ENVIRONMENTAL PRODUCT DECLARATION

SPM PROTECTION AND DECORATION PANELS

PVC CLADDING, PROTECTION AND DECORATION PANELS FOR INSIDE WALLS

PVC wall cladding, protection, and decoration panels for inside walls

Because we think actions speak louder than words, SPM Gerflor Group has always been willing to act and to develop wall covering solutions that meet the most challenging requirements in term of design, durability, easy installation, …
When it comes to sustainability, we also set ourselves to the highest standards. We believe in developing great products that not only perform, but also contribute to achieving high indoor air quality and top contribution to all green building certification schemes.

Protection and decoration panels collection:

- According to ISO 22196 and ISO 8690, they have, respectively, anti-bacterial activity against MRSA of 99% and excellent decontamination of surface.
- The products emission rate of volatile organic compounds are < 15 µg/m³ (TVOC after 28 days – ISO 16000 -6).
- They have the A+ and Greenguard Glod certifications.

SPM protection and decoration panels are developed with a view to optimize the environmental impact at every stage of the product's life. This includes assessment of the manufacture, installation, ongoing maintenance, eventual uplift, and recycling of the products. As part of this commitment, Gerflor has decided to take a leadership position by publishing a third party independently verified EPD for each of its product ranges.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

PVC cladding, protection, and decoration panels for inside walls
SPM Gerflor group

According to ISO 14025, EN 15804+A2

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Solutions https://www.ul.com/ 333 Pfingsten Road, Northbrook, IL 60611 https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.7 March 2022
MANUFACTURER NAME AND ADDRESS	SPM International S.A.S - Gerflor Groupe, 16 rue Isabelle Eberhardt, 31200 Toulouse (France)
DECLARATION NUMBER	4790737602.101.1
DECLARED PRODUCTS & FUNCTIONAL UNIT OR DECLARED UNIT	Decochoc, Decotrend, Decowood, Decoclean, Decocare, Decofresc, Decoprint and their H2O variant. The functional unit used for this study is 1m² of PVC wall cladding, protection and decoration panels, for a 25 years service life, and for a building estimated life of 75 years.
REFERENCE PCR AND VERSION NUMBER	CEN standard EN 15804+A2 serves as the core PCR PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0, Dated March 28, 2022 UL Environnment. PCR - Part B: Wall and Door Protection EPD Requirements, First Edition, Dated May 22, 2019. UL Environnment,
DESCRIPTION OF PRODUCT APPLICATION/USE	The products are classified in accordance with EN 17104 to protect walls from possible impacts, and facilitate cleaning. Construction Specification Institute (CSI) Masterformat code : 10 26 23 Protective Wall Covering
PRODUCT RSL DESCRIPTION (IF APPL.)	The stated RSL is 25 years. The manufacturer has provided this service life on the basis of his experience of wall protection panels. The ESL is 75 years, so two replacements are requierd.
MARKET OF APPLICABILITY	Europe (BtoB)
DATE OF ISSUE	July 15, 2024
PERIOD OF VALIDITY	5 years
EPD TYPE	Product-specific
RANGE OF DATASET VARIABILITY	Seven products are considered in this EPD. The declarated product is an average wheited product. The products included in the grouping differ by no more than 10% for any environnemental impact indicator.
EPD SCOPE	Cradle to Grave
YEAR(S) OF REPORTED PRIMARY DATA	2022
LCA SOFTWARE & VERSION NUMBER	Simapro 9
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent 3.8 – allocution cut-off by classification
LCIA METHODOLOGY & VERSION NUMBER	Method Ev-DEC EN 15804 A2 EF3.1 ei3.8 SP9.4 EPD V1.12 (EVEA)

The PCR review was conducted by:	UL Solutions PCR Review Panel epd@ul.com
This declaration was independently verified by a competent third party in accordance with EN 15804+A2, UL Part A, and ISO 14025:2006 : ☐ INTERNAL ☒EXTERNAL	Cooper McCollum, UL Solutions Maggie Wildnauer, WAP Sustainability
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	EVEA

LIMITATIONS

Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

1. Product Definition and Information

1.1. Description of Company/Organization

The products are commercialized by SPM Gerflor Group, and made in Toulouse Manufacturing Plant (France).

1.2. Product Description

Product Identification

Product Designation: “PVC cladding, protection and decoration panels for inside walls - SPM”

This environmental product declaration covers SPM collection of PVC cladding, protection and decoration panels for inside walls. The studied products are stiff PVC panels, stabilized with CaZn and without heavy metals. Their main function is the protection of inside walls against mechanical and chemical assaults. They are mainly used in the health sector (Hospitals, nursing homes, …). In addition to their aesthetic feature, they have the abelity of protecting walls against impacts, and are allowing an easy cleaning. Several references with different shades are available in order to facilitate the support position for the visually impaired, by reinforcing the differentiation of shade between these products and the handrails.

The standard dimensions are:

- 2mm thick;
- 3m long;
- 1.30m wide.

Product Specification

The products considered in this EPD meet or exceed one of the following Technical Specifications:
The products meet requirements of the standard EN 17104 – Termoplastics rigid protective wallcovering panels for internal use in buildings - Performance characteristics
Specification Fire Testing:

- Ignitability of products test according to NF EN 11925-2 (2013)
- Reaction to fire test according to NF EN 13823 (2015)

All products have a fire resistance of Bs2d0 (M1)

The product contains no substance listed in the “Candidate List of Substances of Very High Concern for authorisation” with a content exceeding the limits for registration with the European Chemicals Agency.

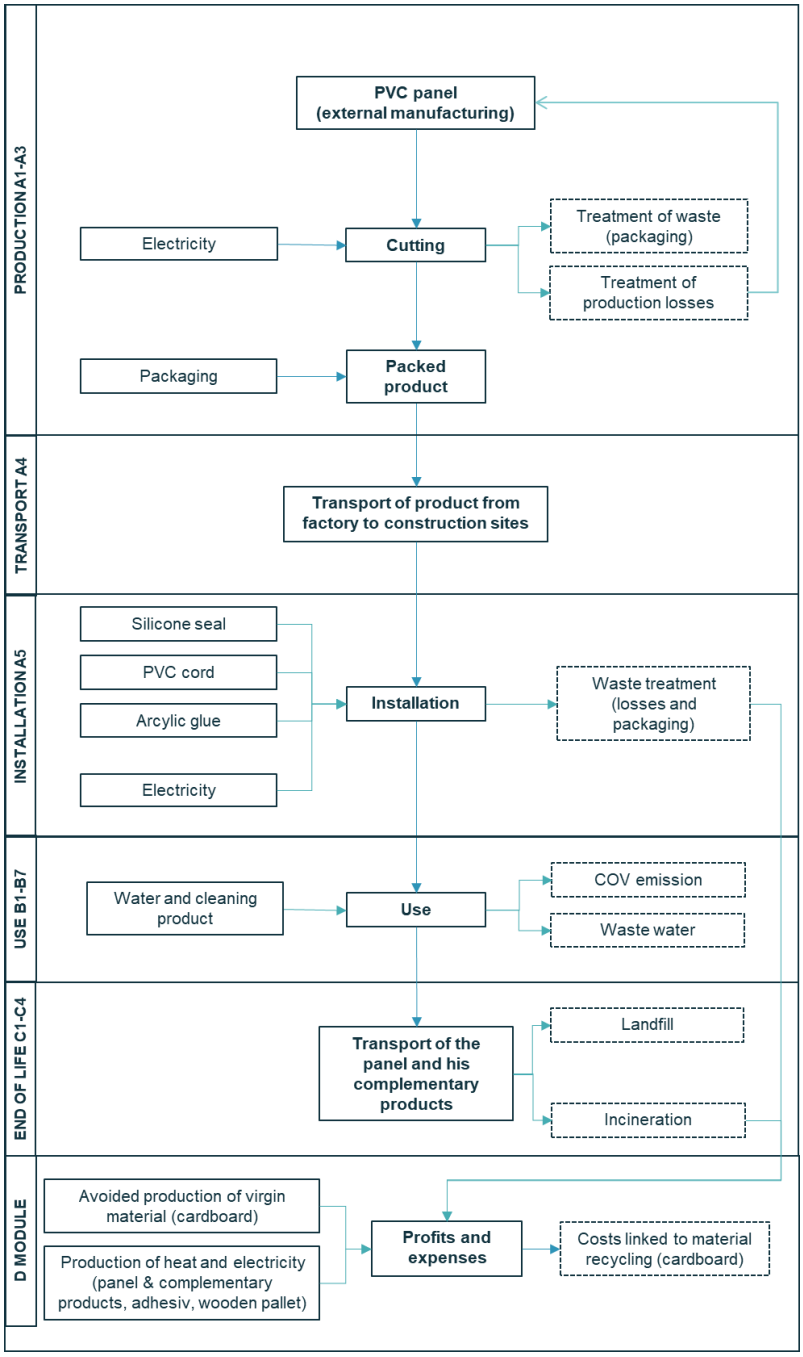
There isn’t any SDS for this product.

