EPD RIGID ACOUSTIC

Ref. 4790579418.103.1 – May 2023

Introductory note from manufacturer

Please find attached the UL Environment third-party **certified EPD for Gerflor Rigid Acoustic range**.
This EPD covers 2 references : **Creation 40 Rigid Acoustic, R55 Lock Acoustic**.
Here is a quick guide to help you find the relevant EPD results :

Geographical zone	Nb of years considered in LCA	Results page
Europe	**75 years** (building service life)	>> EPD Table 19 (page 17)
	25 years (product service life)	>> EPD Table 22 (page 21)
Norway	**75 years** (building service life)	>> EPD Table 25 (page 26)
	25 years (product service life)	>> EPD Table 28 (page 30)

Here is a summary, for your convenience, of the **GWP results for Europe, including the 4 different end-of-life scenarios described in EPD, and a 1-year and 25-year scenario :**

			LIFE CYCLE IMPACT ASSESSMENT RESULTS (kg CO2 eq)													
			Production stage				Construction stage			Use stage			End of life stage			
EUROPE GWP (kg CO2 eq. /m2)		TOTAL LIFE CYCLE	A1 Raw materials supply	A2 Transport	A3 Manufacturing	TOTAL PRODUCTION	A4 Transport from gate to site	A5 Installation	TOTAL CONSTRUCTION	B2 Maintenance	B4 Replacement	TOTAL USE	C2 Transport	C3 Waste processing	C4 Disposal	TOTAL END OF LIFE
1 year	Recycling	16,92	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	0,280	-	**0,28**	0,184	0,057	-	**0,24**
	Landfill	17,44	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	0,280	-	**0,28**	0,184	-	0,571	**0,76**
	Incineration	33,06	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	0,280	-	**0,28**	0,184	-	16,200	**16,38**
	74% landfill 26% incineration*	21,49	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	0,280	-	**0,28**	0,184	-	4,630	**4,81**
25 years Table 22 (page 21)	Recycling	23,63	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	6,990	-	**6,99**	0,184	0,057	-	**0,24**
	Landfill	24,15	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	6,990	-	**6,99**	0,184	-	0,571	**0,76**
	Incineration	39,77	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	6,990	-	**6,99**	0,184	-	16,200	**16,38**
	74% landfill 26% incineration*	28,20	10,400	0,400	2,110	**12,91**	1,990	1,500	**3,49**	6,990	-	**6,99**	0,184	-	4,630	**4,81**

**Average scenario for Europe*

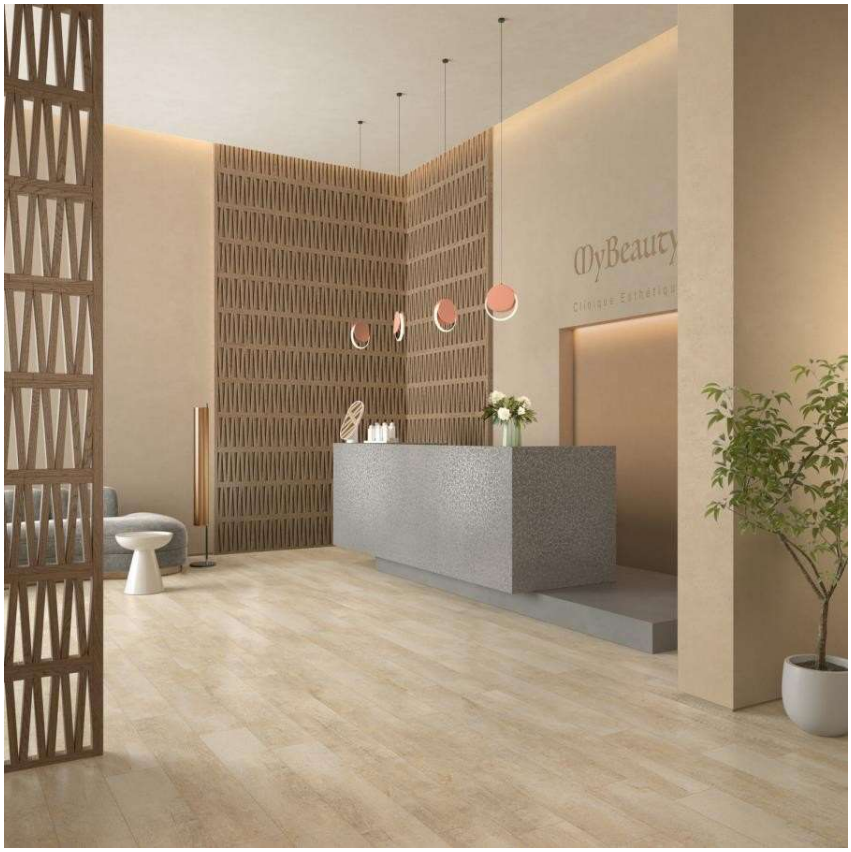
Note : Results are also **presented in the EPD for a building Estimated Service Life of 75 years** (table 19 page 17), as it is a requirement from UL certification body. The product life expectancy being 25 years, 2 product replacements will be necessary over 75 years. The impact of these replacements can be found in indicator B4 “Replacement”. B2 “Maintenance” is also proportional to the number of years considered.

Nathalie Faure
Sustainability Certification Manager
August 1, 2023

ENVIRONMENTAL PRODUCT DECLARATION

RIGID ACOUSTIC

VINYL FLOORING



Rigid Acoustic vinyl flooring collection

Because we think actions speak louder than words, Gerflor has always been willing to act and to develop flooring solutions that meet the most challenging requirements in term of design, durability, easy installation, acoustic comfort, ...
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.

Rigid Acoustic collection:

- The products emission rate of volatile organic compounds is < 10 µg/m^3 (TVOC after 28 days – ISO 16000 -6).
  Rigid Acoustic has an exclusive and patented ProtecShield™ surface treatment with improved stain and scratch resistance.
- They have the M1 certification.

Rigid Acoustic 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.

ENVIRONMENTAL PRODUCT DECLARATION

Gerflor
theflooringgroup

Rigid Acoustic
Vinyl Flooring

CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

According to ISO 14025, and EN 15804

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road, Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.4 July 2018	
MANUFACTURER NAME AND ADDRESS	GERFLOR 50 Cours de la République, 69100 Villeurbanne, France	
DECLARATION NUMBER	4790579418.103.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Rigid Acoustic The functional unit used for this study is 1m² of heterogeneous vinyl flooring, for a 25 years service life, and for a building estimated service life of 75 years.	
REFERENCE PCR AND VERSION NUMBER	PCR -Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 4.0, UL Environnment. PCR - Part B: Flooring EPD Requirements, Second Edition, Dated September 28, 2018, UL Environnment.	
DESCRIPTION OF PRODUCT APPLICATION/USE	The product is classified in accordance with EN ISO 10874 and in reference to the FCSS (Floor Covering Standard Symbols) to be installed in various areas of application including commercial and industrial applications.	
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 flooring manufacture and supply. The ESL is 75 years, so two replacements are required.	
MARKETS OF APPLICABILITY	European and Norwegian Commercial market	
DATE OF ISSUE	May 1, 2023	
PERIOD OF VALIDITY	5 years	
EPD TYPE	Product-specific	
RANGE OF DATASET VARIABILITY	Two products are considered in this EPD.	
EPD SCOPE	Cradle to Grave	
YEAR(S) OF REPORTED PRIMARY DATA	2021	
LCA SOFTWARE & VERSION NUMBER	Simapro 9	
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent 3.8 – allocution cut-off by classification	
LCIA METHODOLOGY & VERSION NUMBER	Method EN 15804 A2 EPD Ev-DEC 1.11 (EVEA)	

The PCR review was conducted by:	UL Environment PCR Review Panel epd@ul.com
This declaration was independently verified in accordance with ISO 14025: 2006. ☐ INTERNAL ☒EXTERNAL	Cooper McCollum Cooper McCollum, UL Environment
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

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 Gerflor. They are made in Gerflor's factory in Belgium before being stored in a Gerflor's warehouse.

1.2. Product Description

Product Identification

Product Designation: "Rigid Acoustic"

This environmental product declaration covers Gerflor Creation 40 Rigid Acoustic and R55 Lock Acoustic. The products are compact heterogeneous PVC floor coverings made by extrusion in several layers on a rigid backing for the building market. They are presented in the form of clip-on tiles and strips that incorporates a horizontal on both sides to facilitate installation. They are made of a wear layer, a high-definition printed decorative film to offer maximum variety in the design and the "Rigid Composite Board" technology: which consists of a rigid layer for renovation and a patented manufacturing process providing a 30% weight reduction. The products also contain an integrated acoustic underlayment providing 19dB of insulation. It benefits from a cross-linked polyurethane surface treatment (Protecshield™) facilitating maintenance and avoiding micro-scratches.

The following figures show Rigid Acoustic flooring collection:

Figure 1: Creation 40 Rigid Acoustic

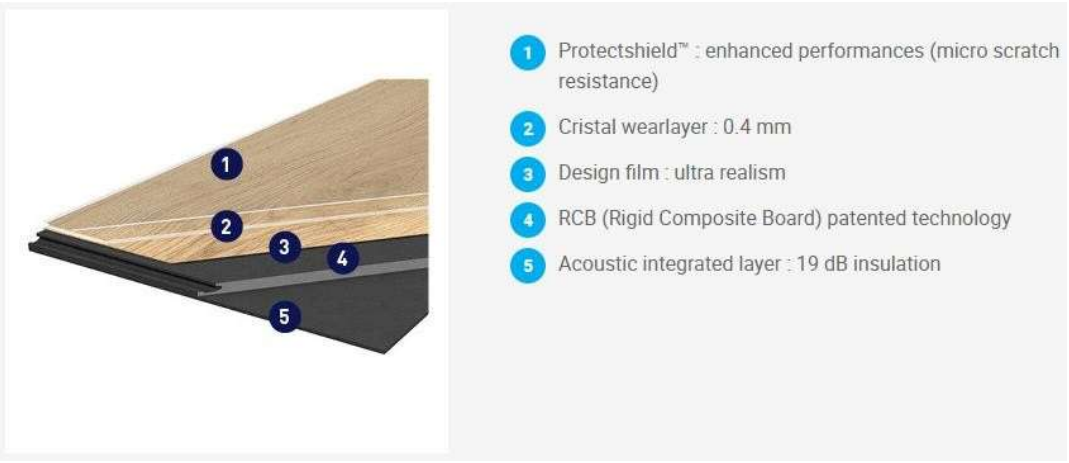
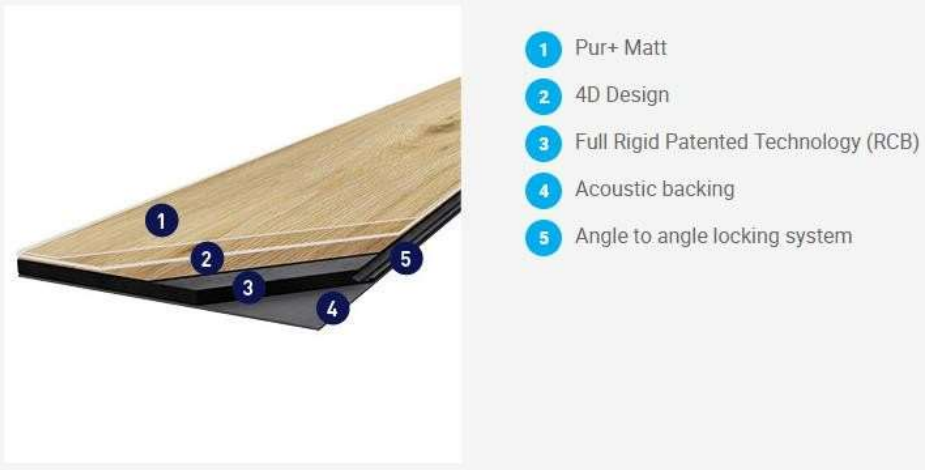


Figure 2: R55 Lock Acoustic



Product Specification

The products considered in this EPD meet or exceed one of the following Technical Specifications:

NF EN ISO 10582: Heterogeneous polyvinyl chloride floor coverings - Specifications
Cahier 3782_v2 of the CSTB of June 2018: " Notice on the UPEC classification and UPEC classification of premises ".
NF EN ISO 10874: resilient, textile and laminate floor coverings: classification

Specification Fire Testing:
Class 1 when tested in accordance with ASTM E 648, Standard Test Method for Critical Radiant Flux
Class 1 when tested in accordance with ASTM E 662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

The product is classified according to the United Nations Standard Products and Service Code (UNSPSC) as « Vinyl Flooring »: UNSPSC Code 30161707. And according to Construction Specification Institute (CSI) as « Resilient flooring »: CSI Code 09 65 00.

Product Specific EPD

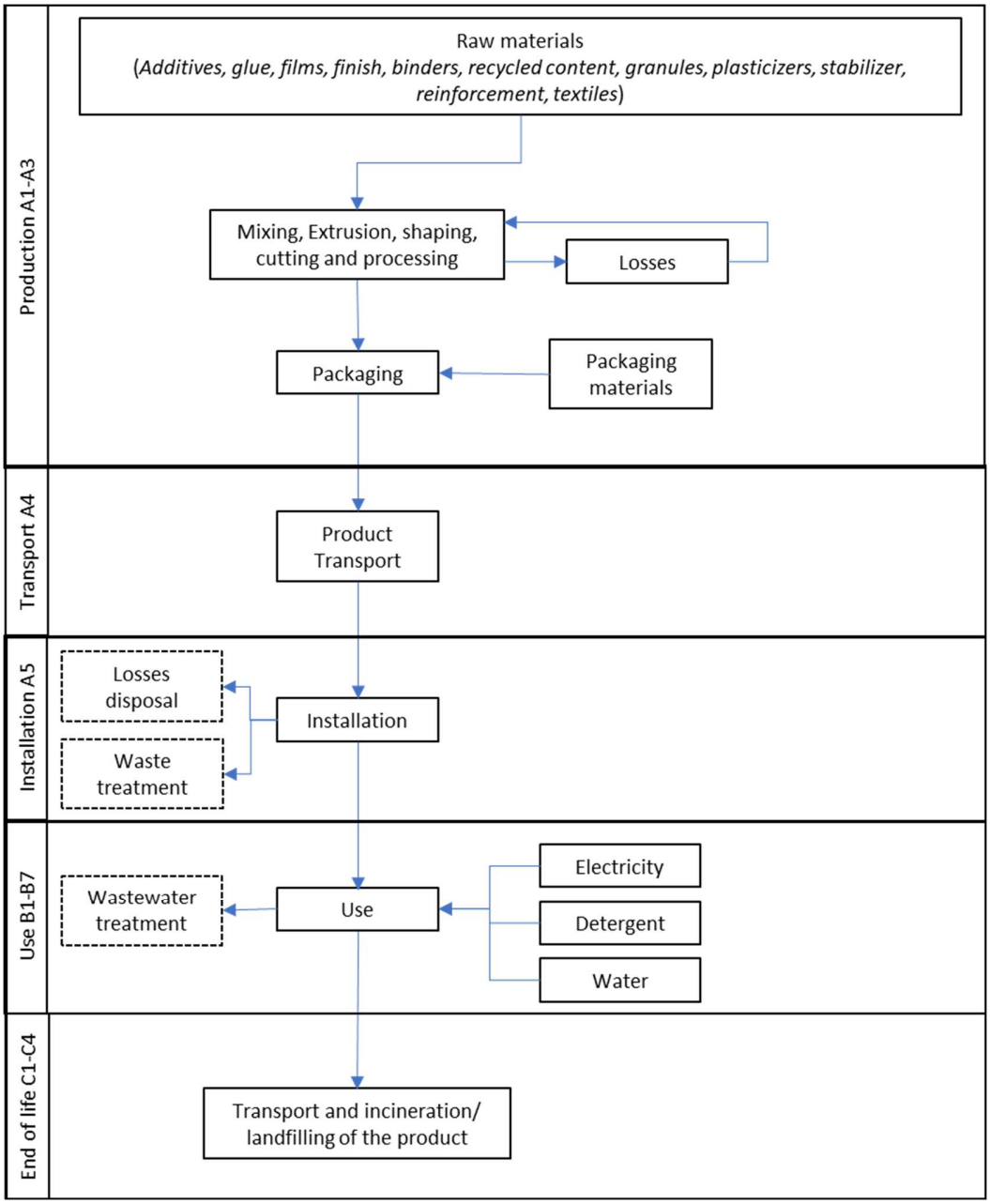
Two products are grouped and reported in this EPD as weight average product. The following products are covered :

1. Creation 40 Rigid Acoustic
2. R55 Lock Acoustic

Environnemental impacts of each have been compared and products have been considered as homogeneous, with a weighted coefficient of variation less or equal to 20% for each impact category.

Flow Diagram

Figure 3: Flow product diagram



1.3. Application

Creation 40 Rigid Acoustic and R55 Lock Acoustic are intended for interior floors, for installation in premises classified 23/33/42 according to the NF EN ISO 10874 standard.

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. It should be noted, however, that the service life of a heterogeneous LVT flooring may vary depending on the amount and nature of floor traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. This RSL is applicable as long as the product use complies with that defined by CE:EN 14041 in accordance with the product's classification.

1.5. Technical Requirements

Table 1: technical data of the declared product*

Name	Value	Unit
Product Thickness	5.70	mm
Product Weight	7.00	kg/m²
Density	1228	kg/m³

*The declared product is the average product of the Creation 40 Rigid Acoustic and the R55 Lock Acoustic.

1.6. Properties of Declared Product as Delivered

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

- M1 certification
- EN 13501-1 Fire Behavior – Classe Bfl-s1
- EN 16165 appendix B (DIN 51130) Slip Resistance R10

1.7. Material Composition

Table 2: Material content

Components	Mass %
Varnish	< 1%
Wear layer	10-15%
Printed film PVC	< 5%
Rigid layer	70-75%
Granules	< 5%
Adhesive	< 1%
Acoustic underlayer	< 5%
Packaging	<10%

1.8. Manufacturing

The production the tiles and strips are divided into the following stages:

- Mixing: Additives, fillers, binders, recycled content, stabilizer, granules, and pigments are mixed to obtain mixture,
- Extrusion: the different layers are assembled by extrusion,
- Finish,
- Surface treatment: The surface treatment is then applied to get the best durability possible,
- Shaping: Tiles and strips are cut at the desired dimensions.

1.9. Packaging

Each product is protected by 100% recycled corrugated cardboard. The whole being protected by a plastic film resting on a wooden pallet. Agglomerate protection plates are positioned on top of the pallets.

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

- 76.4% recycling, 16.4% landfilling and 7.2% incineration for carboard
- 24.8% recycling, 54.8% landfilling and 20.4% incineration for wood
- 37% recycling, 35% landfilling and 28% incineration for plastic

According to the Ecoinvent datas, the packaging waste scenario for Norway represents 92% against 8% of landfill.

1.10. Transportation

Rigid Acoustic collection is made in Belgium, stocked in a warehouse in France and is then sent to the European market. For Norway, Rigid Acoustic collection is made in Belgium, stocked in a warehouse in Germany then sent to the Norwegian market. Distances taken in account are described below.

Table 3: Transport from the factory to the customer

MEANS OF TRANSPORT	NORWEGIAN MARKET		EUROPEAN MARKET	
	Journey	Distance (km)	Journey	Distance (km)
Road – 16-32T Truck	From Gerflor factory to the warehouse	672	From Gerflor factory to the warehouse	947
	From the warehouse to the port	320	From the warehouse to the customer	1080
Boat	From Zeebruge port (Belgium) to Goteborg port (Sweden)	1007	From the warehouse to the customer	58
Road – 16-32T Truck	From the port to the warehouse (Norway)	255		
	From the warehouse to the customer	424		

1.11. Product Installation

The product is installed by hand without using acrylic glue, by clipping the product directly to the floor.

During the installation approximately 4% of the material is lost as off-cuts – this waste is mainly sent to landfill site.

1.12. Use

Current cleaning of the installed floor has been included in this study as following:

- Dry vaccum cleaning : 3 times a week
- Wet cleaning by hand with water and detergent: 2 times a week.

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. It should be noted however that the service life of Rigid Acoustic flooring may vary depending on the amount and nature of floor traffic and

the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. This RSL is applicable as long as the product use complies with ISO 14041 in accordance with the product's classification. 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 is a collection for recycling available on request for these products, but in general the end-of-life scenarios listed below are applied.

1.15. Disposal

For the purpose of this LCA, it has been assumed that 92% of the products are sent to incineration and 8% to landfill at the end of its useful life, according to the Ecoinvent datas and the producer's feedback for Norwegian market.

