E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,94E+02	5,39E+01	1,35E+02	2,04E+00
SM	kg	1,49E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,26E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	7,44E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,37E+00	6,34E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,17E-02	3,43E-02	1,46E-01	-4,23E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	9,54E-04	1,53E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,57E-04	7,67E-04	3,65E-05	1,99E-04	-4,52E-05
NHWD	kg	9,78E+00	2,82E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,54E-01	1,41E+01	1,72E-01	9,15E+02	-1,21E-02
RWD	kg	5,51E-03	4,03E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,02E-03	3,14E-04	8,85E-04	5,83E-06
CRU	kg	1,16E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,87E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C16/20-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1,75E+02	3,83E+00	8,57E+00	-1,10E+01	0	0	0	0	0	0	1,49E+01	1,91E+01	1,08E+00	-4,09E+00	-4,48E-01
GWP-fossil	kg CO_2 eq	1,75E+02	3,82E+00	8,57E+00	-1,10E+01	0	0	0	0	0	0	1,49E+01	1,91E+01	1,07E+00	-4,09E+00	-4,51E-01
GWP-biogenic	kg CO_2 eq	5,05E-02	1,29E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,45E-03	6,45E-03	1,03E-02	2,67E-03	1,76E-03
GWP-luluc	kg CO_2 eq	2,30E-02	1,30E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,18E-03	6,49E-03	4,06E-03	1,29E-03	1,12E-03
GWP-GHG[1]	kg CO_2 eq	1,74E+02	3,79E+00	1,24E+00	-1,10E+01	0	0	0	0	0	0	4,89E-01	1,90E+01	1,03E+00	-4,19E+00	-4,13E-01
ODP	kg CFC-11 eq	1,07E-05	8,76E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,21E-06	4,38E-06	2,49E-07	1,96E-06	-1,97E-07
AP	mol H^+ eq	5,55E-01	1,92E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,55E-01	9,58E-02	1,85E-02	4,49E-02	-3,09E-02
EP-freshwater	kg PO_4^{-3} eq	7,31E-02	7,94E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,38E-03	3,97E-03	1,08E-02	1,36E-03	4,55E-03
EP-freshwater[2]	kg P eq	2,38E-02	2,59E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,50E-04	1,30E-03	3,51E-03	4,44E-04	1,48E-03
EP-marine	kg N eq	1,92E-01	6,69E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,88E-02	3,34E-02	4,14E-03	1,57E-02	-1,20E-02
EP-terrestrial	mol N eq	2,20E+00	7,31E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,54E-01	3,65E-01	3,78E-02	1,72E-01	-1,75E-01
POCP	kg NMVOCeq	5,36E-01	2,08E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,07E-01	1,04E-01	1,07E-02	4,98E-02	-3,68E-02
ADPe[3]	kg Sb eq	1,48E-04	1,39E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,02E-06	6,95E-05	6,72E-06	1,06E-05	-4,28E-06
ADPf[3]	MJ	9,65E+02	5,83E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,05E+02	2,92E+02	5,34E+01	1,33E+02	2,03E+00
WDP[3]	m^3 eq	4,06E+01	2,71E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,47E+01	1,35E+00	1,47E+00	6,13E+00	-1,79E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	8,85E+01	7,86E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,06E+00	3,93E+00	6,60E+00	1,07E+00	1,94E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	8,85E+01	7,86E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,06E+00	3,93E+00	6,60E+00	1,07E+00	1,94E+00
PENRE	MJ	9,60E+02	5,83E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,05E+02	2,92E+02	5,34E+01	1,33E+02	2,02E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	9,60E+02	5,83E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,05E+02	2,92E+02	5,34E+01	1,33E+02	2,02E+00
SM	kg	1,31E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	5,59E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,53E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,37E+00	6,28E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,14E-02	3,14E-02	3,40E-02	1,45E-01	-4,19E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	9,41E-04	1,52E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,52E-04	7,60E-04	3,62E-05	1,97E-04	-4,48E-05
NHWD	kg	1,01E+01	2,80E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,52E-01	1,40E+01	1,70E-01	9,06E+02	-1,20E-02
RWD	kg	5,13E-03	3,99E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,42E-03	2,00E-03	3,11E-04	8,76E-04	5,77E-06
CRU	kg	1,10E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,89E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C20/25-16mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,14E+02	3,86E+00	8,57E+00	-1,37E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	6,34E-01	-6,20E+00	-4,52E-01
GWP-fossil	kg CO_2 eq	2,14E+02	3,86E+00	8,57E+00	-1,37E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	6,19E-01	-6,20E+00	-4,55E-01
GWP-biogenic	kg CO_2 eq	5,87E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,47E-03	6,50E-03	1,04E-02	2,69E-03	1,77E-03
GWP-luluc	kg CO_2 eq	2,71E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,19E-03	6,54E-03	4,09E-03	1,30E-03	1,13E-03
GWP-GHG[1]	kg CO_2 eq	2,13E+02	3,82E+00	1,24E+00	-1,37E+01	0	0	0	0	0	0	4,93E-01	1,91E+01	5,85E-01	-6,30E+00	-4,17E-01
ODP	kg CFC-11 eq	1,28E-05	8,83E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,24E-06	4,41E-06	2,51E-07	1,98E-06	-1,99E-07
AP	mol H^+ eq	6,53E-01	1,93E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,56E-01	9,66E-02	1,86E-02	4,53E-02	-3,12E-02
EP-freshwater	kg PO_4^{-3} eq	8,90E-02	8,01E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,00E-03	1,09E-02	1,37E-03	4,58E-03
EP-freshwater[2]	kg P eq	2,90E-02	2,61E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,53E-04	1,31E-03	3,54E-03	4,48E-04	1,49E-03
EP-marine	kg N eq	2,26E-01	6,74E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,94E-02	3,37E-02	4,18E-03	1,58E-02	-1,21E-02
EP-terrestrial	mol N eq	2,57E+00	7,36E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,60E-01	3,68E-01	3,82E-02	1,73E-01	-1,77E-01
POCP	kg NMVOCeq	6,27E-01	2,10E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,02E-02	-3,71E-02
ADPe[3]	kg Sb eq	1,73E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,06E-06	7,00E-05	6,78E-06	1,07E-05	-4,31E-06
ADPf[3]	MJ	1,16E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,39E+01	1,34E+02	2,04E+00
WDP[3]	m^3 eq	4,26E+01	2,73E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,48E+01	1,37E+00	1,49E+00	6,18E+00	-1,81E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,08E+02	7,92E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,65E+00	1,08E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,08E+02	7,92E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,65E+00	1,08E+00	1,96E+00
PENRE	MJ	1,15E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,15E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
SM	kg	1,62E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,98E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	8,05E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,38E+00	6,33E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,16E-02	3,43E-02	1,46E-01	-4,22E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,08E-03	1,53E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,56E-04	7,66E-04	3,65E-05	1,98E-04	-4,51E-05
NHWD	kg	1,17E+01	2,82E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,54E-01	1,41E+01	1,71E-01	9,14E+02	-1,21E-02
RWD	kg	6,12E-03	4,03E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,01E-03	3,13E-04	8,83E-04	5,82E-06
CRU	kg	1,44E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,96E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C20/25-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1,90E+02	3,88E+00	8,57E+00	-1,18E+01	0	0	0	0	0	0	1,51E+01	1,94E+01	9,85E-01	-4,65E+00	-4,55E-01
GWP-fossil	kg CO_2 eq	1,90E+02	3,88E+00	8,57E+00	-1,18E+01	0	0	0	0	0	0	1,51E+01	1,94E+01	9,71E-01	-4,65E+00	-4,58E-01
GWP-biogenic	kg CO_2 eq	5,43E-02	1,31E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,48E-03	6,54E-03	1,05E-02	2,71E-03	1,78E-03
GWP-luluc	kg CO_2 eq	2,54E-02	1,32E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,58E-03	4,12E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	1,89E+02	3,85E+00	1,24E+00	-1,18E+01	0	0	0	0	0	0	4,95E-01	1,92E+01	9,37E-01	-4,75E+00	-4,19E-01
ODP	kg CFC-11 eq	1,20E-05	8,88E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,26E-06	4,44E-06	2,52E-07	1,99E-06	-2,00E-07
AP	mol H^+ eq	6,00E-01	1,94E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,57E-01	9,72E-02	1,87E-02	4,56E-02	-3,13E-02
EP-freshwater	kg PO_4^{-3} eq	7,92E-02	8,06E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,40E-03	4,03E-03	1,09E-02	1,38E-03	4,61E-03
EP-freshwater[2]	kg P eq	2,58E-02	2,63E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,56E-04	1,31E-03	3,56E-03	4,51E-04	1,50E-03
EP-marine	kg N eq	2,07E-01	6,78E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,98E-02	3,39E-02	4,20E-03	1,59E-02	-1,21E-02
EP-terrestrial	mol N eq	2,37E+00	7,41E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,65E-01	3,70E-01	3,84E-02	1,74E-01	-1,78E-01
POCP	kg NMVOCeq	5,78E-01	2,11E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,10E-01	1,05E-01	1,08E-02	5,05E-02	-3,73E-02
ADPe[3]	kg Sb eq	1,65E-04	1,41E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,10E-06	7,05E-05	6,82E-06	1,08E-05	-4,34E-06
ADPf[3]	MJ	1,07E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,96E+02	5,42E+01	1,35E+02	2,05E+00
WDP[3]	m^3 eq	4,14E+01	2,75E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,49E+01	1,37E+00	1,49E+00	6,22E+00	-1,82E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	9,42E+01	7,97E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,99E+00	6,69E+00	1,09E+00	1,97E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	9,42E+01	7,97E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,99E+00	6,69E+00	1,09E+00	1,97E+00
PENRE	MJ	1,07E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,96E+02	5,42E+01	1,35E+02	2,05E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,07E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,96E+02	5,42E+01	1,35E+02	2,05E+00
SM	kg	1,37E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,12E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,74E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,38E+00	6,37E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,18E-02	3,45E-02	1,47E-01	-4,25E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,11E-03	1,54E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,60E-04	7,70E-04	3,67E-05	2,00E-04	-4,54E-05
NHWD	kg	1,29E+01	2,84E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,55E-01	1,42E+01	1,72E-01	9,19E+02	-1,22E-02
RWD	kg	5,73E-03	4,05E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,03E-03	3,15E-04	8,89E-04	5,85E-06
CRU	kg	1,45E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	8,02E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C25/30-16mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,21E+02	3,86E+00	8,57E+00	-9,45E+00	0	0	0	0	0	0	1,50E+01	1,93E+01	1,40E+00	-4,70E+00	-4,52E-01
GWP-fossil	kg CO_2 eq	2,21E+02	3,86E+00	8,57E+00	-9,45E+00	0	0	0	0	0	0	1,50E+01	1,93E+01	1,39E+00	-4,70E+00	-4,55E-01
GWP-biogenic	kg CO_2 eq	5,95E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,47E-03	6,50E-03	1,04E-02	2,69E-03	1,77E-03
GWP-luluc	kg CO_2 eq	2,74E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,19E-03	6,54E-03	4,09E-03	1,30E-03	1,13E-03
GWP-GHG[1]	kg CO_2 eq	2,20E+02	3,82E+00	1,24E+00	-9,45E+00	0	0	0	0	0	0	4,92E-01	1,91E+01	1,36E+00	-4,80E+00	-4,17E-01
ODP	kg CFC-11 eq	1,29E-05	8,83E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,24E-06	4,41E-06	2,51E-07	1,98E-06	-1,99E-07
AP	mol H^+ eq	6,65E-01	1,93E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,56E-01	9,66E-02	1,86E-02	4,53E-02	-3,11E-02
EP-freshwater	kg PO_4^{-3} eq	9,18E-02	8,01E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,00E-03	1,09E-02	1,37E-03	4,58E-03
EP-freshwater[2]	kg P eq	2,99E-02	2,61E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,53E-04	1,31E-03	3,54E-03	4,48E-04	1,49E-03
EP-marine	kg N eq	2,30E-01	6,74E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,94E-02	3,37E-02	4,18E-03	1,58E-02	-1,20E-02
EP-terrestrial	mol N eq	2,61E+00	7,36E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,60E-01	3,68E-01	3,81E-02	1,73E-01	-1,77E-01
POCP	kg NMVOCeq	6,37E-01	2,10E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,02E-02	-3,71E-02
ADPe[3]	kg Sb eq	1,73E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,06E-06	7,00E-05	6,78E-06	1,07E-05	-4,31E-06
ADPf[3]	MJ	1,18E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,04E+00
WDP[3]	m^3 eq	4,27E+01	2,73E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,48E+01	1,37E+00	1,48E+00	6,18E+00	-1,81E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,11E+02	7,92E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,65E+00	1,08E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,11E+02	7,92E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,65E+00	1,08E+00	1,96E+00
PENRE	MJ	1,18E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,18E+03	5,88E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
SM	kg	1,66E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	7,33E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	8,20E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,37E+00	6,33E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,16E-02	3,42E-02	1,46E-01	-4,22E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,07E-03	1,53E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,56E-04	7,66E-04	3,65E-05	1,98E-04	-4,51E-05
NHWD	kg	1,13E+01	2,82E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,54E-01	1,41E+01	1,71E-01	9,14E+02	-1,21E-02
RWD	kg	6,19E-03	4,03E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,01E-03	3,13E-04	8,83E-04	5,82E-06
CRU	kg	1,66E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,82E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C25/30-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,05E+02	3,92E+00	8,57E+00	-8,57E+00	0	0	0	0	0	0	1,52E+01	1,96E+01	1,60E+00	-3,75E+00	-4,59E-01
GWP-fossil	kg CO_2 eq	2,05E+02	3,91E+00	8,57E+00	-8,57E+00	0	0	0	0	0	0	1,52E+01	1,96E+01	1,59E+00	-3,75E+00	-4,62E-01
GWP-biogenic	kg CO_2 eq	5,75E-02	1,32E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,50E-03	6,60E-03	1,06E-02	2,73E-03	1,80E-03
GWP-luluc	kg CO_2 eq	2,68E-02	1,33E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,21E-03	6,64E-03	4,15E-03	1,32E-03	1,15E-03
GWP-GHG[1]	kg CO_2 eq	2,04E+02	3,88E+00	1,24E+00	-8,57E+00	0	0	0	0	0	0	5,00E-01	1,94E+01	1,55E+00	-3,85E+00	-4,23E-01
ODP	kg CFC-11 eq	1,27E-05	8,96E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,29E-06	4,48E-06	2,54E-07	2,01E-06	-2,02E-07
AP	mol H^+ eq	6,38E-01	1,96E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,59E-01	9,81E-02	1,89E-02	4,60E-02	-3,16E-02
EP-freshwater	kg PO_4^{-3} eq	8,54E-02	8,13E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,41E-03	4,06E-03	1,10E-02	1,39E-03	4,65E-03
EP-freshwater[2]	kg P eq	2,79E-02	2,65E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,60E-04	1,33E-03	3,59E-03	4,55E-04	1,52E-03
EP-marine	kg N eq	2,21E-01	6,84E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	7,04E-02	3,42E-02	4,24E-03	1,60E-02	-1,22E-02
EP-terrestrial	mol N eq	2,51E+00	7,47E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,71E-01	3,74E-01	3,87E-02	1,76E-01	-1,79E-01
POCP	kg NMVOCeq	6,15E-01	2,13E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,12E-01	1,06E-01	1,09E-02	5,09E-02	-3,76E-02
ADPe[3]	kg Sb eq	1,74E-04	1,42E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,15E-06	7,11E-05	6,88E-06	1,09E-05	-4,38E-06
ADPf[3]	MJ	1,14E+03	5,97E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,09E+02	2,98E+02	5,47E+01	1,36E+02	2,07E+00
WDP[3]	m^3 eq	4,22E+01	2,77E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,51E+01	1,39E+00	1,51E+00	6,27E+00	-1,83E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,02E+02	8,04E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	4,02E+00	6,75E+00	1,10E+00	1,99E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,02E+02	8,04E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	4,02E+00	6,75E+00	1,10E+00	1,99E+00
PENRE	MJ	1,14E+03	5,97E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,09E+02	2,98E+02	5,46E+01	1,36E+02	2,06E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,14E+03	5,97E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,09E+02	2,98E+02	5,46E+01	1,36E+02	2,06E+00
SM	kg	1,51E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,65E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	7,45E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,38E+00	6,42E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,16E-02	3,21E-02	3,48E-02	1,48E-01	-4,28E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,14E-03	1,55E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,65E-04	7,77E-04	3,70E-05	2,01E-04	-4,58E-05
NHWD	kg	1,31E+01	2,86E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,57E-01	1,43E+01	1,74E-01	9,27E+02	-1,23E-02
RWD	kg	6,09E-03	4,09E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,46E-03	2,04E-03	3,18E-04	8,97E-04	5,91E-06
CRU	kg	1,50E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,93E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C25/30-31.5mm – SEASIDE

