



# Environmental Product Declaration

## Polymer Bitumen Waterproofing Membranes

- ASSO 4 PL CLASSIC
- ASSO MINERALE 4 PL CLASSIC
- ASSO MINERALE 4,5 PL CLASSIC
- GUMMIFLEX 3 PL CLASSIC
- ARDESIA 4 PL CLASSIC
- ARDESIA 4,5 PL CLASSIC
- GUMMIVAL 3 PL CLASSIC
- GUMMIVAL 4 PL CLASSIC
- GUMMIVAL ARDESIA 4 PL CLASSIC
- GUMMIVAL ARDESIA 4,5 PL CLASSIC



SINCE 1928  
**Valli Zabban**  
WATERPROOFING SYSTEMS

PERFORMANCE, TECHNOLOGIES AND SUSTAINABILITY

Production site Valli Zabban S.p.A. • Via del Bosco, 27 • 60012 Trecastelli (AN)

Environmental product declaration in accordance with  
**ISO 14025 and EN 15804:2012+A2:2019**

Program operator: **EPDItaly**

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SINCE 1928

# Valli Zabban

## WATERPROOFING SYSTEMS

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## GENERAL INFORMATION

<b>PROGRAM OPERATOR</b>	EPDItaly® - Via De Castillia, n° 10, 20124 - Milano - <a href="http://www.epditaly.it">www.epditaly.it</a>
<b>EPD TYPE</b>	Product-specific.
<b>TOOL</b>	The EPD was drawn up with the support of the LCA Tool P43M03 rev. 0, 07/04/2023. The Tool has been certified by ICMQ S.p.A.
<b>PRODUCT CLASSIFICATION</b>	UN CPC: 15330 - Bitumen and asphalt, natural; asphaltites and asphaltic rock.
<b>DECLARED PRODUCT</b>	<ul style="list-style-type: none"> <li>• ASSO 4 PL CLASSIC</li> <li>• ASSO MINERALE 4 PL CLASSIC</li> <li>• ASSO MINERALE 4,5 PL CLASSIC</li> <li>• GUMMIFLEX 3 PL CLASSIC</li> <li>• ARDESIA 4 PL CLASSIC</li> <li>• ARDESIA 4,5 PL CLASSIC</li> <li>• GUMMIVAL 3 PL CLASSIC</li> <li>• GUMMIVAL 4 PL CLASSIC</li> <li>• GUMMIVAL ARDESIA 4 PL CLASSIC</li> <li>• GUMMIVAL ARDESIA 4,5 PL CLASSIC</li> </ul>
<b>PRODUCT DESCRIPTION AND APPLICATION</b>	The products analyzed are bitumen/polymer waterproofing membranes, made from distilled bitumen modified with APAO polyolefins and stabilized reinforced polyester armor, used for waterproofing new civil engineering works and renovations.
<b>DECLARED UNIT</b>	1 m <sup>2</sup> (packaging included).
<b>EPD OWNER</b>	Valli Zabban S.p.A. Via di le Prata 103 - 50041 Calenzano (FI).
<b>PLANTS INVOLVED</b>	Via del Bosco, 27 - 60012 Trecastelli (AN).
<b>ADDITIONAL INFORMATION</b>	Contacts: 0717950276. Website: <a href="https://vallizabban.com/">https://vallizabban.com/</a> Referent: Agnese Massaccesi (Manager QASE).
<b>REFERENCE PCR</b>	PCR ICMQ -001/15 - rev.3, 02/12/2019 - Products and services for construction.
<b>INDIPENDENT CHECK</b>	Third party verifier: ICMQ S.p.A. Via De Castillia, 10 - 20124 Milano ( <a href="http://www.icmq.it">www.icmq.it</a> )
<b>TECHNICAL SUPPORT</b>	QualityNet srl - Via Aquileia, 56 - 35035 Mestrino (PD) Italia. EcamRicert srl - Viale del Lavoro, 6 - 36030 Monte di Malo (VI) Italia.
<b>RESPONSIBILITY</b>	Valli Zabban S.p.A. relieves EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly declines any responsibility for the information, data and results provided by the EPD Owner for evaluation of the life cycle assessment.

Environmental statements published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019.

EN 15804 (or any other relevant European standard) is the reference framework for PCRs (if applicable).

Independent third-party verification of the declaration and data, according to ISO 14025:2006

Interna

Esterna

Third party verifier: verification performed by ICMQ S.p.A., Via Gaetano De Castillia, 10 - 20124 Milano (MI) Italia.  
Accredited by ACCREDIA.

# 1 INTRODUCTION

Type III Environmental Declarations contain verifiable and accurate performance information about environmental aspects of a product, quantified on the basis of a life cycle assessment.

The goal is to produce reliable expressed information on a common basis that allow for a comparison of environmental performance between the products that carry out the same function.

In this perspective of products' sustainability, **Type III Environmental Declarations** are developed in accordance with the requirements and standards

prescriptions dictated by the voluntary **UNI standard EN ISO 14025:2010**.

To ensure that the LCAs studies are conducted consistently for all products falling within the same category rules, it is necessary to respect precise methodologies.