According to the PCR UL Part A, 50% of the product should be recycled for Europe. However, as no specific information was available for the flooring, it was assumed that 26% of the product would be incinerated and 74% landfilled.

The transport between construction site and incineration/landfill facility is by truck, with a distance of 161 km. There is no specific data for this distance for Norwegian and Europen market, so the North America's one, in PCR UL Part B, is assumed by default.

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.

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 4: Functional Unit

	Value	Unit
Functional Unit	1	m²
Mass	7.00	kg

2.2. System Boundary

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

A1 – A3: includes the provision of all raw materials and their 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 5: 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. 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 distance from building site to the end of life treatement center is considered with a distance of 161 km, according to PCR part B.

2.4. Cut-off Criteria

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.

2.5. 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

2.6. 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 (2021). 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 Gerflor supply chain has been used. If country specific data is unavailable, European regional data is used in preference to global data sources.

2.7. Period under Review

Data have been reviewed for the production year 2021.

2.8. Allocation

Allocations when using secondary materials as raw materials:

The recycled content comes from external sources (offcuts from installation and removal of old coatings), the end-of-waste status is considered at the level of the sorted material stock and no impact is assigned to the production of these offcuts.

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 flooring produced. All factory data is measured in square meters, and it is assumed that the process consumptions are governed by area of flooring processed rather than mass.

Allocation of multi-input processes if performed during modelling:

Production offcuts: the scraps are crushed and reintegrated into other products on other process lines. Since these scraps are not sold externally, a physical allocation is made between the main product and the scraps.

Thus, the overproduction to produce these losses is not considered in this case. The impacts of the production of these scraps are assigned to the system that uses them (other Gerflor products), so no impact is omitted.

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

2.9. Comparability (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/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

3. Life Cycle Assessment Scenarios

For European market:

Table 6. Transport to the building site for European market (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel, low sulfur	
Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 6	
Transport distance	1698	km
Capacity utilization (including empty runs, mass based	36	%
Gross density of products transported	1228	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	-
Boat		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.047	l/100km
Vehicle type	Transoceanic Ship	
Transport distance	58	km
Capacity utilization (including empty runs, mass based	100	%
Gross density of products transported	1228	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	-

For Norwegian market:

Table 7. Transport to the building site for Norwegian market (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel, low sulfur	

Liters of fuel	26	l/100km
Vehicle type	16-32 metric ton EURO 6	
Transport distance	1342	km
Capacity utilization (including empty runs, mass based	36	%
Gross density of products transported	1228	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	-
Boat		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.047	l/100km
Vehicle type	Transoceanic Ship	
Transport distance	1007	km
Capacity utilization (including empty runs, mass based	100	%
Gross density of products transported	1228	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	-

Table 8. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	-	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	-	m^3
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	2.80E-01	kg
Waste materials at the construction site before waste processing, generated by product installation	5.21E-01	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Biogenic carbon contained in packaging	7.83E-01	kg CO_2
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	-	kg/m²

Table 9. Reference Service Life

NAME	VALUE	UNIT
RSL	25	years

Declared product properties (at the gate) and finishes, etc.	Declared product properties are described in Declaration of Performance (DOP), in accordance with EN 14041	-
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Products in accordance with EN 14041 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	Assumed to be installed according to the manufacturer's instructions	-
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Use conditions in accordance with manufacturer prescriptions: see technical datasheet	-
Use conditions, e.g. frequency of use, mechanical exposure.	Maintenance scenario is defined in the table above	-
Maintenance, e.g. required frequency, type and quality of replacement components	Declared product properties are described in Declaration of Performance (DOP), in accordance with EN 14041	-

Table 10. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	Dry vacuum cleaning: 3/week Wet cleaning: 2/week	-
Maintenance cycle	6.50E+03	Number/ RSL
Maintenance cycle	1.95E+04	Number/ ESL
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	5.20E+00	L/year
Ancillary materials specified by type (e.g. cleaning agent)	5.20E-02	kg/year
Other resources	-	kg
Energy input, specified by activity, type and amount	3.90E-01	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 11. Repair (B3)

No data for given table

Table 12. Replacement (B4)

NAME	VALUE	UNIT
Reference Service Life	25	Years
Replacement cycle	2	(ESL-RSL)-1
Energy input, specified by activity, type and amount	-	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)	-	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 13. Refurbishment (B5)

No data for given table

Table 14. Operational energy use (B6) and Operational water use (B7)

No data for given table

Table 15. End of life for European market (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 sent to landfill. Waste transport is made by truck (16-32 metric ton Euro6). A 161km distance to the treatment center has been considered	
Collection process (specified by type)	Collected separately	7.00E+00	kg
	Collected with mixed construction waste	-	kg
Recovery for European market (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	5.18E+00	kg
	Incineration	1.82E+00	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

Table 16. End of life for Norwegian market (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 sent to landfill. Waste transport is made by truck (16-32 metric ton	

		Euro6). A 161km distance to the treatment center has been considered	
Collection process (specified by type)	Collected separately	7.00E+00	kg
	Collected with mixed construction waste	-	kg
Recovery for Norwegian market (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	5.60E-01	kg
	Incineration	6.44E+00	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

Table 17. Reuse, recovery and/or recycling potentials (D), relevant scenario information – European market

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)	1.26E+01	MJ
Net energy benefit from material flow declared in C3 for energy recovery	-	MJ
Process and conversion efficiencies		
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);		

Table 18. Reuse, recovery and/or recycling potentials (D), relevant scenario information – Norwegian market

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)	4.47E+01	MJ
Net energy benefit from material flow declared in C3 for energy recovery	-	MJ
Process and conversion efficiencies		
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 an ESL of 75 years which includes 2 replacements based on an RSL of 25 years. To estimate the impacts of a single product without replacement, divide the results of modules B2 and D by three and delete the results of B4.

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

For Europe and Norway, the selected scenarios include incineration and landfill. However, results for 100% landfill, 100% incineration and 100% recycling end-of-life scenarios will be presented.

4.1. European Results

For this EPD, the European scenario retained is 74% landfill and 26% incineration.

In the tables below, the results for A1 to C4, the total life cycle and module D are calculated according to this scenario.

The results for 100% incineration, 100% landfill only vary for C4 and have been added to the table. For 100% recycling, C3 vary and C4 is null, unlike the other scenarios.

4.1.1. European results for 75 years

Table 19. Environmental impacts over the ESL of 75 years – Europe

CML v4.3	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 74% Landfill & 26% incineration	C4 – 100% Landfill*	C4 – 100% Incineration*	Total life cycle (A1-C4)	D
GWP-total [kg CO2 eq.]	1.04E+01	4.00E-01	2.11E+00	1.99E+00	1.50E+00	2.10E+01	4.23E+01	1.84E-01	5.73E-02	4.63E+00	5.71E-01	1.62E+01	8.45E+01	-3.52E+00
GWP - fossil [kg CO2 eq.]	1.00E+01	3.99E-01	2.14E+00	1.99E+00	6.34E-01	1.95E+01	4.00E+01	1.84E-01	5.69E-02	4.62E+00	5.72E-01	1.62E+01	7.95E+01	-3.51E+00
GWP - biogenic [kg CO2 eq.]	3.52E-02	1.37E-04	-3.50E-02	8.07E-04	8.50E-01	1.42E-01	1.71E+00	7.45E-05	3.53E-04	3.88E-03	9.93E-05	1.46E-02	2.71E+00	-9.09E-03
GWP -luluc [kg de CO2 eq.]	2.93E-01	2.15E-04	5.14E-03	7.97E-04	1.20E-02	1.34E+00	6.27E-01	7.34E-05	1.30E-04	2.00E-03	1.47E-05	7.66E-03	2.28E+00	-3.73E-03
ODP [kg CFC 11 eq]	5.72E-06	8.69E-08	2.74E-07	4.61E-07	2.68E-07	1.61E-06	1.51E-05	4.25E-08	2.86E-09	6.93E-07	2.17E-08	2.60E-06	2.42E-05	-4.60E-07
AP [mole H+ eq]	4.46E-02	6.10E-03	5.52E-03	5.77E-03	2.61E-03	1.49E-01	1.45E-01	5.21E-04	3.03E-04	7.49E-03	5.19E-04	2.73E-02	3.67E-01	-1.77E-02
EP- freshwater [kg PO4 eq]	4.08E-04	2.25E-06	5.01E-05	1.42E-05	1.94E-05	2.28E-03	1.11E-03	1.31E-06	5.89E-06	5.93E-05	5.03E-07	2.26E-04	3.94E-03	-1.52E-04
EP- marine [kg N eq]	9.12E-03	1.47E-03	1.73E-03	1.15E-03	6.36E-04	6.36E-02	3.19E-02	1.04E-04	4.12E-05	1.73E-03	3.34E-04	5.69E-03	1.11E-01	-1.97E-03
EP- terrestrial [mole N eq]	8.06E-02	1.63E-02	1.54E-02	1.28E-02	5.45E-03	3.35E-01	2.99E-01	1.15E-03	4.71E-04	1.79E-02	2.10E-03	6.28E-02	7.84E-01	-2.21E-02
POCP [kg COVNM eq]	3.07E-02	4.42E-03	4.59E-03	4.89E-03	1.95E-03	6.82E-02	1.04E-01	4.44E-04	1.33E-04	4.94E-03	7.20E-04	1.69E-02	2.24E-01	-6.86E-03
ADP-e [kg Sb eq]	1.66E-04	1.06E-06	9.45E-06	7.08E-06	7.43E-06	2.46E-04	4.14E-04	6.54E-07	1.58E-07	1.59E-05	2.02E-07	6.07E-05	8.67E-04	-3.85E-06
ADP-f [MJ, LHV]	2.48E+02	5.66E+00	5.93E+01	3.02E+01	1.42E+01	4.15E+02	7.51E+02	2.78E+00	1.21E+00	1.60E+01	1.57E+00	5.72E+01	1.54E+03	-6.12E+01
WDP [m3 of deprivation eq in the world]	1.42E+01	1.44E-02	5.94E-01	9.17E-02	5.97E-01	2.58E+01	3.32E+01	8.47E-03	1.38E-02	1.13E+00	7.51E-03	4.31E+00	7.56E+01	-3.32E-01
Particulate matter [Incidence of disease]	3.80E-07	2.38E-08	7.11E-08	1.60E-07	2.81E-08	1.02E-06	1.49E-06	1.47E-08	9.88E-10	6.59E-08	1.13E-08	2.21E-07	3.25E-06	-9.93E-08