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,17E+02	3,90E+00	8,57E+00	-8,89E+00	0	0	0	0	0	0	1,52E+01	1,95E+01	1,53E+00	-4,09E+00	-4,57E-01
GWP-fossil	kg CO_2 eq	2,17E+02	3,89E+00	8,57E+00	-8,89E+00	0	0	0	0	0	0	1,52E+01	1,95E+01	1,52E+00	-4,10E+00	-4,59E-01
GWP-biogenic	kg CO_2 eq	6,20E-02	1,31E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,49E-03	6,57E-03	1,05E-02	2,72E-03	1,79E-03
GWP-luluc	kg CO_2 eq	2,98E-02	1,32E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,61E-03	4,13E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	2,16E+02	3,86E+00	1,24E+00	-8,89E+00	0	0	0	0	0	0	4,97E-01	1,93E+01	1,48E+00	-4,20E+00	-4,21E-01
ODP	kg CFC-11 eq	1,43E-05	8,92E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,27E-06	4,46E-06	2,53E-07	2,00E-06	-2,01E-07
AP	mol H^+ eq	6,84E-01	1,95E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,58E-01	9,76E-02	1,88E-02	4,57E-02	-3,15E-02
EP-freshwater	kg PO_4^{-3} eq	9,00E-02	8,09E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,40E-03	4,04E-03	1,10E-02	1,39E-03	4,63E-03
EP-freshwater[2]	kg P eq	2,93E-02	2,64E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,58E-04	1,32E-03	3,58E-03	4,52E-04	1,51E-03
EP-marine	kg N eq	2,37E-01	6,81E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	7,01E-02	3,40E-02	4,22E-03	1,60E-02	-1,22E-02
EP-terrestrial	mol N eq	2,69E+00	7,44E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,68E-01	3,72E-01	3,85E-02	1,75E-01	-1,78E-01
POCP	kg NMVOCeq	6,62E-01	2,12E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,11E-01	1,06E-01	1,09E-02	5,07E-02	-3,74E-02
ADPe[3]	kg Sb eq	2,00E-04	1,41E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,12E-06	7,07E-05	6,85E-06	1,08E-05	-4,36E-06
ADPf[3]	MJ	1,26E+03	5,94E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,97E+02	5,44E+01	1,36E+02	2,06E+00
WDP[3]	m^3 eq	4,30E+01	2,76E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,50E+01	1,38E+00	1,50E+00	6,24E+00	-1,82E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,09E+02	8,00E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	4,00E+00	6,72E+00	1,09E+00	1,98E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,09E+02	8,00E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	4,00E+00	6,72E+00	1,09E+00	1,98E+00
PENRE	MJ	1,25E+03	5,94E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,97E+02	5,44E+01	1,36E+02	2,05E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,25E+03	5,94E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,97E+02	5,44E+01	1,36E+02	2,05E+00
SM	kg	1,60E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,72E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	8,04E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,38E+00	6,39E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,16E-02	3,20E-02	3,46E-02	1,48E-01	-4,26E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,36E-03	1,55E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,62E-04	7,73E-04	3,68E-05	2,00E-04	-4,56E-05
NHWD	kg	1,68E+01	2,85E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,56E-01	1,42E+01	1,73E-01	9,23E+02	-1,22E-02
RWD	kg	6,84E-03	4,07E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,45E-03	2,03E-03	3,16E-04	8,92E-04	5,88E-06
CRU	kg	1,22E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,82E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C25/30-31.5mm – WATERPROOF