## 1.1 - THE COMPANY

The story of Valli Zabban began over ninety years ago. It was 1928 when Idrobitume Zabban was founded in Bologna for the production, transportation and application of bitumen. Some years later in 1945, the Company Edile Stradale Valli Giulio & C. was formed, the leading Italian production hub for transforming bitumen for road paving and building waterproofing. In 2015 the Acoustic Division was added, in a merger by acquisition of the company Aetolia VZ srl. Valli Zabban is today a modern Company, a leader in Italy and in the world, in the transformation of bitumen through its three sectors: **Road Technologies, Waterproofing Systems and Rubber Technologies.**

consumption and manufacturing using recycling and re-use, cutting down waste and implementing the principles of the circular economy – and for achieving all of these is required a high level of technological know-how along with a program of substantial investments that are constant over time. But if today the name of Valli Zabban is becoming synonymous of responsibility and environmental sustainability, the merit must also and above all be attributed to the high professionalism of its human resources, that are the true Company assets.

Valli Zabban believes that development must be sustainable for humankind and for the environment. The Company is aware of the great commitment that this philosophy brings. There are so many goals – cutting down pollutant emissions, reducing energy



# Valli Zabban

SINCE 1928



## 1.2 - PRODUCTS

This EPD reports the environmental performance of these products:

- **Asso 4 PL Classic**
- **Asso Minerale 4 PL Classic**
- **Asso Minerale 4,5 PL Classic**
- **Gummiflex 3 PL Classic**
- **Ardesia 4 PL Classic**
- **Ardesia 4,5 PL Classic**
- **Gummival 3 PL Classic**
- **Gummival 4 PL Classic**

- **Gummival Ardesia 4 PL Classic**
- **Gummival Ardesia 4,5 PL Classic**

The products analyzed are bitumen/polymer waterproofing membranes for the circular economy at high recycled element content, LEED compliant, made from distilled bitumen modified with APAO polyolefins and stabilized reinforced polyester armor, used for waterproofing new civil engineering works and renovations.

Table 1 • List of products.

Product	Thickness [mm]/Weight [Kg]	Roll [m]
<b>ASSO 4 PL CLASSIC</b>	4 mm	1x8
<b>ASSO MINERALE 4 PL CLASSIC</b>	4 Kg	1x8
<b>ASSO MINERALE 4,5 PL CLASSIC</b>	4,5 Kg	1x8
<b>GUMMIFLEX 3 PL CLASSIC</b>	3 mm	1x8
<b>ARDESIA 4 PL CLASSIC</b>	4 Kg	1x8
<b>ARDESIA 4,5 PL CLASSIC</b>	4,5 Kg	1x8
<b>GUMMIVAL 3 PL CLASSIC</b>	3 mm	1x8
<b>GUMMIVAL 4 PL CLASSIC</b>	4 mm	1x8
<b>GUMMIVAL ARDESIA 4 PL CLASSIC</b>	4 Kg	1x8
<b>GUMMIVAL ARDESIA 4,5 PL CLASSIC</b>	4,5 Kg	1x8

The products are made from raw materials containing recycled materials.

Table 2 • Composition.

Materials	Percentage [%]
<b>Bitumen</b>	40 - 60
<b>Polymers</b>	10 - 15 (10% Recycled)
<b>Aggregates</b>	10 - 30
<b>Reinforcing material</b>	0 - 5 (4% Recycled)
<b>Other additives</b>	10 - 15% (10% Recycled)

## 2 SCOPE AND EPD ANALYSIS

### 2.1 - SYSTEM BOUNDARIES

The purpose of defining system boundaries is to circumscribe a spatial, temporal and operational limit in which to collect reliable data that reflect the real environmental performance of the system and give a complete description about it. The detail and the extent of the study are defined by the

boundaries that allow to determine the unit processes to be included in the model. Along these unit processes, the macro-consumptions involved in the production of the product, and on which the calculation model was set up and analyzed, were identified. (Figure 1, Figure 3).