Ionising radiation [kBq235U éq]	4.98E-01	2.44E-02	5.13E-01	1.31E-01	4.89E-02	2.44E+00	2.60E+00	1.21E-02	1.05E-02	7.01E-02	7.19E-03	2.49E-01	6.33E+00	-3.33E-01
Ecotoxicity, freshwater [CTUe]	2.09E+02	4.07E+00	2.80E+01	2.37E+01	1.21E+01	8.20E+02	1.17E+03	2.18E+00	6.73E-01	3.04E+02	2.66E+01	1.09E+03	2.57E+03	-2.39E+01
Human toxicity, cancer [CTUh]	7.29E-09	1.90E-10	2.26E-09	7.62E-10	4.58E-10	3.60E-08	2.53E-08	7.02E-11	3.19E-11	1.60E-09	4.89E-11	6.00E-09	7.39E-08	-8.62E-10
Human toxicity, non-cancer [CTUh]	1.95E-07	3.64E-09	1.87E-08	2.39E-08	1.03E-08	5.33E-07	6.54E-07	2.21E-09	5.78E-10	7.34E-08	4.94E-09	2.68E-07	1.51E-06	-1.99E-08
Land use [No dimension]	4.50E+01	2.74E+00	6.09E+01	2.10E+01	5.70E+00	5.39E+02	2.89E+02	1.94E+00	1.83E-01	7.32E+00	4.08E+00	1.66E+01	9.72E+02	-1.37E+01

Table 20. Resources, waste categories and outgoing flows over the ESL of 75 years – Europe

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 74% Landfill & 26% incineration	C4 – 100% Landfill*	C4 – 100% Incineration*	Total life cycle (A1-C4)	D
RPRE [MJ, LHV]	1.74E+01	6.47E-02	7.17E+00	4.31E-01	5.58E+00	1.92E+02	6.49E+01	3.98E-02	2.08E-01	1.77E+00	6.81E-02	6.63E+00	2.89E+02	-8.69E+00
RPRM [MJ, LHV]	-	-	6.57E+00	-	-4.30E+00	-	4.55E+00	-	-	-	-	-	6.82E+00	-
RPRT [MJ, LHV]	1.74E+01	6.47E-02	1.37E+01	4.31E-01	1.28E+00	1.92E+02	6.95E+01	3.98E-02	2.08E-01	1.77E+00	6.81E-02	6.63E+00	2.96E+02	-8.69E+00
NRPRE [MJ, LHV]	1.45E+02	5.66E+00	5.93E+01	3.02E+01	1.02E+01	3.11E+02	6.12E+02	2.78E+00	1.18E+00	5.24E+01	1.57E+00	1.97E+02	1.23E+03	-6.06E+01
NRPRM [MJ, LHV]	1.45E+02	-	-1.01E-02	-	5.72E+00	1.04E+02	2.29E+02	-	-	-3.64E+01	-	-1.40E+02	4.47E+02	-
NRPRT [MJ, LHV]	2.91E+02	5.66E+00	5.93E+01	3.02E+01	1.59E+01	4.15E+02	8.41E+02	2.78E+00	1.18E+00	1.60E+01	1.57E+00	5.71E+01	1.68E+03	-6.06E+01
SM [kg]	-	-	1.79E-01	-	7.17E-03	-	3.73E-01	-	-	-	-	-	5.60E-01	-
RSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FW [m3]	1.98E-01	5.02E-04	2.05E-02	3.35E-03	9.15E-03	1.28E+00	5.27E-01	3.09E-04	1.01E-03	3.16E-02	1.98E-03	1.16E-01	2.07E+00	-2.51E-02
RE [MJ]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HWD [kg]	3.92E-01	4.67E-03	4.07E-02	2.21E-02	1.96E-02	1.05E+00	1.43E+00	2.04E-03	1.87E-03	2.31E-01	1.81E-03	8.84E-01	3.19E+00	-3.39E-02

NHWD [kg]	3.93E+00	2.19E-01	1.58E+00	1.75E+00	8.16E-01	9.82E+00	2.91E+01	1.62E-01	1.96E-02	6.11E+00	7.01E+00	3.54E+00	5.35E+01	-4.17E-01
HLRW [kg]	7.46E-05	3.14E-07	9.52E-05	2.24E-06	6.99E-06	4.05E-04	3.78E-04	2.07E-07	1.80E-06	9.54E-06	1.80E-07	3.62E-05	9.72E-04	-4.57E-05
ILLRW [kg]	3.86E-04	3.83E-05	4.03E-04	2.02E-04	4.43E-05	1.68E-03	2.30E-03	1.86E-05	6.80E-06	5.68E-05	9.93E-06	1.90E-04	5.13E-03	-2.86E-04
CRU [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MFR [kg]	-	-	1.16E-01	-	2.29E-01	-	6.88E-01	-	-	-	-	-	1.03E+00	-
MER [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE [MJ, LHV]	-	-	5.35E-01	-	3.67E-01	-	2.71E+01	-	-	1.26E+01	-	4.86E+01	4.06E+01	-

*These scenarios are fictitious, they do not reflect the end of life considered in this study.

Table 21. Carbon Emissions and Removals over the ESL of 75 years

PARAMETER	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4	TOTAL LIFE CYCLE (A1-C4)
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-	-	7.83E-01	-	-	-	-	1.49E+00	-	-	2.24E+00
BCEK [kg CO2]	-	-	-	-	7.83E-01	-	-	1.49E+00	-	-	2.24E+00
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

4.1.2. European results for 25 years

Table 22. Environmental impacts over the ESL of 25 years – Europe

CML v4.3	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 74% Landfill & 26% incineration	C4 – 100% Landfill*	C4 – 100% Incineration*	Total life cycle (A1-C4)	D
GWP-total [kg CO2 eq.]	1.04E+01	4.00E-01	2.11E+00	1.99E+00	1.50E+00	6.99E+00	-	1.84E-01	5.73E-02	4.63E+00	5.71E-01	1.62E+01	2.82E+01	-1.17E+00
GWP - fossil [kg CO2 eq.]	1.00E+01	3.99E-01	2.14E+00	1.99E+00	6.34E-01	6.49E+00	-	1.84E-01	5.69E-02	4.62E+00	5.72E-01	1.62E+01	2.63E+01	-1.17E+00
GWP - biogenic [kg CO2 eq.]	3.52E-02	1.37E-04	-3.50E-02	8.07E-04	8.50E-01	4.72E-02	-	7.45E-05	3.53E-04	3.88E-03	9.93E-05	1.46E-02	9.02E-01	-3.03E-03
GWP -luluc [kg de CO2 eq.]	2.93E-01	2.15E-04	5.14E-03	7.97E-04	1.20E-02	4.46E-01	-	7.34E-05	1.30E-04	2.00E-03	1.47E-05	7.66E-03	7.60E-01	-1.24E-03
ODP [kg CFC 11 eq]	5.72E-06	8.69E-08	2.74E-07	4.61E-07	2.68E-07	5.35E-07	-	4.25E-08	2.86E-09	6.93E-07	2.17E-08	2.60E-06	8.04E-06	-1.53E-07
AP [mole H+ eq]	4.46E-02	6.10E-03	5.52E-03	5.77E-03	2.61E-03	4.97E-02	-	5.21E-04	3.03E-04	7.49E-03	5.19E-04	2.73E-02	1.22E-01	-5.91E-03
EP- freshwater [kg PO4 eq]	4.08E-04	2.25E-06	5.01E-05	1.42E-05	1.94E-05	7.58E-04	-	1.31E-06	5.89E-06	5.93E-05	5.03E-07	2.26E-04	1.31E-03	-5.07E-05
EP- marine [kg N eq]	9.12E-03	1.47E-03	1.73E-03	1.15E-03	6.36E-04	2.12E-02	-	1.04E-04	4.12E-05	1.73E-03	3.34E-04	5.69E-03	3.70E-02	-6.55E-04
EP- terrestrial [mole N eq]	8.06E-02	1.63E-02	1.54E-02	1.28E-02	5.45E-03	1.12E-01	-	1.15E-03	4.71E-04	1.79E-02	2.10E-03	6.28E-02	2.60E-01	-7.35E-03
POCP [kg COVNM eq]	3.07E-02	4.42E-03	4.59E-03	4.89E-03	1.95E-03	2.27E-02	-	4.44E-04	1.33E-04	4.94E-03	7.20E-04	1.69E-02	7.43E-02	-2.29E-03
ADP-e [kg Sb eq]	1.66E-04	1.06E-06	9.45E-06	7.08E-06	7.43E-06	8.20E-05	-	6.54E-07	1.58E-07	1.59E-05	2.02E-07	6.07E-05	2.88E-04	-1.28E-06
ADP-f [MJ, LHV]	2.48E+02	5.66E+00	5.93E+01	3.02E+01	1.42E+01	1.38E+02	-	2.78E+00	1.21E+00	1.60E+01	1.57E+00	5.72E+01	5.11E+02	-2.04E+01
WDP [m3 of deprivation eq in the world]	1.42E+01	1.44E-02	5.94E-01	9.17E-02	5.97E-01	8.60E+00	-	8.47E-03	1.38E-02	1.13E+00	7.51E-03	4.31E+00	2.52E+01	-1.11E-01
Particulate matter	3.80E-07	2.38E-08	7.11E-08	1.60E-07	2.81E-08	3.38E-07	-	1.47E-08	9.88E-10	6.59E-08	1.13E-08	2.21E-07	1.07E-06	-3.31E-08

[Incidence of disease]														
Ionising radiation [kBq235U éq]	4.98E-01	2.44E-02	5.13E-01	1.31E-01	4.89E-02	8.12E-01	-	1.21E-02	1.05E-02	7.01E-02	7.19E-03	2.49E-01	2.10E+00	-1.11E-01
Ecotoxicity, freshwater [CTUe]	2.09E+02	4.07E+00	2.80E+01	2.37E+01	1.21E+01	2.73E+02	-	2.18E+00	6.73E-01	3.04E+02	2.66E+01	1.09E+03	8.55E+02	-7.97E+00
Human toxicity, cancer [CTUh]	7.29E-09	1.90E-10	2.26E-09	7.62E-10	4.58E-10	1.20E-08	-	7.02E-11	3.19E-11	1.60E-09	4.89E-11	6.00E-09	2.45E-08	-2.87E-10
Human toxicity, non-cancer [CTUh]	1.95E-07	3.64E-09	1.87E-08	2.39E-08	1.03E-08	1.78E-07	-	2.21E-09	5.78E-10	7.34E-08	4.94E-09	2.68E-07	5.02E-07	-6.63E-09
Land use [No dimension]	4.50E+01	2.74E+00	6.09E+01	2.10E+01	5.70E+00	1.80E+02	-	1.94E+00	1.83E-01	7.32E+00	4.08E+00	1.66E+01	3.22E+02	-4.56E+00