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,15E+02	3,89E+00	8,57E+00	-8,97E+00	0	0	0	0	0	0	1,51E+01	1,94E+01	1,51E+00	-4,18E+00	-4,55E-01
GWP-fossil	kg CO_2 eq	2,14E+02	3,89E+00	8,57E+00	-8,97E+00	0	0	0	0	0	0	1,51E+01	1,94E+01	1,50E+00	-4,18E+00	-4,58E-01
GWP-biogenic	kg CO_2 eq	5,97E-02	1,31E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,49E-03	6,55E-03	1,05E-02	2,71E-03	1,79E-03
GWP-luluc	kg CO_2 eq	2,80E-02	1,32E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,59E-03	4,13E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	2,13E+02	3,85E+00	1,24E+00	-8,97E+00	0	0	0	0	0	0	4,96E-01	1,93E+01	1,46E+00	-4,28E+00	-4,20E-01
ODP	kg CFC-11 eq	1,33E-05	8,90E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,26E-06	4,45E-06	2,53E-07	1,99E-06	-2,00E-07
AP	mol H^+ eq	6,62E-01	1,95E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,58E-01	9,74E-02	1,88E-02	4,56E-02	-3,14E-02
EP-freshwater	kg PO_4^{-3} eq	8,90E-02	8,07E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,40E-03	4,04E-03	1,09E-02	1,38E-03	4,62E-03
EP-freshwater[2]	kg P eq	2,90E-02	2,63E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,57E-04	1,32E-03	3,57E-03	4,51E-04	1,51E-03
EP-marine	kg N eq	2,29E-01	6,79E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,99E-02	3,40E-02	4,21E-03	1,59E-02	-1,21E-02
EP-terrestrial	mol N eq	2,61E+00	7,42E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,66E-01	3,71E-01	3,84E-02	1,74E-01	-1,78E-01
POCP	kg NMVOCeq	6,38E-01	2,11E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,10E-01	1,06E-01	1,09E-02	5,06E-02	-3,73E-02
ADPe[3]	kg Sb eq	1,82E-04	1,41E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,11E-06	7,06E-05	6,83E-06	1,08E-05	-4,35E-06
ADPf[3]	MJ	1,19E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,06E+00
WDP[3]	m^3 eq	4,25E+01	2,75E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,50E+01	1,38E+00	1,50E+00	6,23E+00	-1,82E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,07E+02	7,99E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,97E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,07E+02	7,99E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,97E+00
PENRE	MJ	1,19E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,05E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,19E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,05E+00
SM	kg	1,59E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	6,88E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	7,92E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,38E+00	6,38E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,16E-02	3,19E-02	3,45E-02	1,47E-01	-4,25E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,19E-03	1,54E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,61E-04	7,72E-04	3,68E-05	2,00E-04	-4,55E-05
NHWD	kg	1,37E+01	2,84E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,56E-01	1,42E+01	1,73E-01	9,21E+02	-1,22E-02
RWD	kg	6,37E-03	4,06E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,45E-03	2,03E-03	3,16E-04	8,90E-04	5,86E-06
CRU	kg	1,43E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,70E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C30/37-16mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,57E+02	3,86E+00	8,57E+00	-1,11E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	1,12E+00	-6,38E+00	-4,53E-01
GWP-fossil	kg CO_2 eq	2,57E+02	3,86E+00	8,57E+00	-1,11E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	1,10E+00	-6,38E+00	-4,55E-01
GWP-biogenic	kg CO_2 eq	6,13E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,47E-03	6,51E-03	1,04E-02	2,70E-03	1,77E-03
GWP-luluc	kg CO_2 eq	2,83E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,19E-03	6,55E-03	4,10E-03	1,30E-03	1,13E-03
GWP-GHG[1]	kg CO_2 eq	2,55E+02	3,83E+00	1,24E+00	-1,11E+01	0	0	0	0	0	0	4,93E-01	1,91E+01	1,07E+00	-6,48E+00	-4,17E-01
ODP	kg CFC-11 eq	1,33E-05	8,84E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,24E-06	4,42E-06	2,51E-07	1,98E-06	-1,99E-07
AP	mol H^+ eq	7,14E-01	1,94E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,57E-01	9,68E-02	1,86E-02	4,53E-02	-3,12E-02
EP-freshwater	kg PO_4^{-3} eq	1,08E-01	8,02E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,01E-03	1,09E-02	1,38E-03	4,59E-03
EP-freshwater[2]	kg P eq	3,53E-02	2,62E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,54E-04	1,31E-03	3,54E-03	4,48E-04	1,50E-03
EP-marine	kg N eq	2,40E-01	6,75E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,95E-02	3,38E-02	4,18E-03	1,58E-02	-1,21E-02
EP-terrestrial	mol N eq	2,71E+00	7,37E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,61E-01	3,69E-01	3,82E-02	1,73E-01	-1,77E-01
POCP	kg NMVOCeq	6,62E-01	2,10E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,03E-02	-3,71E-02
ADPe[3]	kg Sb eq	1,58E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,07E-06	7,01E-05	6,79E-06	1,07E-05	-4,32E-06
ADPf[3]	MJ	1,29E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,39E+01	1,35E+02	2,05E+00
WDP[3]	m^3 eq	4,25E+01	2,73E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,49E+01	1,37E+00	1,49E+00	6,19E+00	-1,81E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,17E+02	7,93E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,66E+00	1,08E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,17E+02	7,93E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,66E+00	1,08E+00	1,96E+00
PENRE	MJ	1,32E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,39E+01	1,35E+02	2,04E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,32E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,39E+01	1,35E+02	2,04E+00
SM	kg	1,57E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,02E+02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,83E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,36E+00	6,34E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,17E-02	3,43E-02	1,46E-01	-4,23E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,08E-03	1,53E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,57E-04	7,67E-04	3,65E-05	1,99E-04	-4,52E-05
NHWD	kg	1,15E+01	2,82E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,54E-01	1,41E+01	1,72E-01	9,15E+02	-1,21E-02
RWD	kg	6,37E-03	4,03E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,02E-03	3,14E-04	8,85E-04	5,83E-06
CRU	kg	5,06E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,86E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C30/37-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,39E+02	3,87E+00	8,57E+00	-1,02E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	1,29E+00	-5,42E+00	-4,53E-01
GWP-fossil	kg CO_2 eq	2,39E+02	3,87E+00	8,57E+00	-1,02E+01	0	0	0	0	0	0	1,50E+01	1,93E+01	1,27E+00	-5,43E+00	-4,56E-01
GWP-biogenic	kg CO_2 eq	5,88E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,47E-03	6,52E-03	1,04E-02	2,70E-03	1,78E-03
GWP-luluc	kg CO_2 eq	2,75E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,56E-03	4,10E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	2,37E+02	3,83E+00	1,24E+00	-1,02E+01	0	0	0	0	0	0	4,94E-01	1,92E+01	1,24E+00	-5,53E+00	-4,18E-01
ODP	kg CFC-11 eq	1,29E-05	8,85E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,25E-06	4,42E-06	2,51E-07	1,98E-06	-1,99E-07
AP	mol H^+ eq	6,80E-01	1,94E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,57E-01	9,69E-02	1,87E-02	4,54E-02	-3,12E-02
EP-freshwater	kg PO_4^{-3} eq	1,01E-01	8,03E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,01E-03	1,09E-02	1,38E-03	4,59E-03
EP-freshwater[2]	kg P eq	3,29E-02	2,62E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,54E-04	1,31E-03	3,55E-03	4,49E-04	1,50E-03
EP-marine	kg N eq	2,28E-01	6,76E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,96E-02	3,38E-02	4,19E-03	1,58E-02	-1,21E-02
EP-terrestrial	mol N eq	2,59E+00	7,38E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,62E-01	3,69E-01	3,83E-02	1,73E-01	-1,77E-01
POCP	kg NMVOCeq	6,33E-01	2,10E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,03E-02	-3,72E-02
ADPe[3]	kg Sb eq	1,57E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,08E-06	7,02E-05	6,80E-06	1,08E-05	-4,33E-06
ADPf[3]	MJ	1,24E+03	5,89E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,95E+02	5,40E+01	1,35E+02	2,05E+00
WDP[3]	m^3 eq	4,18E+01	2,74E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,49E+01	1,37E+00	1,49E+00	6,20E+00	-1,81E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,08E+02	7,94E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,67E+00	1,09E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,08E+02	7,94E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,97E+00	6,67E+00	1,09E+00	1,96E+00
PENRE	MJ	1,26E+03	5,90E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,95E+02	5,40E+01	1,35E+02	2,04E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,26E+03	5,90E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,07E+02	2,95E+02	5,40E+01	1,35E+02	2,04E+00
SM	kg	1,43E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	9,39E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,16E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,36E+00	6,34E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,17E-02	3,43E-02	1,47E-01	-4,23E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,12E-03	1,54E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,58E-04	7,68E-04	3,66E-05	1,99E-04	-4,53E-05
NHWD	kg	1,28E+01	2,83E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,54E-01	1,41E+01	1,72E-01	9,16E+02	-1,21E-02
RWD	kg	6,20E-03	4,04E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,44E-03	2,02E-03	3,14E-04	8,86E-04	5,83E-06
CRU	kg	4,73E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,78E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C30/37-31.5mm – SEASIDE