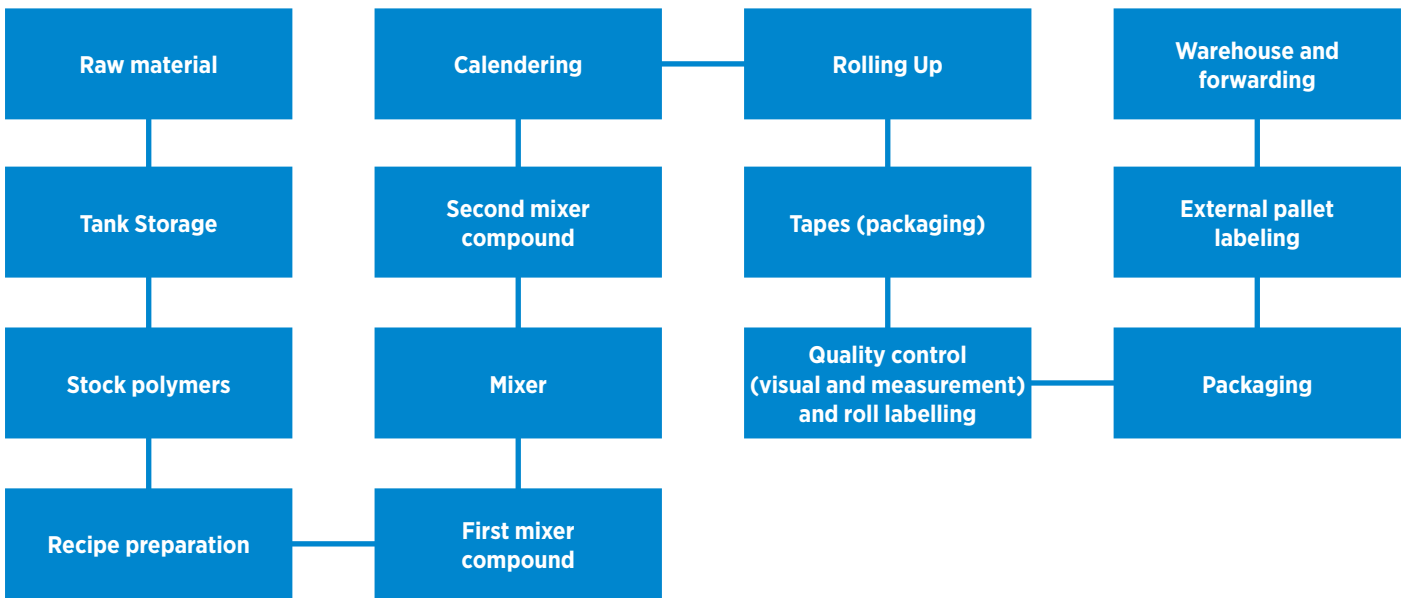


Figure 1 • Production process flow chart.

The analytical approach made it possible to study the products, evaluating them as systems affected by factors of inputs and outputs and consequently subject to work cycles producing environmental impacts in compliance with the reference PCR.

The company Valli Zabban S.p.A. for the work performed, regarding the products considered, at the establishment mentioned above, does not rely on subcontractors.

The production facility is located in:  
**Via del Bosco, 27 - 60012 Trecastelli (AN).**



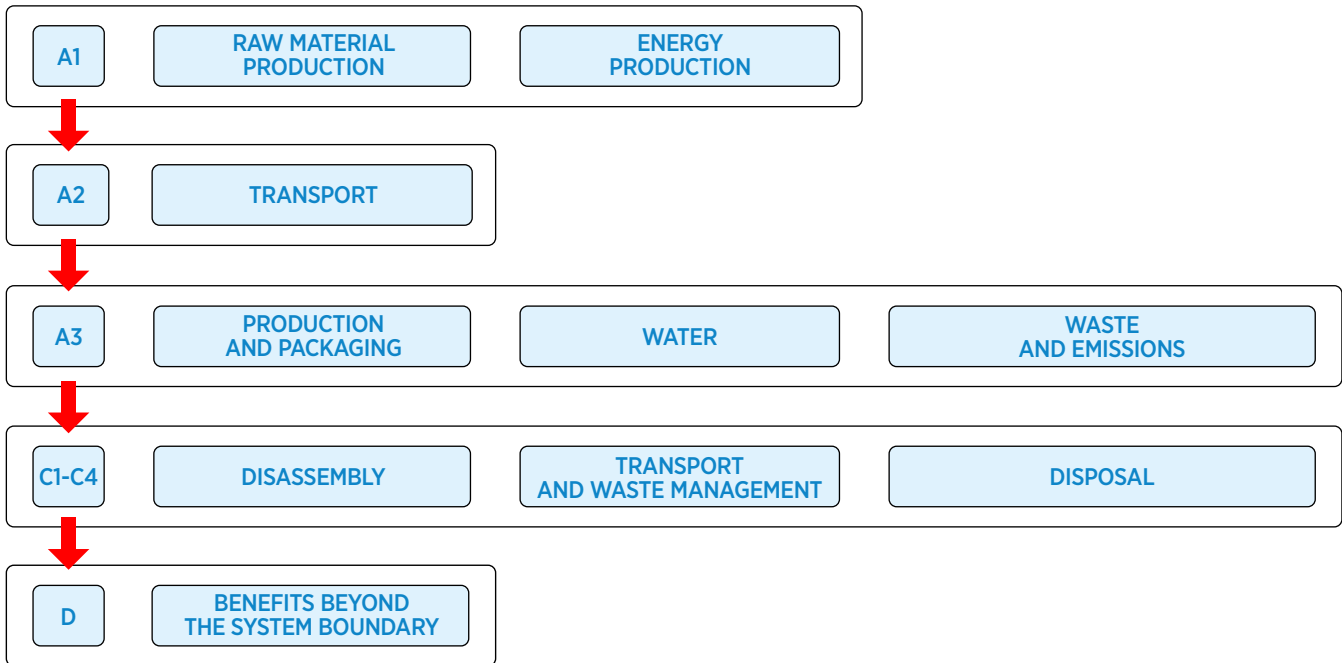


Figure 2 • Life cycle flowchart.

## PRODUCTION PROCESS

Valli Zabban has established itself at the top of the bitumen waterproofing sector in civil construction and infrastructures in Italy and throughout the world.