Table 23. Resources, waste categories and outgoing flows over the ESL of 25 years – Europe

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 74% Landfill & 26% incineration	C4 – 100% Landfill*	C4 – 100% Incineration*	Total life cycle (A1-C4)	D
RPRE [MJ, LHV]	1.74E+01	6.47E-02	7.17E+00	4.31E-01	5.58E+00	6.38E+01	-	3.98E-02	2.08E-01	1.77E+00	6.81E-02	6.63E+00	9.63E+01	-2.90E+00
RPRM [MJ, LHV]	-	-	6.57E+00	-	-4.30E+00	-	-	-	-	-	-	-	2.27E+00	-
RPRT [MJ, LHV]	1.74E+01	6.47E-02	1.37E+01	4.31E-01	1.28E+00	6.38E+01	-	3.98E-02	2.08E-01	1.77E+00	6.81E-02	6.63E+00	9.86E+01	-2.90E+00
NRPRE [MJ, LHV]	1.45E+02	5.66E+00	5.93E+01	3.02E+01	1.02E+01	1.04E+02	-	2.78E+00	1.18E+00	5.24E+01	1.57E+00	1.97E+02	4.10E+02	-2.02E+01
NRPRM [MJ, LHV]	1.45E+02	-	-1.01E-02	-	5.72E+00	3.46E+01	-	-	-	-3.64E+01	-	-1.40E+02	1.49E+02	-
NRPRT [MJ, LHV]	2.91E+02	5.66E+00	5.93E+01	3.02E+01	1.59E+01	1.38E+02	-	2.78E+00	1.18E+00	1.60E+01	1.57E+00	5.71E+01	5.59E+02	-2.02E+01
SM [kg]	-	-	1.79E-01	-	7.17E-03	-	-	-	-	-	-	-	1.87E-01	-
RSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FW [m3]	1.98E-01	5.02E-04	2.05E-02	3.35E-03	9.15E-03	4.26E-01	-	3.09E-04	1.01E-03	3.16E-02	1.98E-03	1.16E-01	6.90E-01	-8.36E-03
RE [MJ]	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HWD [kg]	3.92E-01	4.67E-03	4.07E-02	2.21E-02	1.96E-02	3.50E-01	-	2.04E-03	1.87E-03	2.31E-01	1.81E-03	8.84E-01	1.06E+00	-1.13E-02
NHWD [kg]	3.93E+00	2.19E-01	1.58E+00	1.75E+00	8.16E-01	3.27E+00	-	1.62E-01	1.96E-02	6.11E+00	7.01E+00	3.54E+00	1.78E+01	-1.39E-01
HLRW [kg]	7.46E-05	3.14E-07	9.52E-05	2.24E-06	6.99E-06	1.35E-04	-	2.07E-07	1.80E-06	9.54E-06	1.80E-07	3.62E-05	3.24E-04	-1.52E-05
ILLRW [kg]	3.86E-04	3.83E-05	4.03E-04	2.02E-04	4.43E-05	5.59E-04	-	1.86E-05	6.80E-06	5.68E-05	9.93E-06	1.90E-04	1.71E-03	-9.53E-05
CRU [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MFR [kg]	-	-	1.16E-01	-	2.29E-01	-	-	-	-	-	-	-	3.44E-01	-
MER [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE [MJ, LHV]	-	-	5.35E-01	-	3.67E-01	-	-	-	-	1.26E+01	-	4.86E+01	1.35E+01	-

*These scenarios are fictitious, they do not reflect the end of life considered in this study.

Table 24. Carbon Emissions and Removals over the ESL of 25 years

PARAMETER	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4	TOTAL LIFE CYCLE (A1-C4)
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-	-	7.83E-01	-	-	-	-	-	-	-	7.83E-01
BCEK [kg CO2]	-	-	-	-	7.83E-01	-	-	-	-	-	7.83E-01
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

4.2. Norwegian scenario

For this EPD, the Norwegian scenario retained is 8% landfill and 92% incineration.

In the tables below, the results for A1 to C4, the total life cycle and module D are calculated according to this scenario.

The results for 100% incineration, 100% landfill only vary for C4 and have been added to the table. For 100% recycling, C3 vary and C4 is null, unlike the other scenarios.

4.2.1. Norwegian results for 75 years

Table 25. Environmental impacts over the ESL of 75 years – Norway

CML v4.3	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 8% Landfill & 92% incineration	C4 – 100% Landfill*	C4 – 100% Incineration *	Total life cycle (A1-C4)	D
GWP-total [kg CO2 eq.]	1.04E+01	4.00E-01	2.11E+00	1.64E+00	1.45E+00	1.00E+01	6.21E+01	1.84E-01	6.10E-03	1.49E+01	5.71E-01	1.62E+01	1.03E+02	-2.23E+00
GWP - fossil [kg CO2 eq.]	1.00E+01	3.99E-01	2.14E+00	1.64E+00	6.27E-01	8.63E+00	5.99E+01	1.84E-01	5.99E-03	1.49E+01	5.72E-01	1.62E+01	9.84E+01	-2.23E+00
GWP - biogenic [kg CO2 eq.]	3.52E-02	1.37E-04	-3.50E-02	6.54E-04	8.08E-01	8.90E-02	1.64E+00	7.45E-05	8.91E-05	1.35E-02	9.93E-05	1.46E-02	2.56E+00	-2.62E-03
GWP -luluc [kg de CO2 eq.]	2.93E-01	2.15E-04	5.14E-03	6.77E-04	1.20E-02	1.32E+00	6.37E-01	7.34E-05	2.10E-05	7.05E-03	1.47E-05	7.66E-03	2.27E+00	-9.71E-04
ODP [kg CFC 11 eq]	5.72E-06	8.69E-08	2.74E-07	3.77E-07	2.66E-07	1.05E-06	1.83E-05	4.25E-08	2.88E-10	2.40E-06	2.17E-08	2.60E-06	2.85E-05	-3.96E-07
AP [mole H+ eq]	4.46E-02	6.10E-03	5.52E-03	6.67E-03	2.77E-03	8.87E-02	1.83E-01	5.21E-04	2.45E-05	2.52E-02	5.19E-04	2.73E-02	3.63E-01	-1.07E-02
EP- freshwater [kg PO4 eq]	4.08E-04	2.25E-06	5.01E-05	1.14E-05	1.92E-05	1.08E-03	1.40E-03	1.31E-06	2.37E-07	2.08E-04	5.03E-07	2.26E-04	3.18E-03	-1.02E-05
EP- marine [kg N eq]	9.12E-03	1.47E-03	1.73E-03	1.43E-03	6.76E-04	5.59E-02	3.96E-02	1.04E-04	5.19E-06	5.26E-03	3.34E-04	5.69E-03	1.15E-01	-1.06E-03
EP- terrestrial [mole N eq]	8.06E-02	1.63E-02	1.54E-02	1.59E-02	6.22E-03	2.46E-01	3.87E-01	1.15E-03	5.84E-05	5.79E-02	2.10E-03	6.28E-02	8.27E-01	-1.17E-02
POCP [kg COVNM eq]	3.07E-02	4.42E-03	4.59E-03	5.36E-03	2.12E-03	4.38E-02	1.27E-01	4.44E-04	1.98E-05	1.56E-02	7.20E-04	1.69E-02	2.34E-01	-4.03E-03
ADP-e [kg Sb eq]	1.66E-04	1.06E-06	9.45E-06	5.69E-06	7.40E-06	2.26E-04	4.91E-04	6.54E-07	1.21E-07	5.59E-05	2.02E-07	6.07E-05	9.63E-04	-2.91E-06
ADP-f [MJ, LHV]	2.48E+02	5.66E+00	5.93E+01	2.47E+01	1.39E+01	1.77E+02	8.13E+02	2.78E+00	8.40E-02	5.28E+01	1.57E+00	5.72E+01	1.40E+03	-3.31E+01
WDP [m3 of deprivation eq in the world]	1.42E+01	1.44E-02	5.94E-01	7.39E-02	5.98E-01	2.37E+01	3.89E+01	8.47E-03	4.23E-03	3.97E+00	7.51E-03	4.31E+00	8.20E+01	-9.26E-02
Particulate matter [Incidence of disease]	3.80E-07	2.38E-08	7.11E-08	1.28E-07	2.76E-08	8.79E-07	1.70E-06	1.47E-08	3.87E-10	2.05E-07	1.13E-08	2.21E-07	3.43E-06	-8.42E-08

Ionising radiation [kBq235U éq]	4.98E-01	2.44E-02	5.13E-01	1.07E-01	4.76E-02	5.18E-01	2.86E+00	1.21E-02	1.25E-03	2.30E-01	7.19E-03	2.49E-01	4.81E+00	-1.06E-01
Ecotoxicity, freshwater [CTUe]	2.09E+02	4.07E+00	2.80E+01	1.92E+01	1.23E+01	7.03E+02	2.57E+03	2.18E+00	1.46E-01	1.01E+03	2.66E+01	1.09E+03	4.55E+03	-1.07E+01
Human toxicity, cancer [CTUh]	7.29E-09	1.90E-10	2.26E-09	6.42E-10	5.76E-10	3.36E-08	3.31E-08	7.02E-11	2.14E-11	5.53E-09	4.89E-11	6.00E-09	8.33E-08	-5.99E-10
Human toxicity, non-cancer [CTUh]	1.95E-07	3.64E-09	1.87E-08	1.92E-08	1.06E-08	4.34E-07	9.93E-07	2.21E-09	1.48E-10	2.47E-07	4.94E-09	2.68E-07	1.92E-06	-9.09E-09
Land use [No dimension]	4.50E+01	2.74E+00	6.09E+01	1.67E+01	5.44E+00	4.99E+02	2.96E+02	1.94E+00	3.28E-02	1.56E+01	4.08E+00	1.66E+01	9.44E+02	-9.93E+00