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,49E+02	3,89E+00	8,57E+00	-1,07E+01	0	0	0	0	0	0	1,51E+01	1,95E+01	1,20E+00	-5,97E+00	-4,56E-01
GWP-fossil	kg CO_2 eq	2,49E+02	3,89E+00	8,57E+00	-1,07E+01	0	0	0	0	0	0	1,51E+01	1,94E+01	1,19E+00	-5,97E+00	-4,59E-01
GWP-biogenic	kg CO_2 eq	6,07E-02	1,31E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,49E-03	6,56E-03	1,05E-02	2,71E-03	1,79E-03
GWP-luluc	kg CO_2 eq	2,80E-02	1,32E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,60E-03	4,13E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	2,47E+02	3,85E+00	1,24E+00	-1,07E+01	0	0	0	0	0	0	4,97E-01	1,93E+01	1,16E+00	-6,07E+00	-4,20E-01
ODP	kg CFC-11 eq	1,31E-05	8,90E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,26E-06	4,45E-06	2,53E-07	1,99E-06	-2,01E-07
AP	mol H^+ eq	7,02E-01	1,95E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,58E-01	9,74E-02	1,88E-02	4,57E-02	-3,14E-02
EP-freshwater	kg PO_4^{-3} eq	1,05E-01	8,07E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,40E-03	4,04E-03	1,09E-02	1,38E-03	4,62E-03
EP-freshwater[2]	kg P eq	3,42E-02	2,63E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,57E-04	1,32E-03	3,57E-03	4,52E-04	1,51E-03
EP-marine	kg N eq	2,37E-01	6,80E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	7,00E-02	3,40E-02	4,21E-03	1,59E-02	-1,22E-02
EP-terrestrial	mol N eq	2,68E+00	7,43E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,66E-01	3,71E-01	3,85E-02	1,74E-01	-1,78E-01
POCP	kg NMVOCeq	6,55E-01	2,11E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,10E-01	1,06E-01	1,09E-02	5,06E-02	-3,74E-02
ADPe[3]	kg Sb eq	1,59E-04	1,41E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,11E-06	7,06E-05	6,83E-06	1,08E-05	-4,35E-06
ADPf[3]	MJ	1,27E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,06E+00
WDP[3]	m^3 eq	4,25E+01	2,75E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,50E+01	1,38E+00	1,50E+00	6,23E+00	-1,82E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,14E+02	7,99E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,98E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,14E+02	7,99E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,98E+00
PENRE	MJ	1,29E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,05E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,29E+03	5,93E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,05E+00
SM	kg	1,57E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	9,66E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,96E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,36E+00	6,38E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,16E-02	3,19E-02	3,45E-02	1,47E-01	-4,26E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,07E-03	1,54E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,61E-04	7,72E-04	3,68E-05	2,00E-04	-4,55E-05
NHWD	kg	1,15E+01	2,84E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,56E-01	1,42E+01	1,73E-01	9,21E+02	-1,22E-02
RWD	kg	6,31E-03	4,06E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,45E-03	2,03E-03	3,16E-04	8,91E-04	5,87E-06
CRU	kg	4,49E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,85E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C30/37-31.5mm WATERPROOF