For over a quarter of a century, Valli Zabban waterproofing membranes have been protecting roofs, bridges, viaducts, foundations and every other type of civil engineering work from water, one of the most common elements and at the same time one of the most difficult of all to contain. Success is due as usual to constant research, an absolute vocation for technological innovation and the total quality guaranteed by the products as well as the services offered to customers.

The raw materials that make up the waterproofing membranes are:

- **compound** (bitumen, filler, polymers PP-PE-SBS recycled 10 - 15 %);
- **reinforcement non-woven polyester or fiberglass** (recycled 0 - 5 %) **and others additives.**
- **exterior finishes:** PE film and/or sand and/or slate scales.

Depending on the type of waterproofing membranes to be produced, Valli Zabban can: create different compounds varying the percentages and types of raw materials, use different weights of armor and different exterior finishes.

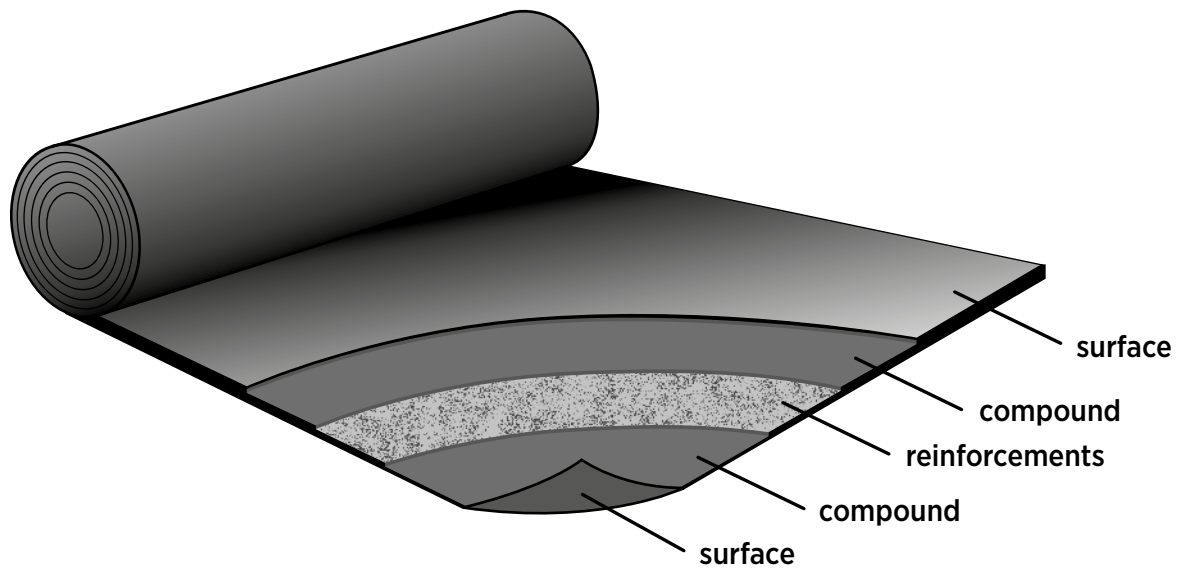


Figure 3 • Waterproofing membranes composition.

The Trecastelli plant for bitumen-polymer membrane waterproofing production consists of:

- **diathermic oil heat generator**
- **heated storage tanks for bitumen**
- **storage silos for filler**
- **mixer compound**
- **production line**

The bitumen is supplied in the molten state (150 – 160 °C) from the refinery and is stored in tanks. The filler is transported at ambient temperature from pressure tanks directly in storage silos. The other raw materials arrive at the factory with trucks with big curtainsiders bag and are transported to the warehouse using diesel forklifts.

When preparing the mix, the bitumen is transferred, through suitable piping, in the melter. Subsequently, according to the formulation of the compound to be produced and after raising the temperatures to approx 200°C, the following are introduced: the polymers (PP-PE-SBS), the filler and a percentage of various additives. After fusion, the compound is

transferred to the “fuser of storage” and sent only later in the impregnation tank at the beginning of the production line, ready to be processed.

In the production line department, the reinforcement, in advance placed at the beginning of the line, it is immersed in the tub, soaked and laminated through calenders that regulate the thickness of the product according to production requests. The resulting product undergoes a slow cooling process by special rollers equipped with a system of cooling down. Then the membrane in the cooling phase is coupled to the external finishes and embossed with special rollers. In the final part of the production line, the membrane is rolled up, taped, identified and palletised. The individual rolls on wooden pallets are sent to the kiln, where it is made the packaging with polyethylene heat-shrink caps. The pallets are transported to the finished products warehouse using diesel forklifts trucks.



PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							CONSTRUCTION PROCESS STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Decostruction, demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

Figure 4 • Description of the system boundary modules. X Module Declared; MND Module not declared.

**SOFTWARE:** SimaPro 9

**DATABASE:** Ecoinvent 3.8

**GEOGRAPHICAL REPRESENTATIVENESS DESCRIPTION:** Italy and UE Country.

**EPD TYPE:** Product-specific.

**MARKET:** Global.

The scenarios adopted for the modeling of the modules C1, C2, C3, C4 have been considered and assumed in the following way:

- Impacts associated with demolition (C1) are negligible assumptions.
- We assume a transport distance from recovery platform equal to (C2) 50 km.