Average product

The average product was calculated as the gross average of the following 3 products:
- Chalk: corresponds to the panel representing the highest number of sales, and with the most opacifier;
- Poppy: corresponds to the product with the least opacifiers and the most pigments;
- Aluminum cladding: panel with a protective and decorative film.

Flow Diagram

Figure 1: Flow product diagram



1.3. Application

The products are classified in accordance with EN 17104 to ensure the protection of inside walls from impacts.

1.4. Declaration of Methodological Framework

This EPD covers the entire life cycle of the products from cradle to grave (modules A1 to C4) excluding modules for which there are no inputs/outputs. No known flows are deliberately excluded from this EPD.

For these products, the stated RSL is 25 years. The manufacturer has provided this service life on the basis of his experience of PVC panels for walls manufacture and supply. This RSL is applicable as long as the product use complies with that defined by ISO 14041 in accordance with the product's classification.

The study targets 3 families of products that show variations mainly in their quantities of opacifier, pigment and in the presence or not of finishing films. These families are covered by the following business references: Decochoc, Decoclean, Decocare, Decoprint, Decotrend and Decowood. The average product was determined by making the gross average of the 3 families.

Environnemental impacts of each family have been compared to the average product, and are considered as homogeneous, with a weighted coefficient of variation less than 10% for each impact category.

1.5. Technical Requirements

Table 1: technical data

Name	Value	Unit
Product Thickness	2	mm
Product Weight	2.55	kg/m²
Density	1378	kg/m^3

Table 2: technical data – Wall and door protection products

Specification characteristic	Test method	Test result
Fire performance	ASTM E84	A
Chemical and stain resistance	ASTM D-543	Excellent
Resistance to household chemicals	ASTM D1308	Excellent
Antibacterial activity	ISO 22196	> 99% Inhibits growth
Decontamination of surface	ISO 8690	Excellent
Migration of specific metals	EN 12149-A	< 2
Vinyl chloride	EN 12149-B	Not detectable
Formaldehyde	EN 12149-C	Not detectable
TVOC emission – After 28 days	EN 16000-6	< 15 µg/m3
Puncture impact resistance	EN ISO 6603-1	> 15 J
Impact resistance Charpy	ISO 179-1	> 30 kJ/m²

1.6. Properties of Declared Product as Delivered

The product declared in this document complies with the following codes or regulations:

- EN 17104
- Bs2d0 (test report N° N°P199468 from LNE)

The standard dimensions of the panel are 3m * 1m30.

1.7. Material Composition

Table 3: Material content

Component	Mass %
PVC panel	100%

The product is mainly composed of PVC, organic fillers and pigments.

1.8. Manufacturing

SPM wall protection panel collections are made in the SPM manufacturing plant in Toulouse, in France.

The panels arrive in the order-picking site in their standard dimension. Some of them are cut to meet custom dimensions before beeing deliverd to construction sites. Complementary installation products (glue, joint and cord) are delivered to the site with the panels, their impact is therefore allocated to phase A3.

1.9. Packaging

The products are packed in a cardboard box sealed with adhesive and placed on wooden pallet.

As describe in UL Part A Requirements, the packaging waste scenario for European market is:

- 77% recycling, 16% landfilling and 7% incineration for the carboard box
- 25% recycling, 55% landfilling and 20% incineration for the wooden pallet
- 41% recycling, 39% landfilling and 31% incineration for the adhesive (plastic)

1.10. Transportation

SPM PVC panels for inside walls are sent from SPM's factory in Toulouse, to the construction sites in Europe. The distance was calculated by taking the weighted average of the distances per country, based on sales volumes.

1.11. Product Installation

Installation scenario

There are three possibles ways to install the product, as described in the following table:

Table 4: Possible scenarios of installation

Scenario's name	% of installed products	Complementary laying products
Edge-to-edge laying	78.4%	Glue (2.85E-01 kg/m²)
Laying with joints	20.6%	Glue and Silicon joint (5.67E-03 kg/m²)
Heat-welded installation	1%	Glue and PVC cord (5.33E-03 kg/m²)

Therefore, the following fictive average scenario has been used for the modelling:

Table 5: Average scenario of installation

Complemantary product / Energy consumption	Unit	Quantity
Acrylic binder	kg/m²	2.85E-01
Silicon joint	kg/m²	1.17E-03
PVC cord	kg/m²	5.33E-05
Electricity	kWh/m²	9.88E-05

Installation losses

During the installation approximately 5% of the material is lost as off-cuts. According to the UL Environment Part A PCR, product disposal assumption for Europe should be 50% recycling, 37% landfilled and 13% incinerated. In the case of PVC wall protection panels, there is no significant recycling processes to consider a recycling rate. Thus, the process is 74% landfilled and 26% incinerated.

1.12. Use

B1 : Use

COV emissions during the product's life are taken into account.

B2 : Maintenance

As cleaning requirements depend on the application (operating theatre, bedrooms, emergency room, etc.), an average scenario was determined based on the manufacturer's recommendations and those of regional health agencies. The following scenario has been used for the study : 2 wet cleaning by hand with water and detergent per year.

1.13. Reference Service Life and Building Estimated Service Life

For this product, the stated RSL is 25 years and the building estimated service life (ESL) is 75 years. The manufacturer has provided this service life on the basis of his experience of manufacture and supply. The number of replacements necessary to fulfill the required performance and functionality over the building Estimated Service Life of 75 years is two.

1.14. Reuse, Recycling, and Energy Recovery

There are no known reuse channels, or specific data for the recycling of this product in Europe. In general the end-of-life scenarios listed below are applied.

1.15. Disposal

It is assumed that the product is removed by hand, without any energy consumption.

According to the PCR UL Part A, généric disposal pathways for Europe is 50% recycling, 37% landfill and 13% incineration. However, as no specific information is available on recycling possibilities for bonded rigid PVC panels, it was assumed that 26% of the product would be incinerated and 74% landfilled.

The panel and his complemenatry products are beeing transported by truck, between the construction site and the waste treatment facilities (incineration or landfill). A distance of 161 km is considered.

2. Life Cycle Assessment Background Information

A full Life Cycle Assessment has been performed according to ISO 14040, ISO 14044 and in compliance with EN15804+A2.