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,42E+02	3,89E+00	8,57E+00	-1,03E+01	0	0	0	0	0	0	1,51E+01	1,94E+01	1,28E+00	-5,50E+00	-4,55E-01
GWP-fossil	kg CO_2 eq	2,41E+02	3,88E+00	8,57E+00	-1,03E+01	0	0	0	0	0	0	1,51E+01	1,94E+01	1,27E+00	-5,50E+00	-4,58E-01
GWP-biogenic	kg CO_2 eq	5,94E-02	1,31E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,48E-03	6,55E-03	1,05E-02	2,71E-03	1,79E-03
GWP-luluc	kg CO_2 eq	2,79E-02	1,32E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,20E-03	6,59E-03	4,12E-03	1,31E-03	1,14E-03
GWP-GHG[1]	kg CO_2 eq	2,40E+02	3,85E+00	1,24E+00	-1,03E+01	0	0	0	0	0	0	4,96E-01	1,93E+01	1,23E+00	-5,60E+00	-4,20E-01
ODP	kg CFC-11 eq	1,31E-05	8,89E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,26E-06	4,45E-06	2,52E-07	1,99E-06	-2,00E-07
AP	mol H^+ eq	6,87E-01	1,95E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,58E-01	9,73E-02	1,88E-02	4,56E-02	-3,14E-02
EP-freshwater	kg PO_4^{-3} eq	1,02E-01	8,07E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,40E-03	4,03E-03	1,09E-02	1,38E-03	4,62E-03
EP-freshwater[2]	kg P eq	3,33E-02	2,63E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,57E-04	1,32E-03	3,57E-03	4,51E-04	1,51E-03
EP-marine	kg N eq	2,31E-01	6,79E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,99E-02	3,40E-02	4,21E-03	1,59E-02	-1,21E-02
EP-terrestrial	mol N eq	2,61E+00	7,42E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,66E-01	3,71E-01	3,84E-02	1,74E-01	-1,78E-01
POCP	kg NMVOCeq	6,40E-01	2,11E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,10E-01	1,06E-01	1,09E-02	5,06E-02	-3,73E-02
ADPe[3]	kg Sb eq	1,59E-04	1,41E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,11E-06	7,06E-05	6,83E-06	1,08E-05	-4,35E-06
ADPf[3]	MJ	1,25E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,43E+01	1,35E+02	2,06E+00
WDP[3]	m^3 eq	4,19E+01	2,75E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,49E+01	1,38E+00	1,50E+00	6,23E+00	-1,82E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,09E+02	7,98E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,97E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,09E+02	7,98E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,08E+00	3,99E+00	6,70E+00	1,09E+00	1,97E+00
PENRE	MJ	1,28E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,42E+01	1,35E+02	2,05E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,28E+03	5,92E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,08E+02	2,96E+02	5,42E+01	1,35E+02	2,05E+00
SM	kg	1,44E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	9,51E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	6,18E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,36E+00	6,37E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,16E-02	3,19E-02	3,45E-02	1,47E-01	-4,25E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,15E-03	1,54E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,60E-04	7,71E-04	3,67E-05	2,00E-04	-4,55E-05
NHWD	kg	1,32E+01	2,84E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,55E-01	1,42E+01	1,73E-01	9,20E+02	-1,22E-02
RWD	kg	6,29E-03	4,06E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,45E-03	2,03E-03	3,15E-04	8,90E-04	5,86E-06
CRU	kg	4,81E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,72E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C35/45-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,99E+02	3,96E+00	8,57E+00	-7,79E+00	0	0	0	0	0	0	1,54E+01	1,98E+01	1,43E+00	-4,34E+00	-4,63E-01
GWP-fossil	kg CO_2 eq	2,99E+02	3,95E+00	8,57E+00	-7,79E+00	0	0	0	0	0	0	1,54E+01	1,98E+01	1,41E+00	-4,35E+00	-4,66E-01
GWP-biogenic	kg CO_2 eq	6,80E-02	1,33E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,53E-03	6,67E-03	1,07E-02	2,76E-03	1,82E-03
GWP-luluc	kg CO_2 eq	3,17E-02	1,34E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,22E-03	6,71E-03	4,20E-03	1,33E-03	1,16E-03
GWP-GHG[1]	kg CO_2 eq	2,97E+02	3,92E+00	1,24E+00	-7,79E+00	0	0	0	0	0	0	5,05E-01	1,96E+01	1,38E+00	-4,45E+00	-4,27E-01
ODP	kg CFC-11 eq	1,57E-05	9,05E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,32E-06	4,53E-06	2,57E-07	2,03E-06	-2,04E-07
AP	mol H^+ eq	8,28E-01	1,98E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,60E-01	9,91E-02	1,91E-02	4,64E-02	-3,19E-02
EP-freshwater	kg PO_4^{-3} eq	1,21E-01	8,21E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,42E-03	4,11E-03	1,11E-02	1,41E-03	4,70E-03
EP-freshwater[2]	kg P eq	3,96E-02	2,68E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,65E-04	1,34E-03	3,63E-03	4,59E-04	1,53E-03
EP-marine	kg N eq	2,86E-01	6,91E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	7,12E-02	3,46E-02	4,28E-03	1,62E-02	-1,24E-02
EP-terrestrial	mol N eq	3,21E+00	7,55E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,79E-01	3,78E-01	3,91E-02	1,77E-01	-1,81E-01
POCP	kg NMVOCeq	7,84E-01	2,15E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,14E-01	1,08E-01	1,11E-02	5,15E-02	-3,80E-02
ADPe[3]	kg Sb eq	1,82E-04	1,44E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,22E-06	7,18E-05	6,95E-06	1,10E-05	-4,42E-06
ADPf[3]	MJ	1,49E+03	6,03E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,11E+02	3,01E+02	5,52E+01	1,38E+02	2,09E+00
WDP[3]	m^3 eq	4,53E+01	2,80E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,52E+01	1,40E+00	1,52E+00	6,34E+00	-1,85E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,33E+02	8,12E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,10E+00	4,06E+00	6,82E+00	1,11E+00	2,01E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,33E+02	8,12E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,10E+00	4,06E+00	6,82E+00	1,11E+00	2,01E+00
PENRE	MJ	1,49E+03	6,03E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,11E+02	3,01E+02	5,52E+01	1,38E+02	2,09E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,49E+03	6,03E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,11E+02	3,01E+02	5,52E+01	1,38E+02	2,09E+00
SM	kg	2,00E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,08E+02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	1,05E+02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,39E+00	6,49E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,18E-02	3,24E-02	3,51E-02	1,50E-01	-4,33E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,12E-03	1,57E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,70E-04	7,85E-04	3,74E-05	2,03E-04	-4,63E-05
NHWD	kg	1,09E+01	2,89E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,60E-01	1,44E+01	1,76E-01	9,37E+02	-1,24E-02
RWD	kg	7,49E-03	4,13E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,47E-03	2,06E-03	3,21E-04	9,06E-04	5,97E-06
CRU	kg	3,38E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,91E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