For the waste transport distance, a distance equal to the radius of a metropolitan city has been taken. In detail, the reference was the city of Milan.

<http://www.affariregionali.it/media/170177/dossier-citt%C3%A0-metropolitana-di-milano.pdf>



It is assumed that the product can be recovered totally at the end of its life for these reasons:

- A "recovery" activity was planned for Module C3;
- A disposal activity was planned for Module C4;

- For module D the potentials environmental benefits have been defined beyond the system net of components already recovered within the recipe.

## 2.2 - REFERENCE YEAR, GEOGRAPHICAL AND TECHNOLOGICAL REPRESENTATIVENESS DESCRIPTION

Time boundaries include the period that goes from January 2022 to December 2022, a time frame regarded as representative of the assets of the Company; the results of the study will go framed within these boundaries.

The geographical boundaries of the study are to be identified in the Italian international and national

territory (in particular for the manufacturing phase). Technological boundaries refer to the technological level average relative to the specific time context/geographical area of these boundaries.

## 2.3 - CUT-OFF RULES AND ASSUMPTIONS

During the study of the product, the following flows were included in the cut-off: additive transport and management of waste similar to urban waste.

The VOCs sent to the thermal power plant are not excluded since they would account for less than 1% compared to CO<sub>2</sub> emissions.

## 2.4 - DECLARED UNIT

The declared unit then constitutes the reference for the combination of flows attributed to the object analysis and combination of environmental impacts relating to the modules recalled. According

to the directives of the reference standard and the product's rule, is considered as a declared unit, expressed in m<sup>2</sup>: **1m<sup>2</sup> (packaging included)**.

## 2.5 - ALLOCATION

Inventory data were related to the total production in m<sup>2</sup> in the reference year to be able to arrive at consumption according to the chosen declared unit. Therefore, in this study was made an attempt to divide the data in and out while maintaining the principle of modularity: because of this, materials

and energy flows to and from the environment are then assigned to the module in which they occur. The allocation criteria adopted for the LCA model comply with the reference standards (EN 15804, ISO 14044) and are mainly based on the m<sup>2</sup> of production.

## 3 ENVIRONMENTAL PERFORMANCE

The environmental profile of the product along the modules information investigated was calculated according to the PCR reference. Impact assessment is developed along the characteristic phases of the LCIA – Life Cycle Impact Assessment. The calculation software SimaPro was used and the "ECOINVENT 3.8" databases have been selected for the processing of the inventory and

for the calculation of the eco-profiles. For the characterization of inventory data, with reference to the various types of impact on which the system in question acts, the "EN 15804 +A2 Method" has been applied as calculation method. The environmental performances are shown in the following tables for the formats indicated in paragraph 2.4.

Table 3 • Environmental performance.

ASSO 4 PL CLASSIC								
Indicator	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,75E+00	0,00E+00	3,57E-02	3,61E-02	0,00E+00	2,82E+00	-1,55E-01
GWP-fossil	kg CO2 eq	2,73E+00	0,00E+00	3,56E-02	3,55E-02	0,00E+00	2,80E+00	-1,54E-01
GWP-biogenic	kg CO2 eq	1,00E-02	0,00E+00	9,50E-05	5,22E-04	0,00E+00	1,06E-02	-5,21E-04
GWP-luluc	kg CO2 eq	1,44E-03	0,00E+00	1,41E-05	2,79E-05	0,00E+00	1,48E-03	-5,19E-04
ODP	kg CFC11 eq	3,75E-06	0,00E+00	8,31E-09	7,27E-09	0,00E+00	3,76E-06	-2,99E-08
AP	mol H+ eq	1,82E-02	0,00E+00	1,80E-04	3,00E-04	0,00E+00	1,87E-02	-1,44E-03
EP-freshwater	kg P eq	4,18E-04	0,00E+00	2,31E-06	9,91E-06	0,00E+00	4,30E-04	-1,74E-05
EP-marine	kg N eq	3,19E-03	0,00E+00	6,21E-05	1,14E-04	0,00E+00	3,37E-03	-4,35E-04
EP-terrestrial	mol N eq	3,55E-02	0,00E+00	6,79E-04	1,23E-03	0,00E+00	3,74E-02	-4,77E-03
POCP	kg NMVOC eq	9,51E-03	0,00E+00	1,66E-04	2,98E-04	0,00E+00	9,97E-03	-1,17E-03
ADP-minerals&metals**	kg Sb eq	2,01E-05	0,00E+00	1,25E-07	1,17E-07	0,00E+00	2,03E-05	-9,03E-07
ADP-fossil**	MJ	1,48E+02	0,00E+00	5,32E-01	5,47E-01	0,00E+00	1,50E+02	-2,14E+00
WDP**	m3 depriv.	6,36E-01	0,00E+00	1,63E-03	1,04E-02	0,00E+00	6,48E-01	-1,90E-01
PM	disease inc.	1,02E-07	0,00E+00	2,57E-09	2,33E-08	0,00E+00	1,28E-07	-1,45E-08
IRP*	kBq U-235 eq	6,60E-01	0,00E+00	2,79E-03	6,03E-03	0,00E+00	6,69E-01	-1,12E-02
ETP-fw**	CTUe	9,39E+01	0,00E+00	4,24E-01	4,18E-01	0,00E+00	9,48E+01	-2,08E+00
HTP-nc**	CTUh	3,46E-08	0,00E+00	4,43E-10	3,42E-10	0,00E+00	3,54E-08	-2,14E-09
HTP-c**	CTUh	1,51E-09	0,00E+00	1,37E-11	1,86E-11	0,00E+00	1,54E-09	-1,19E-10
SQP**	Pt	2,09E+01	0,00E+00	3,87E-01	6,29E-01	0,00E+00	2,20E+01	-4,54E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP- freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