2.1. Functional or Declared Unit

The functional unit is one square meter of installed product. The reference service life considered is 25 years.

Table 6: Functional Unit

	Value	Unit
Functional Unit	1	m²
Mass	2.55	kg
Thickness	2	mm

2.2. System Boundary

EPD is declared from cradle to grave, including the following stages:

A1 – A3: includes the provision and manufacturing of the raw material (PVC panel) and his packaging, transport to the production site and energy consumption during the manufacturing of the product, as well as processing of waste generated by the factory.

A4 – A5: includes the transport from the factory to the final customer, packaging of the final product and the installation of the product, as well as all consumables and energy required and processing of waste generated during the installation.

B1 – B7: includes provision and transport of all materials, products and services related to the use phase of the product, as well as their related energy and water consumption, and the processing of any resulting waste.

C1 – C4: includes provision and transport of all materials, products and services related to the end of life phase of the product, including energy and water consumption, as well as the end of life processing of the product.

D: includes benefits coming from the wastes' end of life.

Table 7: Scope of the study

	Production Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits & loads beyond syst. Bound.
	Raw material supply	Transport to manufacturer	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use during product use	Operational water use during product use	Deconstruction	Transport	Waste processing	Disposal	Reuse, recovery or recycling potential
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Accounted for:	X	X	X	X	X	X	X	X*	X *	X	X*	X*	X*	X	X*	X	X

*module has been considered but has no associated inputs/outputs, therefore does not appear in the results.

2.3. Product specific calculations for use and end of life

As cleaning requirements depend on the application (operating theatre, bedrooms, emergency room, etc.), an average scenario was determined based on the manufacturer's recommendations and those of regional health agencies. The following scenario has been used for the study:

Table 8: Product cleaning assumptions

	Wall and Door Protection Products
Cleaner use and frequency	2 wet cleaning per year: 50 ml of 25% detergent product such as Surfanio Premium, with assumed evaporation as emissions to air.

2.4. Estimates and Assumptions

Estimates and assumptions are made for transport, installation and deconstruction procedure. Details are provided in section “LCA: scenarios and additional technical information”.

Transport distances have been calculated from the production site to the construction sites of the destination country.

Transport distance from building site to the end of life treatement center is considered with a distance of 161 km, according to PCR part B.

2.5. Units

SI units are required for all LCA results.

2.6. Cut-off Rules

The cut -off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows per module shall be a maximum of 5% of energy usage and mass.

For this study, all input and output flows have been considered. Raw materials are included as per the product composition provided by the manufacturer and the packaging of the final product. Energy and water consumptions have also been considered at 100% according to the data provided.

No known flows are deliberately excluded from this EPD.

2.7. Data Sources

As a general rule, specific data derived from specific production processes or average data derived from specific production processes have been used as the first choice as a basis for calculating an EPD.

To model the life cycle of the product in question, the software SimaPro 9, developed by PRé, has been used in conjunction with the LCA database ecoinvent v3.8, in accordance with EN 14040.

2.8. Data Quality

The requirements for data quality and LCA data are in accordance with the specifications of the PCR.

Temporal Coverage – producer specific data is averaged over 1 year of production and from within the last 5 years (2022) except for the energy mix data, that were collected over 6 months, but whose impact remains very low. Generic data is taken from the ecoinvent 3.8 database, the entirety of which was updated in 2021. Inputs and outputs from the system are accounted for over a period of 100 years from the year for which the data set is deemed relevant.

Technological Coverage – the technological coverage of the data reflects the physical reality of the declared product.

Geographical Coverage – whenever possible, country specific data reflecting the reality of the SPM supply chain and of his suppliers has been used. If country specific data is unavailable, European regional data is used in preference to global data sources.

2.9. Period under Review

Data have been reviewed for the production year 2022.

2.10. Allocation

Allocations when using secondary materials as raw materials: not concerned here.

Allocations in the plant (differentiation from other products manufactured in the plant):

The overall values for the factory's material and energy consumptions during a period of one year have been divided by the annual production of each product to supply a value per square meter of the panels produced. All factory data is measured in square meters, and it is assumed that the process consumptions are governed by area of panel processed rather than mass.

Allocation of multi-input processes if performed during modelling: not concerned here.

Allocations of reuse, recycling and energy recovery: not concerned here.

2.11. Comparability and benchmarking (optional)

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804+A2/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

3. Life Cycle Assessment Scenarios

The valid scenarios of life cycle assessment for European market are described in the following tables:

Table 9. Transport to the building site for European market (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 6	
Transport distance	715	km
Capacity utilization (including empty runs, mass based	50	%
Gross density of products transported	1378	kg/m^3
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m^3
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-

As there are almost no empty returns from the lorries transporting the product to the worksites, the real loading rate is at least 50%. However, as this impact is very low comparing to the total life cycle, the default value of 36% contained in the ecoinvent data has been retained for the study.

Table 10. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	Acrylic glue: 2.85E-01 PVC cord: 5.34E-05 Silicon joint: 1.17E-03	kg/m²
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m^3
Other resources	-	Kg
Electricity consumption	9.88E-05	kWh/m²
Other energy carriers	-	MJ
Product loss per functional unit	5	%
Waste materials at the construction site before waste processing, generated by product installation	Waste wood pallets: 1.94E-01 Cardboard waste: 1.43E-01 Adhesive waste: 3.00E-03 Product losses: 3.50E-02	Kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	Collection for recycling: 1.59E-01 Collection for incineration: 4.93E-02 Collection for landfill: 1.67E-01	Kg
Biogenic carbon contained in packaging	1.70E-01	kg CO_2/m²
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	-	µg/m^3

Table 11. Reference Service Life

NAME	VALUE	UNIT
RSL	25	years
Declared product properties (at the gate) and finishes, etc.	Products in accordance with standard EN 17104	-
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Products in accordance with EN 17104 and technical prescription of the manufacturer	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Assumed to be installed according to the manufacturer's instructions	-
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	-	-
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Use conditions in accordance with manufacturer prescriptions: see technical datasheet n°12/19-1782_V1 and installation guide	-
Use conditions, e.g. frequency of use, mechanical exposure.	Use conditions in accordance with manufacturer prescriptions: see technical datasheet n°12/19-1782_V1 and installation guide	-
Maintenance, e.g. required frequency, type and quality of replacement components	Maintenance scenario is defined in the table 13.	-

Table 12. Use (B1)

NAME	VALUE	UNIT
COV emissions during service life	1.01	g/m²

Table 13. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	Wet cleaning: 2/year	-
Maintenance cycle	50	Number/ RSL
Maintenance cycle	150	Number/ ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	0.1	L/year
Ancillary materials specified by type (detergent)	2.5E-04	kg/year
Other resources	-	kg
Energy input, specified by activity, type and amount	-	kWh/year
Other energy carriers specified by type	-	kWh
Power output of equipment	-	kW
Waste materials from maintenance (specify materials)	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	-	

Table 14. Repair (B3)

No data for given table

Table 15. Replacement (B4)

NAME	VALUE	UNIT
Reference Service Life	25	Years
Replacement cycle	2	(ESL/RSL)-1
Energy input, specified by activity, type and amount	1.98E-04	kWh
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)	-	m^3
Ancillary materials specified by type and amount (e.g. cleaning agent)	Acrylic binder: 5.72E-01	kg
Replacement of worn parts, specify parts/materials	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development, e.g. frequency and time period of use_	-	As appropriate

Table 16. Refurbishment (B5)

No data for given table

Table 17. Operational energy use (B6) and Operational water use (B7)