Table 26. Resources, waste categories and outgoing flows over the ESL of 75 years – Norway

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 8% Landfill & 92% incineration	C4 – 100% Landfill*	C4 – 100% Incineration *	Total life cycle (A1-C4)	D
RPRE [MJ, LHV]	1.74E+01	6.47E-02	7.17E+00	3.46E-01	7.95E+00	2.62E+02	7.82E+01	3.98E-02	5.44E-01	6.10E+00	6.81E-02	6.63E+00	3.79E+02	-1.71E+01
RPRM [MJ, LHV]	-	-	6.57E+00	-	-6.67E+00	-	-2.01E-01	-	-	-	-	-	-3.01E-01	-
RPRT [MJ, LHV]	1.74E+01	6.47E-02	1.37E+01	3.46E-01	1.28E+00	2.62E+02	7.80E+01	3.98E-02	5.44E-01	6.10E+00	6.81E-02	6.63E+00	3.79E+02	-1.71E+01
NRPRE [MJ, LHV]	1.45E+02	5.66E+00	5.93E+01	2.47E+01	9.98E+00	7.81E+01	8.59E+02	2.78E+00	8.25E-02	1.81E+02	1.57E+00	1.97E+02	1.37E+03	-3.31E+01
NRPRM [MJ, LHV]	1.45E+02	-	-1.01E-02	-	5.69E+00	1.04E+02	4.41E+01	-	-	-1.29E+02	-	-1.40E+02	1.70E+02	-
NRPRT [MJ, LHV]	2.91E+02	5.66E+00	5.93E+01	2.47E+01	1.57E+01	1.82E+02	9.03E+02	2.78E+00	8.25E-02	5.26E+01	1.57E+00	5.71E+01	1.54E+03	-3.31E+01
SM [kg]	-	-	1.79E-01	-	7.17E-03	-	3.73E-01	-	-	-	-	-	5.60E-01	-
RSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FW [m3]	1.98E-01	5.02E-04	2.05E-02	2.69E-03	9.28E-03	1.94E+00	6.77E-01	3.09E-04	4.00E-03	1.07E-01	1.98E-03	1.16E-01	2.96E+00	-9.91E-02
RE [MJ]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HWD [kg]	3.92E-01	4.67E-03	4.07E-02	1.83E-02	2.41E-02	8.22E-01	2.59E+00	2.04E-03	-	8.14E-01	1.81E-03	8.84E-01	4.71E+00	-9.00E-03

NHWD [kg]	3.93E+00	2.19E-01	1.58E+00	1.39E+00	6.29E-01	7.49E+00	2.34E+01	1.62E-01	8.78E-04	3.81E+00	7.01E+00	3.54E+00	4.26E+01	-1.59E-01
HLRW [kg]	7.46E-05	3.14E-07	9.52E-05	1.79E-06	6.93E-06	4.78E-05	4.25E-04	2.07E-07	9.35E-03	3.33E-05	1.80E-07	3.62E-05	6.85E-04	-3.50E-06
ILLRW [kg]	3.86E-04	3.83E-05	4.03E-04	1.65E-04	4.25E-05	3.63E-04	2.46E-03	1.86E-05	1.01E-07	1.76E-04	9.93E-06	1.90E-04	4.05E-03	-1.30E-04
CRU [kg]	-	-	-	-	-	-	-	-	5.37E-07	-	-	-	-	-
MFR [kg]	-	-	1.16E-01	-	4.63E-03	-	2.41E-01	-	-	-	-	-	3.61E-01	-
MER [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE [MJ, LHV]	-	-	5.35E-01	-	1.79E+00	-	9.40E+01	-	-	4.47E+01	-	4.86E+01	1.41E+02	-

*These scenarios are fictitious, they do not reflect the end of life considered in this study.

Table 27. Carbon Emissions and Removals over the ESL of 75 years – Norway

PARAMETER	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4	TOTAL LIFE CYCLE (A1-C4)
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-	-	7.83E-01	-	-	-	-	1.49E+00	-	-	2.24E+00
BCEK [kg CO2]	-	-	-	-	7.83E-01	-	-	1.49E+00	-	-	2.24E+00
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

4.2.2. Norwegian results for 25 years

Table 28. Environmental impacts over the ESL of 25 years – Norway

CML v4.3	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 8% Landfill & 92% incineration	C4 – 100% Landfill*	C4 – 100% Incineration *	Total life cycle (A1-C4)	D
GWP-total [kg CO2 eq.]	1.04E+01	4.00E-01	2.11E+00	1.64E+00	1.45E+00	3,35E+00	-	1.84E-01	6.10E-03	1.49E+01	5.71E-01	1.62E+01	3,44E+01	-7,44E-01
GWP - fossil [kg CO2 eq.]	1.00E+01	3.99E-01	2.14E+00	1.64E+00	6.27E-01	2,88E+00	-	1.84E-01	5.99E-03	1.49E+01	5.72E-01	1.62E+01	3,28E+01	-7,43E-01
GWP - biogenic [kg CO2 eq.]	3.52E-02	1.37E-04	-3.50E-02	6.54E-04	8.08E-01	2,97E-02	-	7.45E-05	8.91E-05	1.35E-02	9.93E-05	1.46E-02	8,52E-01	-8,74E-04
GWP -luluc [kg de CO2 eq.]	2.93E-01	2.15E-04	5.14E-03	6.77E-04	1.20E-02	4,39E-01	-	7.34E-05	2.10E-05	7.05E-03	1.47E-05	7.66E-03	7,57E-01	-3,24E-04
ODP [kg CFC 11 eq]	5.72E-06	8.69E-08	2.74E-07	3.77E-07	2.66E-07	3,51E-07	-	4.25E-08	2.88E-10	2.40E-06	2.17E-08	2.60E-06	9,51E-06	-1,32E-07
AP [mole H+ eq]	4.46E-02	6.10E-03	5.52E-03	6.67E-03	2.77E-03	2,96E-02	-	5.21E-04	2.45E-05	2.52E-02	5.19E-04	2.73E-02	1,21E-01	-3,58E-03
EP- freshwater [kg PO4 eq]	4.08E-04	2.25E-06	5.01E-05	1.14E-05	1.92E-05	3,59E-04	-	1.31E-06	2.37E-07	2.08E-04	5.03E-07	2.26E-04	1,06E-03	-3,39E-06
EP- marine [kg N eq]	9.12E-03	1.47E-03	1.73E-03	1.43E-03	6.76E-04	1,86E-02	-	1.04E-04	5.19E-06	5.26E-03	3.34E-04	5.69E-03	3,84E-02	-3,54E-04
EP- terrestrial [mole N eq]	8.06E-02	1.63E-02	1.54E-02	1.59E-02	6.22E-03	8,21E-02	-	1.15E-03	5.84E-05	5.79E-02	2.10E-03	6.28E-02	2,76E-01	-3,90E-03
POCP [kg COVNM eq]	3.07E-02	4.42E-03	4.59E-03	5.36E-03	2.12E-03	1,46E-02	-	4.44E-04	1.98E-05	1.56E-02	7.20E-04	1.69E-02	7,79E-02	-1,34E-03
ADP-e [kg Sb eq]	1.66E-04	1.06E-06	9.45E-06	5.69E-06	7.40E-06	7,53E-05	-	6.54E-07	1.21E-07	5.59E-05	2.02E-07	6.07E-05	3,21E-04	-9,70E-07
ADP-f [MJ, LHV]	2.48E+02	5.66E+00	5.93E+01	2.47E+01	1.39E+01	5,91E+01	-	2.78E+00	8.40E-02	5.28E+01	1.57E+00	5.72E+01	4,66E+02	-1,10E+01
WDP [m3 of deprivation eq in the world]	1.42E+01	1.44E-02	5.94E-01	7.39E-02	5.98E-01	7,90E+00	-	8.47E-03	4.23E-03	3.97E+00	7.51E-03	4.31E+00	2,73E+01	-3,09E-02
Particulate matter [Incidence of disease]	3.80E-07	2.38E-08	7.11E-08	1.28E-07	2.76E-08	2,93E-07	-	1.47E-08	3.87E-10	2.05E-07	1.13E-08	2.21E-07	1,14E-06	-2,81E-08

Ionising radiation [kBq235U éq]	4.98E-01	2.44E-02	5.13E-01	1.07E-01	4.76E-02	1,73E-01	-	1.21E-02	1.25E-03	2.30E-01	7.19E-03	2.49E-01	1,60E+00	-3,53E-02
Ecotoxicity, freshwater [CTUe]	2.09E+02	4.07E+00	2.80E+01	1.92E+01	1.23E+01	2,34E+02	-	2.18E+00	1.46E-01	1.01E+03	2.66E+01	1.09E+03	1,52E+03	-3,57E+00
Human toxicity, cancer [CTUh]	7.29E-09	1.90E-10	2.26E-09	6.42E-10	5.76E-10	1,12E-08	-	7.02E-11	2.14E-11	5.53E-09	4.89E-11	6.00E-09	2,78E-08	-2,00E-10
Human toxicity, non-cancer [CTUh]	1.95E-07	3.64E-09	1.87E-08	1.92E-08	1.06E-08	1,45E-07	-	2.21E-09	1.48E-10	2.47E-07	4.94E-09	2.68E-07	6,41E-07	-3,03E-09
Land use [No dimension]	4.50E+01	2.74E+00	6.09E+01	1.67E+01	5.44E+00	1,66E+02	-	1.94E+00	3.28E-02	1.56E+01	4.08E+00	1.66E+01	3,15E+02	-3,31E+00

Table 29. Resources, waste categories and outgoing flows over the ESL of 25 years – Norway