**\*Disclaimer** – 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.

**\*\*Disclaimer** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experiences with the indicator.

<sup>1</sup> The estimated impact results are only the related statements not indicating the endpoints of the indicator, exceeding threshold values, safety margins or risks.

Table 4 • Use of resources.

ASSO 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,75E+00	0,00E+00	7,66E-03	3,36E-02	0,00E+00	1,79E+00	-4,80E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,83E+00	0,00E+00	7,66E-03	3,36E-02	0,00E+00	1,87E+00	-4,80E-02
PENRE	MJ	5,25E+01	0,00E+00	5,43E-01	6,20E-01	0,00E+00	5,37E+01	-2,20E+00
PENRM	MJ	9,91E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,91E+01	0,00E+00
PENRT	MJ	1,52E+02	0,00E+00	5,43E-01	6,20E-01	0,00E+00	1,53E+02	-2,20E+00
SM	Kg	5,14E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,14E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,98E-02	0,00E+00	5,66E-05	3,34E-04	0,00E+00	3,02E-02	-4,51E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;  
**PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material;  
**RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 5 • Output flow and waste.

ASSO 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	7,90E-04	0,00E+00	1,51E-06	1,27E-06	0,00E+00	7,93E-04	-1,40E-05
NHWD	kg	6,57E-01	0,00E+00	2,98E-02	8,10E-01	0,00E+00	1,50E+00	-1,06E-01
RWD	kg	8,22E-04	0,00E+00	3,91E-06	4,41E-06	0,00E+00	8,30E-04	-1,51E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,61E+00	0,00E+00	4,61E+00	-4,61E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use;  
**MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 6 • Environmental performance.

ASSO MINERALE 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,61E+00	0,00E+00	3,38E-02	3,42E-02	0,00E+00	2,68E+00	-1,49E-01
GWP-fossil	kg CO2 eq	2,60E+00	0,00E+00	3,37E-02	3,37E-02	0,00E+00	2,67E+00	-1,48E-01
GWP-biogenic	kg CO2 eq	8,64E-03	0,00E+00	9,00E-05	4,95E-04	0,00E+00	9,22E-03	-4,98E-04
GWP-luluc	kg CO2 eq	1,38E-03	0,00E+00	1,34E-05	2,64E-05	0,00E+00	1,42E-03	-4,97E-04
ODP	kg CFC11 eq	3,32E-06	0,00E+00	7,87E-09	6,88E-09	0,00E+00	3,34E-06	-2,86E-08
AP	mol H+ eq	1,62E-02	0,00E+00	1,71E-04	2,85E-04	0,00E+00	1,66E-02	-1,37E-03
EP-freshwater	kg P eq	3,87E-04	0,00E+00	2,19E-06	9,39E-06	0,00E+00	3,99E-04	-1,66E-05
EP-marine	kg N eq	3,07E-03	0,00E+00	5,89E-05	1,08E-04	0,00E+00	3,23E-03	-4,16E-04
EP-terrestrial	mol N eq	3,41E-02	0,00E+00	6,44E-04	1,16E-03	0,00E+00	3,59E-02	-4,56E-03
POCP	kg NMVOC eq	8,91E-03	0,00E+00	1,57E-04	2,82E-04	0,00E+00	9,35E-03	-1,12E-03
ADP-minerals&metals**	kg Sb eq	1,82E-05	0,00E+00	1,18E-07	1,10E-07	0,00E+00	1,84E-05	-8,64E-07
ADP-fossil**	MJ	1,21E+02	0,00E+00	5,04E-01	5,18E-01	0,00E+00	1,22E+02	-2,05E+00
WDP**	m3 depriv.	5,64E-01	0,00E+00	1,54E-03	9,86E-03	0,00E+00	5,75E-01	-1,82E-01
PM	disease inc.	1,05E-07	0,00E+00	2,43E-09	2,21E-08	0,00E+00	1,30E-07	-1,39E-08
IRP*	kBq U-235 eq	5,45E-01	0,00E+00	2,64E-03	5,72E-03	0,00E+00	5,54E-01	-1,07E-02
ETP-fw**	CTUe	7,77E+01	0,00E+00	4,01E-01	3,96E-01	0,00E+00	7,85E+01	-1,99E+00
HTP-nc**	CTUh	3,18E-08	0,00E+00	4,19E-10	3,24E-10	0,00E+00	3,25E-08	-2,05E-09
HTP-c**	CTUh	1,39E-09	0,00E+00	1,30E-11	1,76E-11	0,00E+00	1,42E-09	-1,14E-10
SQP**	Pt	1,95E+01	0,00E+00	3,66E-01	5,96E-01	0,00E+00	2,05E+01	-4,34E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

**\*Disclaimer** – 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.

**\*\*Disclaimer** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experiences with the indicator.

Table 7 • Use of resources.