No data for given table

Table 18. End of life (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Product are carried out by hand, and waste transport is made by truck (16-32 metric ton Euro6). A 161km distance to the treatment center is considered. Three scenarios are considered: - 74% landfill and 26% incineration - 100% landfill - 100% incineration	
Collection process (specified by type)	Collected separately	-	kg
	Collected with mixed construction waste	2.84E+00	kg
Recovery for mix scenario (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	2.10E+00	kg
	Incineration	-	kg
	Incineration with energy recovery	7.40E-01	kg
	Energy conversion	-	

	efficiency rate		
Recovery for 100% landfill scenario (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	2.84E+00	kg
	Incineration	-	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Recovery for 100% incineration scenario (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	-	kg
	Incineration	-	kg
	Incineration with energy recovery	2.84E+00	kg
	Energy conversion efficiency rate	-	
Recovery for 100% recycling scenario (specified by type)	Reuse	-	kg
	Recycling	2.84E+00	kg
	Landfill	-	kg
	Incineration	-	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Disposal (specified by type)	Product or material for final deposition	-	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO_2

Three different end-of-life scenarios are included in this study :

- The mix scenario, corresponding to european default scenario of a plastic, in which the product is landfilled at 74% and incinerated at 26% (according to PCR UL). Recycling rate is not considered in this scenario because there is no significant end-of-life recycling sector for PVC panels in Europe.
- The 100% landfill scenario, corresponding to french scenario (75% of the products are sold on the french market) according to NF EN 15804+A2/CN.
- The 100% incineration scenario, corresponding to the most impactant scenario.

Table 19. Reuse, recovery and/or recycling potentials (D), relevant scenario information

NAME	VALUE	UNIT
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	-	MJ
Net energy benefit from thermal and electrical energy due to treatment of waste declared as exported energy in C4 (R<0.6)	7.97E+00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	-	MJ
Process and conversion efficiencies	Exported energies are derived from the ecoinvent documentation used.	
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);		

4. Life Cycle Assessment Results

The following results are given for the RSL of 25 years, and for the ESL of 75 years. In order to get the results for the ESL of 75 years, the results of B1, B2 and D were multiplied by three, and B4 was added (the result of B4 is two times the results of A and C), as two replacements are considered.

4.1. Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The results of these environmental impact indicators should be used with caution because the uncertainties in the results are high or because experience with the indicator is limited.

The indicators concerned are the following:
- Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)
- Abiotic depletion potential for fossil resources (ADP-fossil)
- Water (user) deprivation potential, deprivation-weighted water consumption (WDP)
- Ecotoxicity, freshwater
- Human toxicity, cancer
- Human toxicity, non-cancer
- Land use related impacts

Table 20. Environmental impacts over the RSL of 25 years – End of life 74% incineration / 26% landfill

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.64E-02	1.95E+00	-8.04E-01
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	3.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.63E-02	1.95E+00	-7.71E-01
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	8.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-05	9.13E-05	-3.19E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	2.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-05	5.20E-05	-4.36E-04
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	2.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-08	2.25E-08	-6.61E-08
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	2.14E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.59E-03	-2.83E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	5.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07	1.52E-06	-3.60E-05
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	8.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-05	8.76E-04	-3.50E-04
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-04	8.07E-03	-4.32E-03
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	2.37E-04	1.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-04	1.92E-03	-1.62E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	2.49E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-07	6.82E-07	-1.38E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	5.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	1.02E+00	-1.35E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	1.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.09E-03	3.11E-02	-8.45E-02
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	1.88E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-09	8.93E-09	-1.73E-08
Ionising radiation[1] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-03	3.72E-03	-6.18E-02
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	1.93E-03	9.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-01	1.28E+01	-3.01E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	4.55E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-11	3.76E-10	-5.85E-10
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	5.15E-11	1.71E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-10	5.11E-09	-7.65E-09
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	9.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.06E-01	1.35E+00	-5.69E+00

[1] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 21. Environmental impacts over the RSL of 25 years – End of life 100% landfill

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.64E-02	1.52E-01	-8.04E-01
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	3.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.63E-02	1.52E-01	-7.71E-01
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	8.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-05	2.16E-05	-3.19E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	2.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-05	4.58E-06	-4.36E-04
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	2.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-08	6.50E-09	-6.61E-08
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	2.14E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.56E-04	-2.83E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	5.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07	1.51E-07	-3.60E-05
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	8.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-05	1.21E-04	-3.50E-04
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-04	6.30E-04	-4.32E-03
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	2.37E-04	1.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-04	2.18E-04	-1.62E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	2.49E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-07	6.18E-08	-1.38E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	5.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-1.35E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	1.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.09E-03	2.26E-03	-8.45E-02
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	1.88E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-09	3.39E-09	-1.73E-08
Ionising radiation[2] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-03	2.17E-03	-6.18E-02
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	1.93E-03	9.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-01	7.12E+00	-3.01E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	4.55E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-11	1.47E-11	-5.85E-10
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	5.15E-11	1.71E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-10	1.37E-09	-7.65E-09
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	9.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.06E-01	1.22E+00	-5.69E+00

[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 22. Environmental impacts over the RSL of 25 years – End of life 100% incineration

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.64E-02	6.93E+00	-8.04E-01
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	3.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.63E-02	6.93E+00	-7.71E-01
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	8.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-05	2.68E-04	-3.19E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	2.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-05	1.82E-04	-4.36E-04
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	2.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-08	6.17E-08	-6.61E-08
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	2.14E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	5.51E-03	-2.83E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	5.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.77E-07	5.27E-06	-3.60E-05
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	8.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-05	2.90E-03	-3.50E-04
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-04	2.86E-02	-4.32E-03
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	2.37E-04	1.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-04	6.55E-03	-1.62E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	2.49E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-07	2.38E-06	-1.38E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	5.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	2.12E+00	-1.35E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	1.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.09E-03	1.11E-01	-8.45E-02
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	1.88E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-09	2.13E-08	-1.73E-08
Ionising radiation[3] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-03	5.98E-03	-6.18E-02
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	1.93E-03	9.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-01	2.18E+01	-3.01E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	4.55E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-11	1.39E-09	-5.85E-10
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	5.15E-11	1.71E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-10	1.44E-08	-7.65E-09
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	9.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.06E-01	4.83E-01	-5.69E+00

[3] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 23. Environmental impacts over the RSL of 75 years – End of life 74% incineration / 26% landfill