C40/50-31.5mm

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	3,39E+02	3,81E+00	8,57E+00	-8,77E+00	0	0	0	0	0	0	1,48E+01	1,91E+01	1,10E+00	-5,68E+00	-4,47E-01
GWP-fossil	kg CO_2 eq	3,39E+02	3,81E+00	8,57E+00	-8,77E+00	0	0	0	0	0	0	1,48E+01	1,90E+01	1,09E+00	-5,69E+00	-4,49E-01
GWP-biogenic	kg CO_2 eq	6,76E-02	1,28E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,44E-03	6,42E-03	1,03E-02	2,66E-03	1,75E-03
GWP-luluc	kg CO_2 eq	3,21E-02	1,29E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,18E-03	6,46E-03	4,04E-03	1,29E-03	1,12E-03
GWP-GHG[1]	kg CO_2 eq	3,37E+02	3,78E+00	1,24E+00	-8,77E+00	0	0	0	0	0	0	4,87E-01	1,89E+01	1,05E+00	-5,78E+00	-4,12E-01
ODP	kg CFC-11 eq	1,49E-05	8,72E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,20E-06	4,36E-06	2,48E-07	1,95E-06	-1,97E-07
AP	mol H^+ eq	8,41E-01	1,91E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,55E-01	9,55E-02	1,84E-02	4,47E-02	-3,08E-02
EP-freshwater	kg PO_4^{-3} eq	1,46E-01	7,91E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,37E-03	3,96E-03	1,07E-02	1,36E-03	4,53E-03
EP-freshwater[2]	kg P eq	4,75E-02	2,58E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,48E-04	1,29E-03	3,50E-03	4,43E-04	1,48E-03
EP-marine	kg N eq	2,69E-01	6,66E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,86E-02	3,33E-02	4,13E-03	1,56E-02	-1,19E-02
EP-terrestrial	mol N eq	3,01E+00	7,28E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,51E-01	3,64E-01	3,77E-02	1,71E-01	-1,75E-01
POCP	kg NMVOCeq	7,41E-01	2,07E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,06E-01	1,04E-01	1,07E-02	4,96E-02	-3,66E-02
ADPe[3]	kg Sb eq	1,40E-04	1,38E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	5,99E-06	6,92E-05	6,70E-06	1,06E-05	-4,26E-06
ADPf[3]	MJ	1,59E+03	5,81E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,04E+02	2,90E+02	5,32E+01	1,33E+02	2,02E+00
WDP[3]	m^3 eq	4,25E+01	2,70E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,47E+01	1,35E+00	1,47E+00	6,11E+00	-1,78E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,33E+02	7,83E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,06E+00	3,91E+00	6,57E+00	1,07E+00	1,94E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,33E+02	7,83E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,06E+00	3,91E+00	6,57E+00	1,07E+00	1,94E+00
PENRE	MJ	1,68E+03	5,81E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,04E+02	2,90E+02	5,32E+01	1,33E+02	2,01E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,68E+03	5,81E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,04E+02	2,90E+02	5,32E+01	1,33E+02	2,01E+00
SM	kg	1,47E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,63E+02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	4,38E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,33E+00	6,25E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,13E-02	3,13E-02	3,38E-02	1,44E-01	-4,17E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,22E-03	1,51E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,50E-04	7,57E-04	3,60E-05	1,96E-04	-4,46E-05
NHWD	kg	1,39E+01	2,78E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,51E-01	1,39E+01	1,69E-01	9,03E+02	-1,19E-02
RWD	kg	7,22E-03	3,98E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,42E-03	1,99E-03	3,09E-04	8,73E-04	5,75E-06
CRU	kg	1,19E-02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,88E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ENVIRONMENTAL PERFORMANCE INDICATORS