ASSO MINERALE 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,62E+00	0,00E+00	7,25E-03	3,19E-02	0,00E+00	1,66E+00	-4,59E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,70E+00	0,00E+00	7,25E-03	3,19E-02	0,00E+00	1,74E+00	-4,59E-02
PENRE	MJ	4,88E+01	0,00E+00	5,14E-01	5,87E-01	0,00E+00	4,99E+01	-2,10E+00
PENRM	MJ	7,55E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,55E+01	0,00E+00
PENRT	MJ	1,24E+02	0,00E+00	5,14E-01	5,87E-01	0,00E+00	1,25E+02	-2,10E+00
SM	Kg	4,43E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,43E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,52E-02	0,00E+00	5,36E-05	3,16E-04	0,00E+00	2,56E-02	-4,31E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;  
**PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material;  
**RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 8 • Output flow and waste.

ASSO MINERALE 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	6,16E-04	0,00E+00	1,34E-06	1,13E-06	0,00E+00	6,18E-04	-1,24E-05
NHWD	kg	5,84E-01	0,00E+00	2,65E-02	7,20E-01	0,00E+00	1,33E+00	-9,37E-02
RWD	kg	7,10E-04	0,00E+00	3,48E-06	3,91E-06	0,00E+00	7,18E-04	-1,34E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,09E+00	0,00E+00	4,09E+00	-4,09E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use;  
**MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.



Table 9 • Environmental performance.

ASSO MINERALE 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,82E+00	0,00E+00	3,81E-02	3,85E-02	0,00E+00	2,90E+00	-1,67E-01
GWP-fossil	kg CO2 eq	2,81E+00	0,00E+00	3,80E-02	3,79E-02	0,00E+00	2,89E+00	-1,66E-01
GWP-biogenic	kg CO2 eq	9,71E-03	0,00E+00	1,01E-04	5,57E-04	0,00E+00	1,04E-02	-5,62E-04
GWP-luluc	kg CO2 eq	1,47E-03	0,00E+00	1,50E-05	2,97E-05	0,00E+00	1,51E-03	-5,60E-04
ODP	kg CFC11 eq	3,59E-06	0,00E+00	8,86E-09	7,75E-09	0,00E+00	3,61E-06	-3,22E-08
AP	mol H+ eq	1,80E-02	0,00E+00	1,92E-04	3,20E-04	0,00E+00	1,85E-02	-1,55E-03
EP-freshwater	kg P eq	4,15E-04	0,00E+00	2,47E-06	1,06E-05	0,00E+00	4,28E-04	-1,87E-05
EP-marine	kg N eq	3,38E-03	0,00E+00	6,63E-05	1,21E-04	0,00E+00	3,56E-03	-4,69E-04
EP-terrestrial	mol N eq	3,75E-02	0,00E+00	7,25E-04	1,31E-03	0,00E+00	3,95E-02	-5,14E-03
POCP	kg NMVOC eq	9,88E-03	0,00E+00	1,77E-04	3,17E-04	0,00E+00	1,04E-02	-1,26E-03
ADP-minerals&metals**	kg Sb eq	1,99E-05	0,00E+00	1,33E-07	1,24E-07	0,00E+00	2,02E-05	-9,74E-07
ADP-fossil**	MJ	1,38E+02	0,00E+00	5,67E-01	5,83E-01	0,00E+00	1,40E+02	-2,31E+00
WDP**	m3 depriv.	6,03E-01	0,00E+00	1,73E-03	1,11E-02	0,00E+00	6,16E-01	-2,05E-01
PM	disease inc.	1,14E-07	0,00E+00	2,74E-09	2,49E-08	0,00E+00	1,41E-07	-1,56E-08
IRP*	kBq U-235 eq	6,20E-01	0,00E+00	2,98E-03	6,43E-03	0,00E+00	6,29E-01	-1,21E-02
ETP-fw**	CTUe	8,84E+01	0,00E+00	4,52E-01	4,45E-01	0,00E+00	8,93E+01	-2,25E+00
HTP-nc**	CTUh	3,52E-08	0,00E+00	4,72E-10	3,65E-10	0,00E+00	3,60E-08	-2,31E-09
HTP-c**	CTUh	1,52E-09	0,00E+00	1,46E-11	1,98E-11	0,00E+00	1,55E-09	-1,28E-10
SQP**	Pt	2,18E+01	0,00E+00	4,12E-01	6,71E-01	0,00E+00	2,29E+01	-4,89E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

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Table 10 • Use of resources.

ASSO MINERALE 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,73E+00	0,00E+00	8,16E-03	3,59E-02	0,00E+00	1,78E+00	-5,17E-02
PERM	MJ	8,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,75E-02	0,00E+00
PERT	MJ	1,82E+00	0,00E+00	8,16E-03	3,59E-02	0,00E+00	1,86E+00	-5,17E-02
PENRE	MJ	5,30E+01	0,00E+00	5,79E-01	6,61E-01	0,00E+00	5,43E+01	-2,37E+00
PENRM	MJ	8,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,86E+01	0,00E+00
PENRT	MJ	1,42E+02	0,00E+00	5,79E-01	6,61E-01	0,00E+00	1,43E+02	-2,37E+00
SM	Kg	4,60E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,60E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,80E-02	0,00E+00	6,04E-05	3,56E-04	0,00E+00	2,84E-02	-4,86E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 11 • Output flow and waste.