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	1.15E-01	0.00E+00	1.88E+01	0.00E+00	0.00E+00	0.00E+00	6.64E-02	1.95E+00	-2.41E+00
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	1.14E-01	0.00E+00	1.86E+01	0.00E+00	0.00E+00	0.00E+00	6.63E-02	1.95E+00	-2.31E+00
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	2.47E-04	0.00E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	2.10E-05	9.13E-05	-9.57E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	7.88E-05	0.00E+00	3.35E-02	0.00E+00	0.00E+00	0.00E+00	2.71E-05	5.20E-05	-1.31E-03
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	6.98E-08	0.00E+00	5.72E-06	0.00E+00	0.00E+00	0.00E+00	1.55E-08	2.25E-08	-1.98E-07
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	6.43E-04	0.00E+00	9.52E-02	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.59E-03	-8.48E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	1.75E-05	0.00E+00	5.73E-04	0.00E+00	0.00E+00	0.00E+00	4.77E-07	1.52E-06	-1.08E-04
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	2.64E-04	0.00E+00	1.57E-02	0.00E+00	0.00E+00	0.00E+00	3.77E-05	8.76E-04	-1.05E-03
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	9.91E-04	0.00E+00	1.45E-01	0.00E+00	0.00E+00	0.00E+00	4.21E-04	8.07E-03	-1.30E-02
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	7.11E-04	3.15E-04	0.00E+00	5.04E-02	0.00E+00	0.00E+00	0.00E+00	1.62E-04	1.92E-03	-4.87E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	7.46E-06	0.00E+00	2.36E-04	0.00E+00	0.00E+00	0.00E+00	2.43E-07	6.82E-07	-4.15E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	1.67E+00	0.00E+00	3.41E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	1.02E+00	-4.05E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	5.91E-02	0.00E+00	1.83E+01	0.00E+00	0.00E+00	0.00E+00	3.09E-03	3.11E-02	-2.54E-01
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	5.65E-09	0.00E+00	7.92E-07	0.00E+00	0.00E+00	0.00E+00	5.37E-09	8.93E-09	-5.18E-08
Ionising radiation[4] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	3.07E-03	0.00E+00	8.09E-01	0.00E+00	0.00E+00	0.00E+00	4.40E-03	3.72E-03	-1.85E-01
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	5.80E-03	2.90E+00	0.00E+00	1.42E+02	0.00E+00	0.00E+00	0.00E+00	3.53E-01	1.28E+01	-9.03E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	1.36E-10	0.00E+00	2.67E-08	0.00E+00	0.00E+00	0.00E+00	2.56E-11	3.76E-10	-1.75E-09
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	1.55E-10	5.13E-09	0.00E+00	3.45E-07	0.00E+00	0.00E+00	0.00E+00	8.04E-10	5.11E-09	-2.29E-08
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	2.81E-01	0.00E+00	2.11E+02	0.00E+00	0.00E+00	0.00E+00	7.06E-01	1.35E+00	-1.71E+01

[4] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 24. Environmental impacts over the RSL of 75 years – End of life 100% landfill

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	1.15E-01	0.00E+00	1.52E+01	0.00E+00	0.00E+00	0.00E+00	6.64E-02	1.52E-01	-2.41E+00
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	1.14E-01	0.00E+00	1.50E+01	0.00E+00	0.00E+00	0.00E+00	6.63E-02	1.52E-01	-2.31E+00
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	2.47E-04	0.00E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	2.10E-05	2.16E-05	-9.57E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	7.88E-05	0.00E+00	3.34E-02	0.00E+00	0.00E+00	0.00E+00	2.71E-05	4.58E-06	-1.31E-03
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	6.98E-08	0.00E+00	5.69E-06	0.00E+00	0.00E+00	0.00E+00	1.55E-08	6.50E-09	-1.98E-07
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	6.43E-04	0.00E+00	9.23E-02	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.56E-04	-8.48E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	1.75E-05	0.00E+00	5.71E-04	0.00E+00	0.00E+00	0.00E+00	4.77E-07	1.51E-07	-1.08E-04
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	2.64E-04	0.00E+00	1.42E-02	0.00E+00	0.00E+00	0.00E+00	3.77E-05	1.21E-04	-1.05E-03
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	9.91E-04	0.00E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	4.21E-04	6.30E-04	-1.30E-02
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	7.11E-04	3.15E-04	0.00E+00	4.70E-02	0.00E+00	0.00E+00	0.00E+00	1.62E-04	2.18E-04	-4.87E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	7.46E-06	0.00E+00	2.34E-04	0.00E+00	0.00E+00	0.00E+00	2.43E-07	6.18E-08	-4.15E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	1.67E+00	0.00E+00	3.40E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-4.05E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	5.91E-02	0.00E+00	1.82E+01	0.00E+00	0.00E+00	0.00E+00	3.09E-03	2.26E-03	-2.54E-01
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	5.65E-09	0.00E+00	7.81E-07	0.00E+00	0.00E+00	0.00E+00	5.37E-09	3.39E-09	-5.18E-08
Ionising radiation[5] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	3.07E-03	0.00E+00	8.06E-01	0.00E+00	0.00E+00	0.00E+00	4.40E-03	2.17E-03	-1.85E-01
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	5.80E-03	2.90E+00	0.00E+00	1.31E+02	0.00E+00	0.00E+00	0.00E+00	3.53E-01	7.12E+00	-9.03E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	1.36E-10	0.00E+00	2.60E-08	0.00E+00	0.00E+00	0.00E+00	2.56E-11	1.47E-11	-1.75E-09
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	1.55E-10	5.13E-09	0.00E+00	3.38E-07	0.00E+00	0.00E+00	0.00E+00	8.04E-10	1.37E-09	-2.29E-08
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	2.81E-01	0.00E+00	2.11E+02	0.00E+00	0.00E+00	0.00E+00	7.06E-01	1.22E+00	-1.71E+01

[5] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Table 25. Environmental impacts over the RSL of 75 years – End of life 100% incineration

CML v4.3	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
GWP-total [kg CO2 eq.]	4.54E+00	2.76E-01	9.23E-01	3.93E-01	1.23E+00	0.00E+00	1.15E-01	0.00E+00	2.87E+01	0.00E+00	0.00E+00	0.00E+00	6.64E-02	6.93E+00	-2.41E+00
GWP - fossil [kg CO2 eq.]	4.79E+00	2.76E-01	1.53E+00	3.93E-01	2.95E-01	0.00E+00	1.14E-01	0.00E+00	2.86E+01	0.00E+00	0.00E+00	0.00E+00	6.63E-02	6.93E+00	-2.31E+00
GWP - biogenic [kg CO2 eq.]	-2.63E-01	8.72E-05	-6.08E-01	1.24E-04	9.37E-01	0.00E+00	2.47E-04	0.00E+00	1.34E-01	0.00E+00	0.00E+00	0.00E+00	2.10E-05	2.68E-04	-9.57E-02
GWP -luluc [kg de CO2 eq.]	1.17E-02	1.13E-04	4.11E-03	1.60E-04	5.87E-04	0.00E+00	7.88E-05	0.00E+00	3.37E-02	0.00E+00	0.00E+00	0.00E+00	2.71E-05	1.82E-04	-1.31E-03
ODP [kg CFC 11 eq]	2.23E-06	6.45E-08	3.34E-07	9.19E-08	1.06E-07	0.00E+00	6.98E-08	0.00E+00	5.80E-06	0.00E+00	0.00E+00	0.00E+00	1.55E-08	6.17E-08	-1.98E-07
AP [mole H+ eq]	2.90E-02	7.90E-04	1.32E-02	1.13E-03	1.72E-03	0.00E+00	6.43E-04	0.00E+00	1.03E-01	0.00E+00	0.00E+00	0.00E+00	1.90E-04	5.51E-03	-8.48E-03
EP- freshwater [kg PO4 eq]	1.96E-04	1.98E-06	7.37E-05	2.83E-06	1.02E-05	0.00E+00	1.75E-05	0.00E+00	5.81E-04	0.00E+00	0.00E+00	0.00E+00	4.77E-07	5.27E-06	-1.08E-04
EP- marine [kg N eq]	4.14E-03	1.57E-04	2.03E-03	2.24E-04	3.76E-04	0.00E+00	2.64E-04	0.00E+00	1.97E-02	0.00E+00	0.00E+00	0.00E+00	3.77E-05	2.90E-03	-1.05E-03
EP- terrestrial [mole N eq]	4.01E-02	1.75E-03	1.69E-02	2.49E-03	2.62E-03	0.00E+00	9.91E-04	0.00E+00	1.86E-01	0.00E+00	0.00E+00	0.00E+00	4.21E-04	2.86E-02	-1.30E-02
POCP [kg NMVOC eq]	1.50E-02	6.73E-04	5.55E-03	9.58E-04	9.66E-04	2.37E-04	3.15E-04	0.00E+00	5.96E-02	0.00E+00	0.00E+00	0.00E+00	1.62E-04	6.55E-03	-4.87E-03
ADP-e [kg Sb eq]	8.88E-05	1.01E-06	2.16E-05	1.44E-06	4.12E-06	0.00E+00	7.46E-06	0.00E+00	2.39E-04	0.00E+00	0.00E+00	0.00E+00	2.43E-07	2.38E-06	-4.15E-06
ADP-f [MJ, LHV]	1.22E+02	4.22E+00	3.02E+01	6.01E+00	6.41E+00	0.00E+00	1.67E+00	0.00E+00	3.43E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	2.12E+00	-4.05E+01
WDP [m3 of deprivation eq in the world]	7.24E+00	1.28E-02	1.52E+00	1.83E-02	3.11E-01	0.00E+00	5.91E-02	0.00E+00	1.84E+01	0.00E+00	0.00E+00	0.00E+00	3.09E-03	1.11E-01	-2.54E-01
Particulate matter [Incidence of disease]	2.09E-07	2.24E-08	1.02E-07	3.18E-08	1.66E-08	0.00E+00	5.65E-09	0.00E+00	8.17E-07	0.00E+00	0.00E+00	0.00E+00	5.37E-09	2.13E-08	-5.18E-08
Ionising radiation[6] [kBq235U éq]	2.51E-01	1.83E-02	8.46E-02	2.61E-02	1.68E-02	0.00E+00	3.07E-03	0.00E+00	8.13E-01	0.00E+00	0.00E+00	0.00E+00	4.40E-03	5.98E-03	-1.85E-01
Ecotoxicity, freshwater [CTUe]	3.56E+01	1.47E+00	1.63E+01	2.09E+00	2.57E+00	1.93E-03	2.90E+00	0.00E+00	1.60E+02	0.00E+00	0.00E+00	0.00E+00	3.53E-01	2.18E+01	-9.03E+00
Human toxicity, cancer [CTUh]	6.20E-09	1.06E-10	6.04E-09	1.52E-10	4.77E-10	0.00E+00	1.36E-10	0.00E+00	2.88E-08	0.00E+00	0.00E+00	0.00E+00	2.56E-11	1.39E-09	-1.75E-09
Human toxicity, non-cancer [CTUh]	1.14E-07	3.35E-09	3.77E-08	4.77E-09	6.47E-09	5.15E-11	5.13E-09	0.00E+00	3.64E-07	0.00E+00	0.00E+00	0.00E+00	8.04E-10	1.44E-08	-2.29E-08
Land use related impacts [No dimension]	4.07E+01	2.94E+00	5.15E+01	4.19E+00	4.03E+00	0.00E+00	2.81E-01	0.00E+00	2.09E+02	0.00E+00	0.00E+00	0.00E+00	7.06E-01	4.83E-01	-1.71E+01