Parameter	A1	A2	A3	A4	A5	B2	B4	C2	C3 – 100% recycling*	C4 – 8 % Landfill & 92% incineration	C4 – 100% Landfill*	C4 – 100% Incineration *	Total life cycle (A1-C4)	D
RPRE [MJ, LHV]	1.74E+01	6.47E-02	7.17E+00	3.46E-01	7.95E+00	8.72E+01	-	3.98E-02	5.44E-01	6.10E+00	6.81E-02	6.63E+00	1.26E+02	-5.69E+00
RPRM [MJ, LHV]	-	-	6.57E+00	-	-6.67E+00	-	-	-	-	-	-	-	-1.00E-01	-
RPRT [MJ, LHV]	1.74E+01	6.47E-02	1.37E+01	3.46E-01	1.28E+00	8.72E+01	-	3.98E-02	5.44E-01	6.10E+00	6.81E-02	6.63E+00	1.26E+02	-5.69E+00
NRPRE [MJ, LHV]	1.45E+02	5.66E+00	5.93E+01	2.47E+01	9.98E+00	2.60E+01	-	2.78E+00	8.25E-02	1.81E+02	1.57E+00	1.97E+02	4.55E+02	-1.10E+01
NRPRM [MJ, LHV]	1.45E+02	-	-1.01E-02	-	5.69E+00	3.46E+01	-	-	-	-1.29E+02	-	-1.40E+02	5.66E+01	-
NRPRT [MJ, LHV]	2.91E+02	5.66E+00	5.93E+01	2.47E+01	1.57E+01	6.06E+01	-	2.78E+00	8.25E-02	5.26E+01	1.57E+00	5.71E+01	5.12E+02	-1.10E+01
SM [kg]	-	-	1.79E-01	-	7.17E-03	-	-	-	-	-	-	-	1.87E-01	-
RSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FW [m3]	1.98E-01	5.02E-04	2.05E-02	2.69E-03	9.28E-03	6.48E-01	-	3.09E-04	4.00E-03	1.07E-01	1.98E-03	1.16E-01	9.87E-01	-3.30E-02
RE [MJ]	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HWD [kg]	3.92E-01	4.67E-03	4.07E-02	1.83E-02	2.41E-02	2.74E-01	-	2.04E-03	-	8.14E-01	1.81E-03	8.84E-01	1.57E+00	-3.00E-03
NHWD [kg]	3.93E+00	2.19E-01	1.58E+00	1.39E+00	6.29E-01	2.50E+00	-	1.62E-01	8.78E-04	3.81E+00	7.01E+00	3.54E+00	1.42E+01	-5.30E-02
HLRW [kg]	7.46E-05	3.14E-07	9.52E-05	1.79E-06	6.93E-06	1.59E-05	-	2.07E-07	9.35E-03	3.33E-05	1.80E-07	3.62E-05	2.28E-04	-1.17E-06
ILLRW [kg]	3.86E-04	3.83E-05	4.03E-04	1.65E-04	4.25E-05	1.21E-04	-	1.86E-05	1.01E-07	1.76E-04	9.93E-06	1.90E-04	1.35E-03	-4.35E-05
CRU [kg]	-	-	-	-	-	-	-	-	5.37E-07	-	-	-	-	-
MFR [kg]	-	-	1.16E-01	-	4.63E-03	-	-	-	-	-	-	-	1.20E-01	-
MER [kg]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EE [MJ, LHV]	-	-	5.35E-01	-	1.79E+00	-	-	-	-	4.47E+01	-	4.86E+01	4.70E+01	-

*These scenarios are fictitious, they do not reflect the end of life considered in this study.

Table 30. Carbon Emissions and Removals over the ESL of 25 years – Norway

PARAMETER	A1	A2	A3	A4	A5	B1	B2	B4	C2	C4	TOTAL LIFE CYCLE (A1-C4)
BCRP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCEP [kg CO2]	-	-	-	-	-	-	-	-	-	-	-
BCRK [kg CO2]	-	-	7.83E-01	-	-	-	-	-	-	-	7.83E-01
BCEK [kg CO2]	-	-	-	-	7.83E-01	-	-	-	-	-	7.83E-01
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

5. LCA Interpretation

Results for 75 years

Figure 4: Graph depicting selection of impact indicator results calculated according to EN 15804, for 75 years – Europe

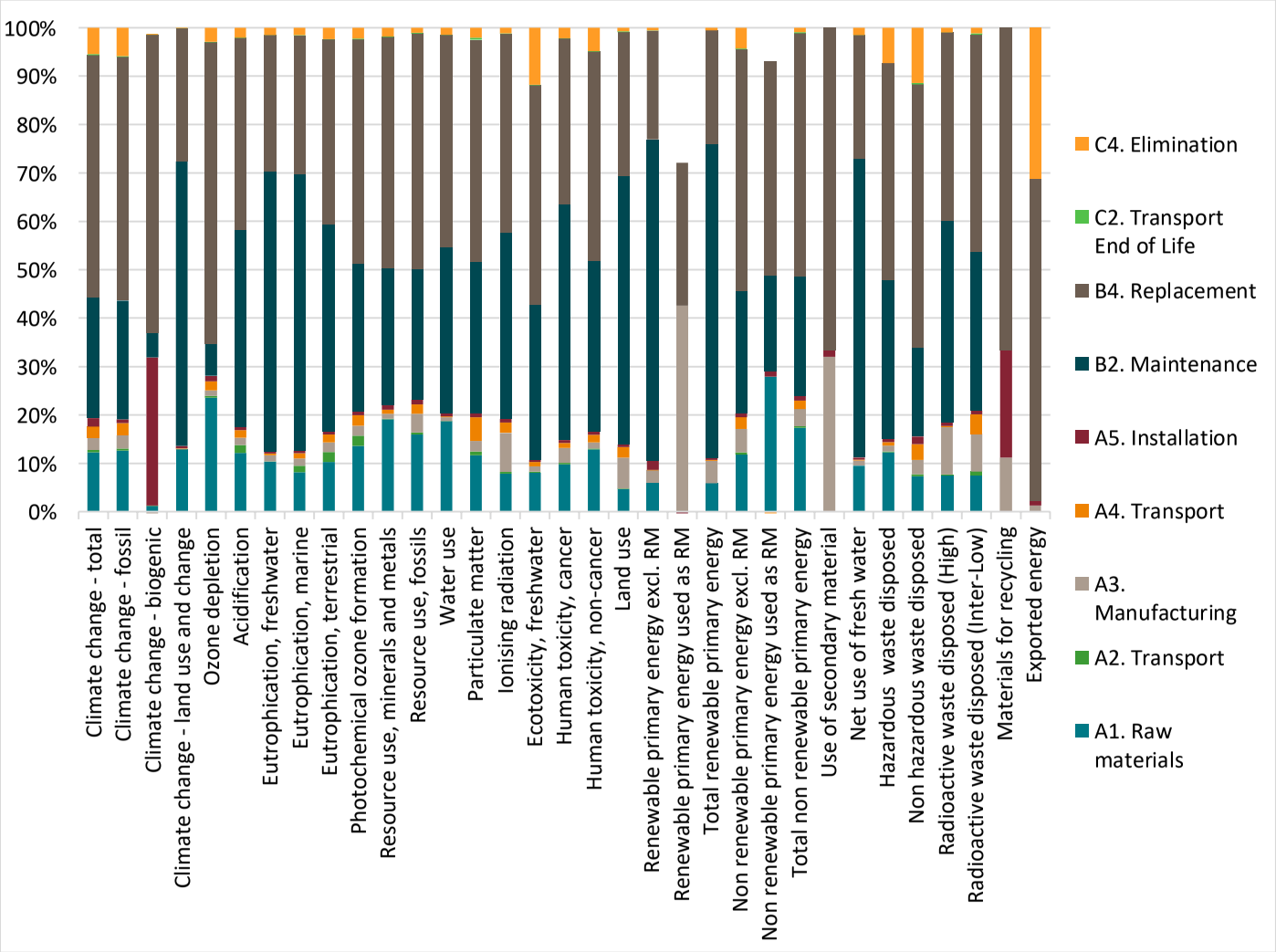
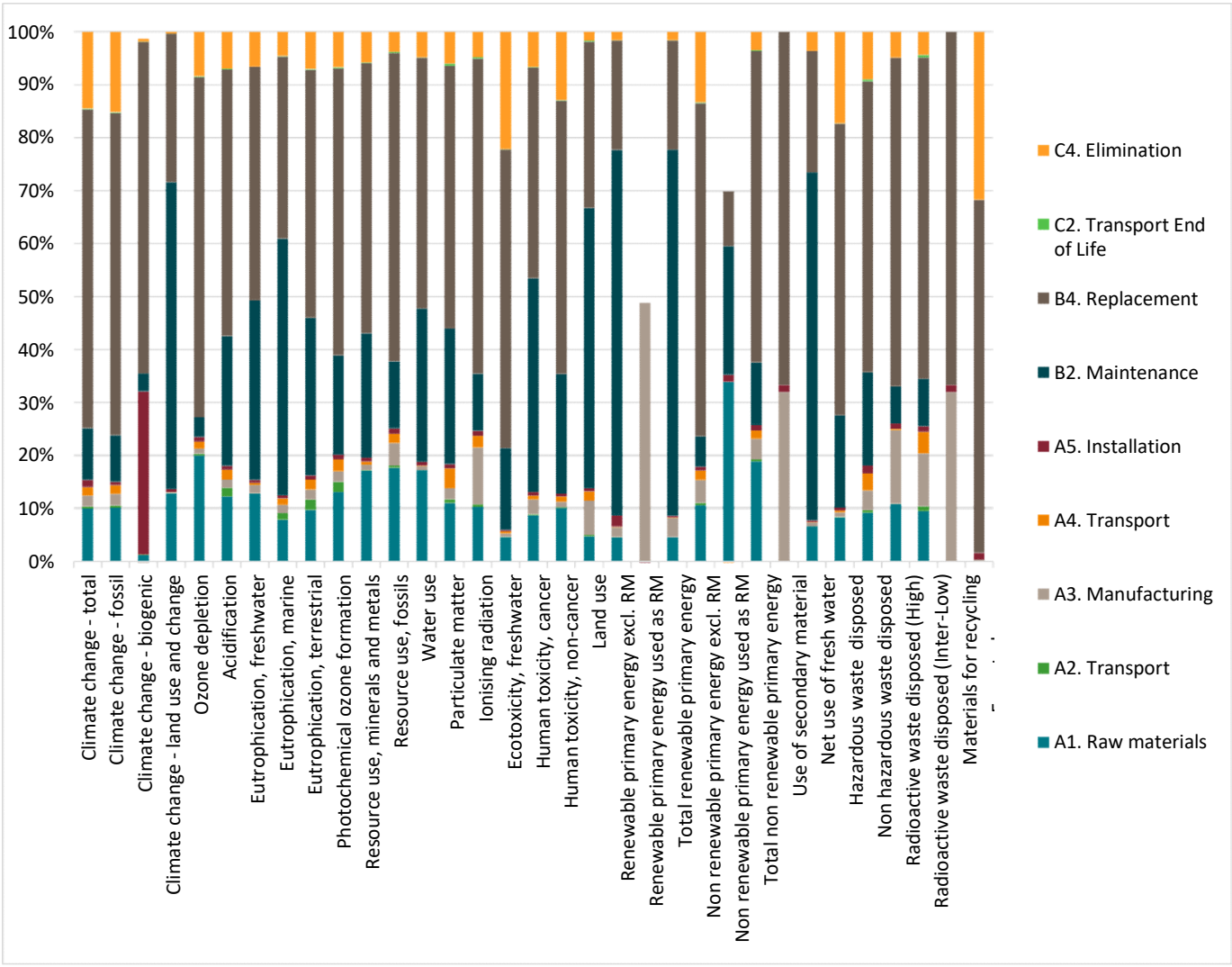


Figure 5: Graph depicting selection of impact indicator results calculated according to EN 15804, for 75 years – Norway



For both scenarios, the primary contributor to the environmental impacts of the product is B4 – Replacement, which requires the production of two additional products and A1 – Extraction and transformation of the raw materials is impactant. Then comes B2 – Maintenance stage because of the scenario of both long reference service life (RSL) of 75 years and the assumption of a weekly cleaning by using a machine and detergent. Stage C4 – End of lifethe has more impact for norway because of the incineration at the end of life.