PILES C20/25, 25/30, 30/37

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2,76E+02	3,85E+00	8,57E+00	-7,12E+00	0	0	0	0	0	0	1,50E+01	1,93E+01	1,49E+00	-3,67E+00	-4,51E-01
GWP-fossil	kg CO_2 eq	2,75E+02	3,85E+00	8,57E+00	-7,12E+00	0	0	0	0	0	0	1,50E+01	1,93E+01	1,48E+00	-3,68E+00	-4,54E-01
GWP-biogenic	kg CO_2 eq	6,59E-02	1,30E-03	1,46E-03	0,00E+00	0	0	0	0	0	0	2,46E-03	6,49E-03	1,04E-02	2,69E-03	1,77E-03
GWP-luluc	kg CO_2 eq	3,03E-02	1,31E-03	5,98E-04	0,00E+00	0	0	0	0	0	0	1,19E-03	6,54E-03	4,09E-03	1,30E-03	1,13E-03
GWP-GHG[1]	kg CO_2 eq	2,74E+02	3,82E+00	1,24E+00	-7,12E+00	0	0	0	0	0	0	4,92E-01	1,91E+01	1,44E+00	-3,78E+00	-4,16E-01
ODP	kg CFC-11 eq	1,43E-05	8,82E-07	1,87E-06	0,00E+00	0	0	0	0	0	0	3,23E-06	4,41E-06	2,50E-07	1,97E-06	-1,99E-07
AP	mol H^+ eq	7,64E-01	1,93E-02	1,43E-02	0,00E+00	0	0	0	0	0	0	1,56E-01	9,65E-02	1,86E-02	4,52E-02	-3,11E-02
EP-freshwater	kg PO_4^{-3} eq	1,15E-01	8,00E-04	7,27E-04	0,00E+00	0	0	0	0	0	0	1,39E-03	4,00E-03	1,08E-02	1,37E-03	4,58E-03
EP-freshwater[2]	kg P eq	3,76E-02	2,61E-04	2,37E-04	0,00E+00	0	0	0	0	0	0	4,53E-04	1,30E-03	3,54E-03	4,47E-04	1,49E-03
EP-marine	kg N eq	2,59E-01	6,73E-03	1,81E-03	0,00E+00	0	0	0	0	0	0	6,93E-02	3,37E-02	4,17E-03	1,58E-02	-1,20E-02
EP-terrestrial	mol N eq	2,92E+00	7,36E-02	1,94E-02	0,00E+00	0	0	0	0	0	0	7,59E-01	3,68E-01	3,81E-02	1,73E-01	-1,76E-01
POCP	kg NMVOCeq	7,14E-01	2,09E-02	8,00E-03	0,00E+00	0	0	0	0	0	0	2,09E-01	1,05E-01	1,08E-02	5,01E-02	-3,70E-02
ADPe[3]	kg Sb eq	1,73E-04	1,40E-05	2,14E-06	0,00E+00	0	0	0	0	0	0	6,06E-06	7,00E-05	6,77E-06	1,07E-05	-4,31E-06
ADPf[3]	MJ	1,38E+03	5,87E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,04E+00
WDP[3]	m^3 eq	4,39E+01	2,73E-01	2,98E+01	0,00E+00	0	0	0	0	0	0	1,48E+01	1,36E+00	1,48E+00	6,17E+00	-1,80E+00

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil, **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

[1] This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013). [2] Eutrophication aquatic freshwater shall be given in both kg PO_4^{-3} eq and kg P eq. [3] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCE USE

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,29E+02	7,91E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,64E+00	1,08E+00	1,96E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,29E+02	7,91E-01	7,21E-01	0,00E+00	0	0	0	0	0	0	1,07E+00	3,96E+00	6,64E+00	1,08E+00	1,96E+00
PENRE	MJ	1,39E+03	5,87E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,39E+03	5,87E+01	1,18E+02	0,00E+00	0	0	0	0	0	0	2,06E+02	2,94E+02	5,38E+01	1,34E+02	2,03E+00
SM	kg	1,84E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,05E+02	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	8,41E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,37E+00	6,32E-03	6,97E-01	0,00E+00	0	0	0	0	0	0	1,15E-02	3,16E-02	3,42E-02	1,46E-01	-4,22E-02

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 resources, **SM:** Use of secondary materials, **RSF:** Use of renewable secondary materials, **NRSF:** Use of non-renewable secondary fuels, **FW:** Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1,09E-03	1,53E-04	3,10E-04	0,00E+00	0	0	0	0	0	0	5,56E-04	7,65E-04	3,64E-05	1,98E-04	-4,51E-05
NHWD	kg	1,11E+01	2,82E+00	7,89E-02	0,00E+00	0	0	0	0	0	0	2,53E-01	1,41E+01	1,71E-01	9,13E+02	-1,21E-02
RWD	kg	6,85E-03	4,02E-04	8,43E-04	0,00E+00	0	0	0	0	0	0	1,43E-03	2,01E-03	3,13E-04	8,82E-04	5,81E-06
CRU	kg	4,37E-03	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	7,91E+01	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD: Hazardous waste disposed, **NHWD:** Non-hazardous waste disposed, **RWD:** Radioactive waste disposed, **CRU:** Components for re-use, **MFR:** Materials for recycling, **MER:** Materials for energy recovery, **EE:** Exported energy

ADDITIONAL INFORMATION

The EPD does not give information on release of dangerous substances to soil, water and indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods according to the provisions of the respective technical committees for European product standards are not available.