[6] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

4.2. Life Cycle Inventory Results

Table 26. Resources, waste categories and outgoing flows over the ESL of 25 years – End of life 74% incineration / 26% landfill

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	6.10E-02	-4.40E-01
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	6.10E-02	-1.63E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	6.22E+00	-1.32E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.20E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	1.02E+00	-1.32E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	5.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	1.69E-03	-5.90E-03
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	2.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.43E-04	2.62E-02	-1.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	1.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-02	2.13E+00	-1.52E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	9.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.85E-06	4.51E-06	-5.29E-05
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.54E-08	2.67E-07	-1.02E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	8.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-06	4.24E-06	-4.27E-05
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [7] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	0.00E+00
TPE [8] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	5.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+00	1.08E+00	-1.34E+01

[7] EE = Exported Energy
[8] TPE = Total Primary Energy

Table 27. Resources, waste categories and outgoing flows over the ESL of 25 years – End of life 100% landfill

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	2.08E-02	-4.40E-01
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	2.08E-02	-1.63E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-1.32E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-1.32E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	5.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	5.94E-04	-5.90E-03
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	2.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.43E-04	5.42E-04	-1.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	1.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-02	2.10E+00	-1.52E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	9.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.85E-06	3.04E-06	-5.29E-05
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.54E-08	5.50E-08	-1.02E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	8.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-06	2.98E-06	-4.27E-05
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [9] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE [10] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	5.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+00	4.91E-01	-1.34E+01

[9] EE = Exported Energy
[10] TPE = Total Primary Energy

Table 28. Resources, waste categories and outgoing flows over the ESL of 25 years – End of life 100% incineration

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	1.55E-01	-4.40E-01
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	1.55E-01	-1.63E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	7.32E+00	-1.32E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.20E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	5.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	2.12E+00	-1.32E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	5.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	4.21E-03	-5.90E-03
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	2.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.43E-04	9.87E-02	-1.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	1.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-02	9.40E-02	-1.52E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	9.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.85E-06	5.63E-06	-5.29E-05
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.54E-08	8.14E-07	-1.02E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	8.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-06	4.82E-06	-4.27E-05
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [11] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	0.00E+00
TPE [12] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	5.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E+00	2.27E+00	-1.34E+01

[11] EE = Exported Energy
[12] TPE = Total Primary Energy

Table 29. Resources, waste categories and outgoing flows over the ESL of 75 years – End of life 74% incineration / 26% landfill

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	7.48E-02	0.00E+00	2.32E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	6.10E-02	-1.32E+00
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	6.02E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	7.48E-02	0.00E+00	2.92E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	6.10E-02	-4.90E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	1.67E+00	0.00E+00	2.51E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	6.22E+00	-3.96E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	8.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.20E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	1.67E+00	0.00E+00	3.39E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	1.02E+00	-3.96E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	1.54E-03	0.00E+00	2.62E-01	0.00E+00	0.00E+00	0.00E+00	1.13E-04	1.69E-03	-1.77E-02
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	6.69E-03	0.00E+00	9.97E-01	0.00E+00	0.00E+00	0.00E+00	7.43E-04	2.62E-02	-3.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	5.11E-02	0.00E+00	2.02E+01	0.00E+00	0.00E+00	0.00E+00	5.89E-02	2.13E+00	-4.55E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	2.92E-06	0.00E+00	8.54E-04	0.00E+00	0.00E+00	0.00E+00	6.85E-06	4.51E-06	-1.59E-04
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	4.12E-07	0.00E+00	1.00E-04	0.00E+00	0.00E+00	0.00E+00	7.54E-08	2.67E-07	-3.05E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	2.51E-06	0.00E+00	7.54E-04	0.00E+00	0.00E+00	0.00E+00	6.77E-06	4.24E-06	-1.28E-04
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	3.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	7.07E-01	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	1.39E+00	0.00E+00	5.93E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-03	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	2.85E+00	0.00E+00	1.21E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-03	0.00E+00
EE [13] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	4.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	0.00E+00
TPE [14] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	1.74E+00	0.00E+00	3.68E+02	0.00E+00	0.00E+00	0.00E+00	1.03E+00	1.08E+00	-4.01E+01

[13] EE = Exported Energy
[14] TPE = Total Primary Energy

Table 30. Resources, waste categories and outgoing flows over the ESL of 75 years – End of life 100% landfill