Results for 25 years

Figure 6: Graph depicting selection of impact indicator results calculated according to EN 15804, for 25 years – Europe

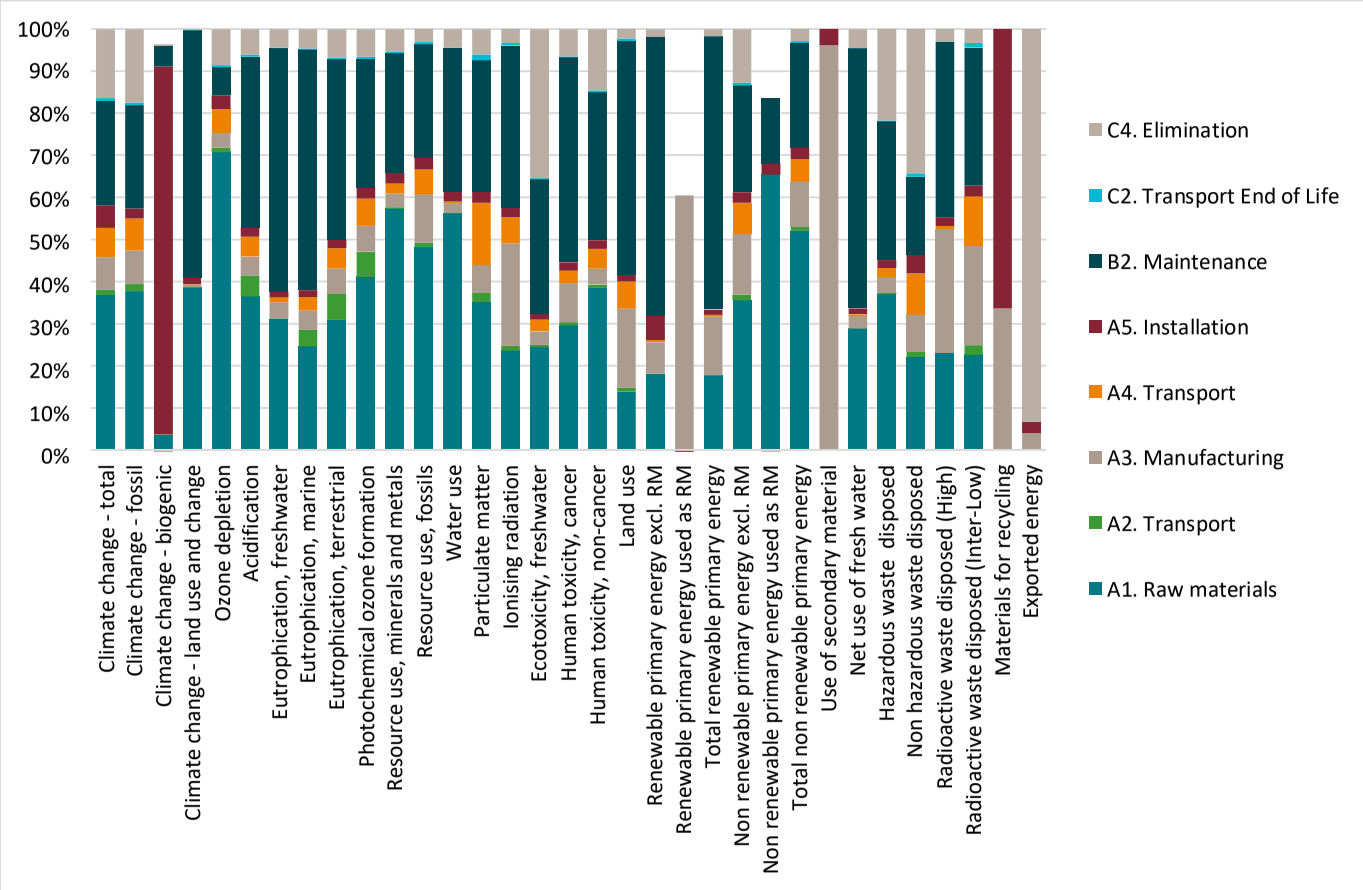
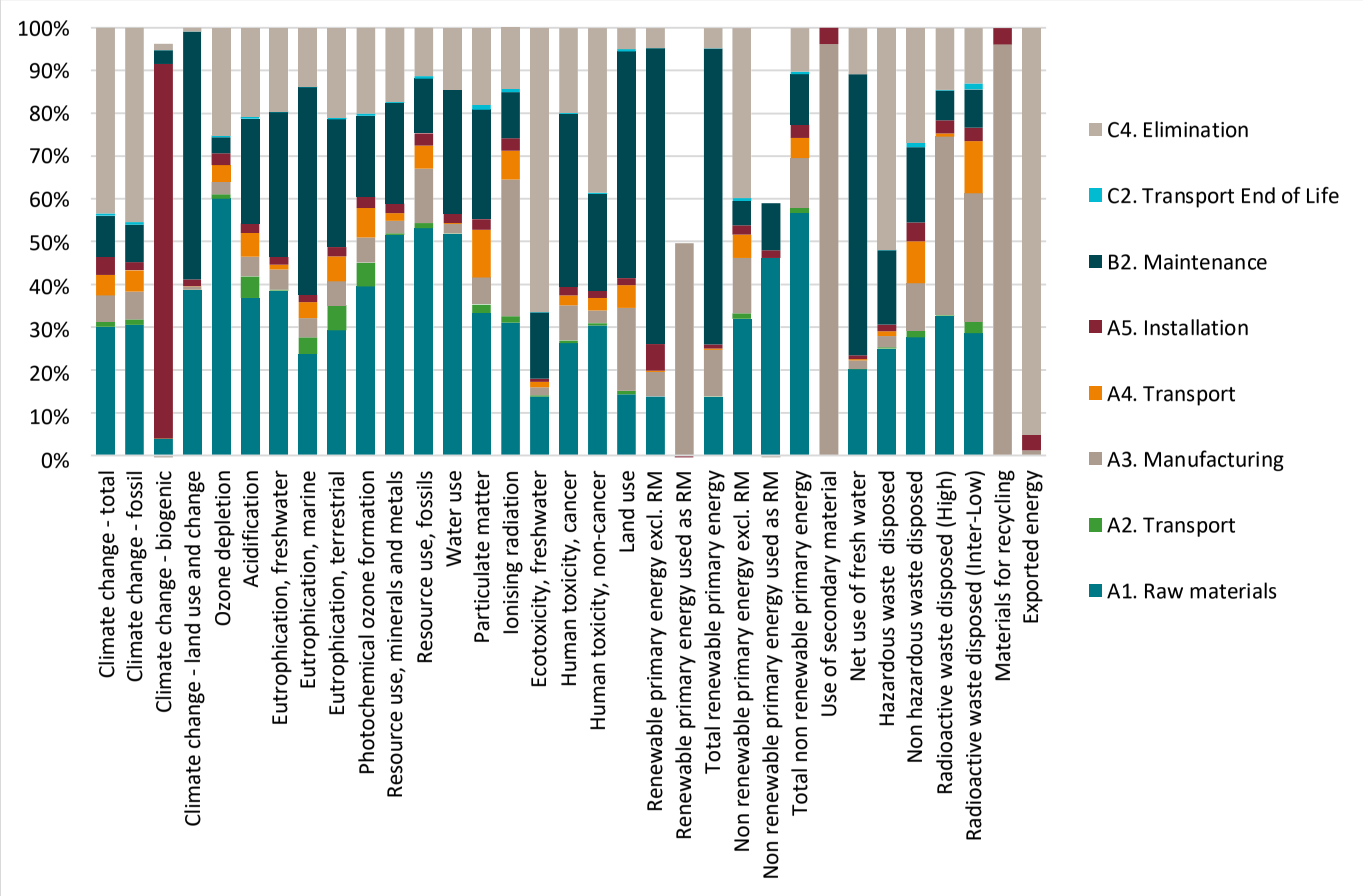


Figure 7: Graph depicting selection of impact indicator results calculated according to EN 15804, for 25 years – Norway



6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

Gerflor uses 100% certified renewable electricity in its plants.

No substances required to be reported as hazardous are associated with the production of this product.

6.2. Environment and Health During Installation

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

6.3. Environment and Health During the use stage

The product is certified FloorScore. The measured concentration of total volatile organic compounds (TVOC) is less than/equal to 0.5 mg/m^3 (in accordance with CDPH/EHLB Standard Method v1.2-2017).

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.
Class 1 when tested in accordance with ASTM E 648. Standard Test Method for Critical Radiant Flux
Flaming & Non-Flaming when tested in accordance with ASTM E 662. Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

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

M1 Standard
Certificate n°3918

6.7. Further Information

Additional information can be found in https://www.gerflor.com/

7. Supporting Documentation

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

8. References

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

EN 15804
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. UL Environnment. https://industries.ul.com/environment

UL 10010-7. PCR Part B
PCR - Part B: Flooring EPD Requirements. Second Edition. Dated September 28. 2018. UL Environment. https://www.ul.com/

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

9. Contact information

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