REVISION DETAILS

Change of raw material name (CEM II/B-M (P-W-L) 42.5N).

REFERENCES

- **GPI v.3.01:2019-09-18** General Programme Instructions of the International EPD® System
- **PCR 2019:14 v.1.11** Product Category rules | Construction products | The International EPD® System
- **EN 15804:2012+A2:2019** Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
- **c-PCR-003** Concrete and concrete elements (EN 16757:2017) | The International EPD® System
- **EN 16757:2017** Sustainability of construction works – Environmental product declarations - Product Category Rules for concrete and concrete elements
- **EN 197-1:2011** Part 1 Composition, specifications and conformity criteria for common cements
- **EN 206:2013+A1:2016** Concrete. Specification, performance, production and conformity
- **KTS 2016** Hellenic Concrete Technology Regulation KTS 2016
- **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
- **Ecoinvent** Ecoinvent Centre | www.Eco-invent.org
- **DAPEEP SA:** Renewable Energy Sources Operator & Guarantees of Origin | Greece www.dapeep.gr
- **Hellenic Statistical Authority (ELSTAT)** | https://www.statistics.gr/en/home/
- **NEED4B** New Energy Efficient Demonstration for Buildings, LCA and LCC during the design, construction and operation phases, Working package 2, Deliverable D2.5, January 2016
- **PN514** BRE Global Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013.
- Gervasio, H. and Dimova, S., 2018. Model for life cycle assessment (LCA) of buildings. Publications Office of the European Union: Brussels, Belgium.
- Andersson, R., Fridh, K., Stripple, H. and Häglund, M., 2013. Calculating CO_2 uptake for existing concrete structures during and after service life. Environmental science & technology, 47(20), pp.11625-11633.

CONTACT INFORMATION

EPD owner	LAFARGE	32 D.Solomou Str., 14123 Lykovrissi, Greece email: info.heracles@lafargeholcim.com www.lafarge.gr
LCA author	ENVIROMETRICS Business Consultants & Engineers	20 Karea str., 11636, Athens, Greece email: info@envirometrics.gr www.envirometrics.gr
Programme operator	EPD® THE INTERNATIONAL EPD® SYSTEM	Valhallavägen 81, 114 27 Stockholm, Sweden email: info@environdec.com www.environdec.com
Verifier	EURO CERT	Chlois 89, Athina 144 52, Greece email: info@eurocert.gr www.eurocert.gr

PROGRAMME-RELATED INFORMATION

Product group classification: UN CPC 3744

The CEN standard EN 15804 serves as the core Product Category Rules

PCR 2019:14 Construction products (EN 15804:A2); Version 1.11; 2021-02-05
c-PCR-003 Concrete and concrete elements (EN 16757) (2019-12-20)

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

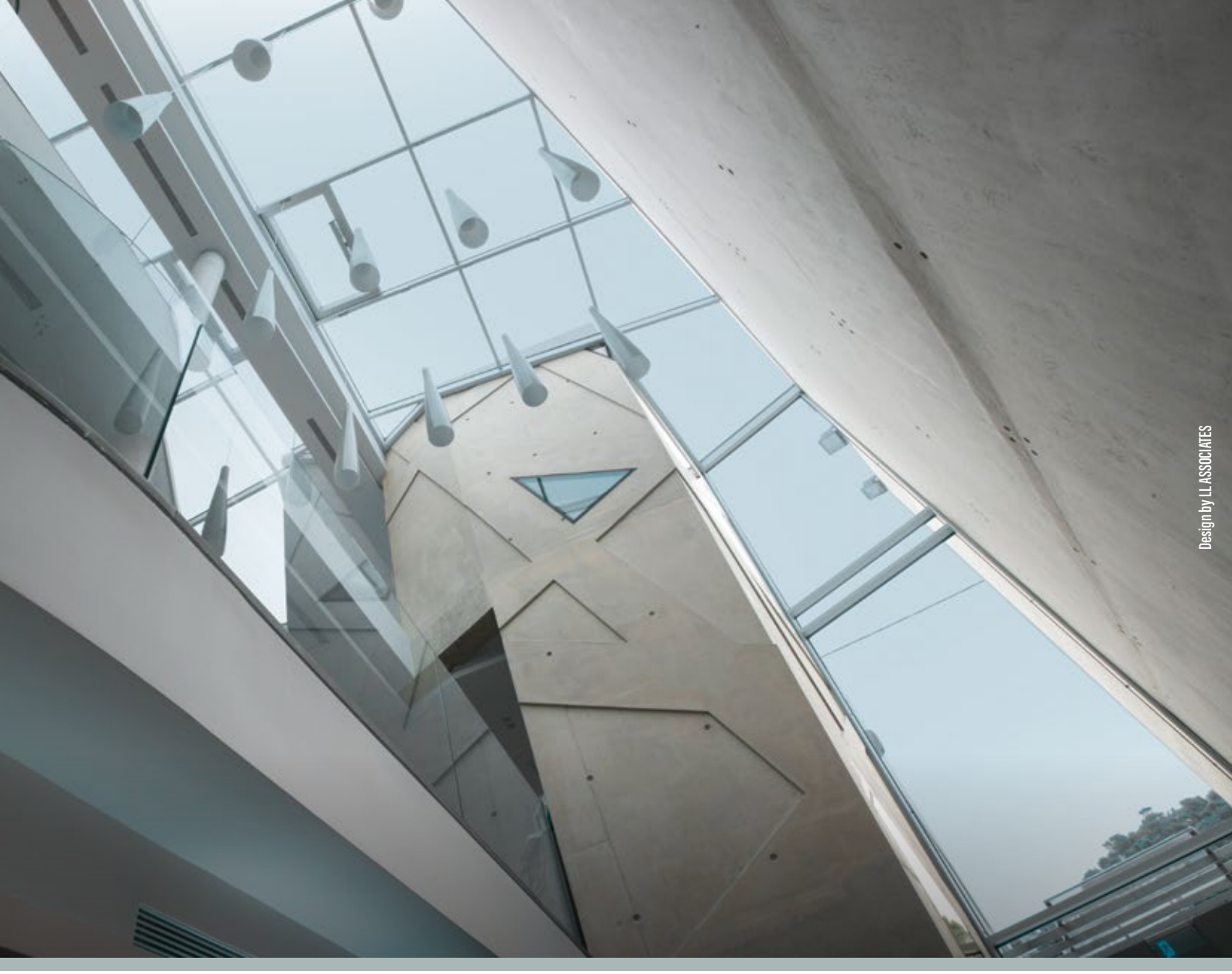
Independent third-party verification of the declaration and data in accordance with ISO 14025:2006
☐ EPD process certification ☒ EPD verification

Procedure for follow-up during EPD validity involves third party verifier
☒ Yes ☐ No

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

DIFFERENCES VERSUS THE PREVIOUS VERSION

Since the first publication of the EPD (2021-12-06), a new version (2022-10-11) was created regarding an editorial correction for the c-PCR in the PROGRAMME-RELATED INFORMATION.



Design by LL ASSOCIATES

LAFARGE