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	7.48E-02	0.00E+00	2.32E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	2.08E-02	-1.32E+00
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	6.02E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	7.48E-02	0.00E+00	2.92E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	2.08E-02	-4.90E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	1.67E+00	0.00E+00	2.40E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-3.96E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	9.77E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	1.67E+00	0.00E+00	3.38E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	4.70E-01	-3.96E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	1.54E-03	0.00E+00	2.60E-01	0.00E+00	0.00E+00	0.00E+00	1.13E-04	5.94E-04	-1.77E-02
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	6.69E-03	0.00E+00	9.45E-01	0.00E+00	0.00E+00	0.00E+00	7.43E-04	5.42E-04	-3.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	5.11E-02	0.00E+00	2.01E+01	0.00E+00	0.00E+00	0.00E+00	5.89E-02	2.10E+00	-4.55E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	2.92E-06	0.00E+00	8.51E-04	0.00E+00	0.00E+00	0.00E+00	6.85E-06	3.04E-06	-1.59E-04
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	4.12E-07	0.00E+00	1.00E-04	0.00E+00	0.00E+00	0.00E+00	7.54E-08	5.50E-08	-3.05E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	2.51E-06	0.00E+00	7.51E-04	0.00E+00	0.00E+00	0.00E+00	6.77E-06	2.98E-06	-1.28E-04
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	3.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	7.07E-01	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	2.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-03	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	4.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-03	0.00E+00
EE [15] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	6.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE [16] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	1.74E+00	0.00E+00	3.67E+02	0.00E+00	0.00E+00	0.00E+00	1.03E+00	4.91E-01	-4.01E+01

[15] EE = Exported Energy
[16] TPE = Total Primary Energy

Table 31. Resources, waste categories and outgoing flows over the ESL of 75 years – End of life 100% incineration

Parameter	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C2	C4	D
RPRE [MJ. LHV]	6.57E+00	6.03E-02	2.66E+00	8.59E-02	2.16E+00	0.00E+00	7.48E-02	0.00E+00	2.34E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	1.55E-01	-1.32E+00
RPRM [MJ. LHV]	3.32E+00	0.00E+00	5.55E+00	0.00E+00	-5.86E+00	0.00E+00	0.00E+00	0.00E+00	6.02E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-01
RPRT [MJ. LHV]	9.89E+00	6.03E-02	8.21E+00	8.59E-02	-3.70E+00	0.00E+00	7.48E-02	0.00E+00	2.94E+01	0.00E+00	0.00E+00	0.00E+00	1.45E-02	1.55E-01	-4.90E-01
NRPRE [MJ. LHV]	7.81E+01	4.22E+00	2.54E+01	6.01E+00	4.71E+00	0.00E+00	1.67E+00	0.00E+00	2.54E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	7.32E+00	-3.96E+01
NRPRM [MJ. LHV]	4.32E+01	0.00E+00	4.23E+00	0.00E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	8.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.20E+00	0.00E+00
NRPRT [MJ. LHV]	1.21E+02	4.22E+00	2.96E+01	6.01E+00	6.15E+00	0.00E+00	1.67E+00	0.00E+00	3.41E+02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	2.12E+00	-3.96E+01
SM [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ. LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	9.06E-02	4.69E-04	3.27E-02	6.68E-04	4.57E-03	0.00E+00	1.54E-03	0.00E+00	2.67E-01	0.00E+00	0.00E+00	0.00E+00	1.13E-04	4.21E-03	-1.77E-02
HWD [kg]	2.79E-01	3.09E-03	1.68E-01	4.40E-03	1.73E-02	0.00E+00	6.69E-03	0.00E+00	1.14E+00	0.00E+00	0.00E+00	0.00E+00	7.43E-04	9.87E-02	-3.00E-02
NHWD [kg]	4.22E+00	2.45E-01	2.60E+00	3.49E-01	4.82E-01	0.00E+00	5.11E-02	0.00E+00	1.61E+01	0.00E+00	0.00E+00	0.00E+00	5.89E-02	9.40E-02	-4.55E-01
RWD [kg]	2.41E-04	2.85E-05	8.63E-05	4.06E-05	1.88E-05	0.00E+00	2.92E-06	0.00E+00	8.56E-04	0.00E+00	0.00E+00	0.00E+00	6.85E-06	5.63E-06	-1.59E-04
HLRW [kg]	3.63E-05	3.14E-07	1.10E-05	4.47E-07	1.83E-06	0.00E+00	4.12E-07	0.00E+00	1.02E-04	0.00E+00	0.00E+00	0.00E+00	7.54E-08	8.14E-07	-3.05E-05
ILLRW [kg]	2.05E-04	2.82E-05	7.53E-05	4.02E-05	1.70E-05	0.00E+00	2.51E-06	0.00E+00	7.55E-04	0.00E+00	0.00E+00	0.00E+00	6.77E-06	4.82E-06	-1.28E-04
CRU [kg]	3.08E-03	0.00E+00	1.68E-01	0.00E+00	5.97E-03	0.00E+00	0.00E+00	0.00E+00	3.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	1.69E-02	0.00E+00	5.36E-03	0.00E+00	3.31E-01	0.00E+00	0.00E+00	0.00E+00	7.07E-01	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE-Elec [MJ]	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	1.39E+00	0.00E+00	5.93E-01	0.00E+00	0.00E+00	0.00E+00	3.03E-03	0.00E+00
EE-Steam [MJ]	0.00E+00	0.00E+00	6.39E-03	0.00E+00	2.10E-01	0.00E+00	0.00E+00	2.85E+00	0.00E+00	1.21E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-03	0.00E+00
EE [17] [MJ. LHV]	0.00E+00	0.00E+00	9.42E-03	0.00E+00	3.11E-01	0.00E+00	0.00E+00	0.00E+00	4.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E+00	0.00E+00
TPE [18] [MJ. LHV]	1.31E+02	4.28E+00	3.78E+01	6.10E+00	2.45E+00	0.00E+00	1.74E+00	0.00E+00	3.70E+02	0.00E+00	0.00E+00	0.00E+00	1.03E+00	2.27E+00	-4.01E+01

[17] EE = Exported Energy
[18] TPE = Total Primary Energy

Table 32. Carbon Emissions and Removals over the ESL of 25 years

PARAMETER	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-0.299	-	-0.905	-	-0.0421	-	-	-	-	-
BCEK [kg CO2]	0.0224	-	0.27	-	0.876	-	-	-	-	-
BCEW [kg CO2]	-	-	-	-	-	-	-	-	-	-
CCE [kg CO2]	-	-	-	-	-	-	-	-	-	-
CCR [kg CO2]	-	-	-	-	-	-	-	-	-	-
CWNR [kg CO2]	-	-	-	-	-	-	-	-	-	-

BCRP: Biogenic Carbon Removal from Product / BCEP: Biogenic Carbon Emission from Product / BCRK: Biogenic Carbon Removal from Packaging / BCEK: Biogenic Carbon Emission from Packaging / BCEW: Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes / CCE: Calcination Carbon Emissions / CCR: Carbonation Carbon Removals / CWNR: Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes

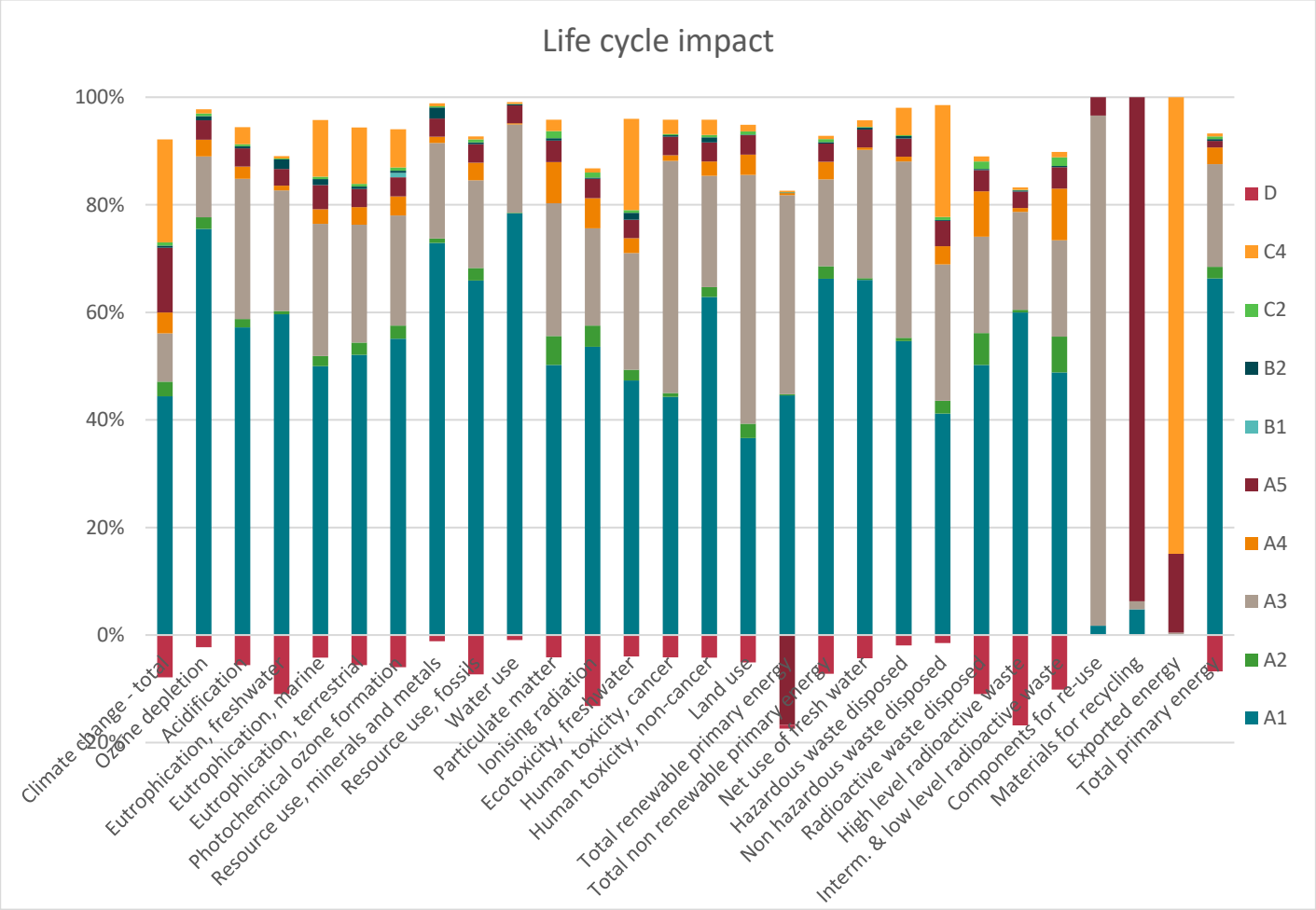
Table 33. Carbon Emissions and Removals over the ESL of 75 years

Parameter	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-0.299	-	-0.905	-	-0.0421	-	-	-2.4922	-	-
BCEK [kg CO2]	0.0224	-	0.27	-	0.876	-	-	2.3368	-	-
BCEW [kg CO2]	-	-	-	-	-	-	-	-	-	-
CCE [kg CO2]	-	-	-	-	-	-	-	-	-	-
CCR [kg CO2]	-	-	-	-	-	-	-	-	-	-
CWNR [kg CO2]	-	-	-	-	-	-	-	-	-	-

BCRP: Biogenic Carbon Removal from Product / BCEP: Biogenic Carbon Emission from Product / BCRK: Biogenic Carbon Removal from Packaging / BCEK: Biogenic Carbon Emission from Packaging / BCEW: Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes / CCE: Calcination Carbon Emissions / CCR: Carbonation Carbon Removals / CWNR: Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes

5. LCA Interpretation

Figure 2: Graph depicting selection of impact indicator results calculated according to EN 15804+A2 – (End of life 74% incineration / 26% landfill)



The primary contributor to the environemental impacts of the product is A1 – Extraction and transformation of the raw materials is impactant. Then comes A3 – Manufacturing because the impacts of the complementary installation products is allocated here.

6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

SPM Gerflor Group factory uses 100% certified renewable electricity in its plants.

On the production line, air quality measurements are carried out in accordance with standard NF X43-551 Qualité de l'air - Emissions de sources fixes - Exigences spécifiques de mesurage. Total VOC, bromine and phosgene flows comply with this standard.

Other measurements are carried out to monitor environmental and health impacts during manufacturing:

- River water analysis
- Noise analysis
- GPI audit (Granules Plastiques Industriels)
- Operators have access to safety data sheets for each product used.

The product is largely PVC, whose precursor is Vinyl chloride, listed under REACH's list of Substances of Very High Concern.

In addition:

- SPM products do not contain any substances subject to REACH restrictions.
- It's also important to remember that SPM products are made of rigid PVC and therefore do not contain plasticizers.
- In addition, the formulation of our panels contains no heavy metals, PBTs or BPA.
- We ask our suppliers to get ISO 14001 (environment) and ISO 50001 (energy) certification. It's important for their selection.

6.2. Environment and Health During Installation

The manufacturer's guidelines should be adhered to during the installation of this product.

SPM-Gerflor is part of the recycling program called PVC Next. As part of this program, bonded deposits and laying falls can be collected, and then recycled in other sectors. More information: secondevie@gerflor.com

SPM recommends the use of its own acrylic glue in aqueous phase for the fixation of its products: it is free of solvents and it is labeled EC1 and A+. The use of this glue involves wearing personal protective equipment: gloves and glasses. Wearing a mask is not necessary by ensuring good ventilation during use and drying of the product.

6.3. Environment and Health During the use stage

COV and formaldehyd emissions have been tested according to standard ISO 16000. The product is certified A+ according to the french regulation.

The measured concentration of total volatile organic compounds (TVOC) after 28 days is less than 1000 µg/m^3.

No formaldehyd has been introduced in the formula. The measured quantity is less than 10 µg/m^3.

The product is not exposed to soil and water during the use stage.

6.4. Extraordinary Effects

Fire

Fire behaviour have been tested according to EN 13501-1.
There's no test available for possible environnemental impacts during fire.

Water
There's no test available for possible impacts following unforseecable influence of water.

Mechanical Destruction
Mechanical damage does not chemically alter the product.

6.5. Delayed Emissions

No delayed emissions are taken into account.

6.6. Environmental Activities and Certifications

Indoor Air Quality Certified A+ according to ISO 16000

Test report N° G09750B from Eurofins
See details of the certification on the link : https://www.ecologie.gouv.fr/etiquetage-des-produits-construction

Gold Standard for Chemical Emissions for Building Materials. Finishes and Furnishings

Certificate Number 68449-420
See details of the certification on the link : https://www.ul.com/services/ul-greenguard-certification

6.7. Further Information

Additional information can be found in Panneau de protection PVC - Protection murale - SPM Supporting Documentation.

All documentation necessary to confirm the data provided in this EPD has been submitted to the critical reviewer.

7. References

ISO 14025
ISO 14025:2006 : Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012-04+A2 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

UL Environment
UL Environment General Program Instructions March 2022. version 2.7

UL Standard 10010. PCR Part A
PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0. March 2022. UL Environnment.
https://industries.ul.com/environment

UL 10010-7. PCR Part B
PCR - Part B: Wall and Door Protection EPD Requirements. First Edition. Dated May 22. 2019. UL Environnment. https://www.ul.com/

Ecoinvent V3.8
ecoinvent Life Cycle Inventory database Version 3.8
http://www.ecoinvent.org

8. Contact information

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