ASSO MINERALE 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	6,22E-04	0,00E+00	1,51E-06	1,27E-06	0,00E+00	6,24E-04	-1,40E-05
NHWD	kg	6,15E-01	0,00E+00	2,98E-02	8,10E-01	0,00E+00	1,46E+00	-1,06E-01
RWD	kg	8,23E-04	0,00E+00	3,92E-06	4,41E-06	0,00E+00	8,31E-04	-1,51E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,60E+00	0,00E+00	4,60E+00	-4,60E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 12 • Environmental performance.

GUMMIFLEX 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,48E+00	0,00E+00	2,72E-02	2,74E-02	0,00E+00	2,53E+00	-1,18E-01
GWP-fossil	kg CO2 eq	2,47E+00	0,00E+00	2,71E-02	2,70E-02	0,00E+00	2,53E+00	-1,17E-01
GWP-biogenic	kg CO2 eq	6,42E-03	0,00E+00	7,22E-05	3,97E-04	0,00E+00	6,89E-03	-3,94E-04
GWP-luluc	kg CO2 eq	1,48E-03	0,00E+00	1,07E-05	2,12E-05	0,00E+00	1,51E-03	-3,93E-04
ODP	kg CFC11 eq	3,70E-06	0,00E+00	6,32E-09	5,52E-09	0,00E+00	3,71E-06	-2,26E-08
AP	mol H+ eq	1,53E-02	0,00E+00	1,37E-04	2,28E-04	0,00E+00	1,57E-02	-1,09E-03
EP-freshwater	kg P eq	4,08E-04	0,00E+00	1,76E-06	7,53E-06	0,00E+00	4,17E-04	-1,31E-05
EP-marine	kg N eq	2,74E-03	0,00E+00	4,72E-05	8,64E-05	0,00E+00	2,87E-03	-3,29E-04
EP-terrestrial	mol N eq	3,07E-02	0,00E+00	5,16E-04	9,35E-04	0,00E+00	3,22E-02	-3,61E-03
POCP	kg NMVOC eq	7,96E-03	0,00E+00	1,26E-04	2,26E-04	0,00E+00	8,31E-03	-8,87E-04
ADP-minerals&metals**	kg Sb eq	1,82E-05	0,00E+00	9,50E-08	8,86E-08	0,00E+00	1,84E-05	-6,84E-07
ADP-fossil**	MJ	1,16E+02	0,00E+00	4,04E-01	4,16E-01	0,00E+00	1,17E+02	-1,62E+00
WDP**	m3 depriv.	6,33E-01	0,00E+00	1,24E-03	7,91E-03	0,00E+00	6,42E-01	-1,44E-01
PM	disease inc.	9,39E-08	0,00E+00	1,95E-09	1,77E-08	0,00E+00	1,14E-07	-1,10E-08
IRP*	kBq U-235 eq	5,20E-01	0,00E+00	2,12E-03	4,59E-03	0,00E+00	5,27E-01	-8,49E-03
ETP-fw**	CTUe	7,49E+01	0,00E+00	3,22E-01	3,17E-01	0,00E+00	7,55E+01	-1,58E+00
HTP-nc**	CTUh	2,97E-08	0,00E+00	3,36E-10	2,60E-10	0,00E+00	3,03E-08	-1,62E-09
HTP-c**	CTUh	1,37E-09	0,00E+00	1,04E-11	1,41E-11	0,00E+00	1,40E-09	-9,01E-11
SQP**	Pt	1,72E+01	0,00E+00	2,94E-01	4,78E-01	0,00E+00	1,79E+01	-3,43E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

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Table 13 • Use of resources.

GUMMIFLEX 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,73E+00	0,00E+00	5,82E-03	2,56E-02	0,00E+00	1,76E+00	-3,63E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,81E+00	0,00E+00	5,82E-03	2,56E-02	0,00E+00	1,84E+00	-3,63E-02
PENRE	MJ	4,71E+01	0,00E+00	4,13E-01	4,71E-01	0,00E+00	4,80E+01	-1,66E+00
PENRM	MJ	7,23E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,23E+01	0,00E+00
PENRT	MJ	1,19E+02	0,00E+00	4,13E-01	4,71E-01	0,00E+00	1,20E+02	-1,66E+00
SM	Kg	3,75E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,75E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,64E-02	0,00E+00	4,30E-05	2,54E-04	0,00E+00	2,67E-02	-3,41E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;  
**PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material;  
**RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 14 • Output flow and waste.

GUMMIFLEX 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	7,72E-04	0,00E+00	1,08E-06	9,06E-07	0,00E+00	7,74E-04	-9,79E-06
NHWD	kg	4,34E-01	0,00E+00	2,12E-02	5,78E-01	0,00E+00	1,03E+00	-7,41E-02
RWD	kg	6,63E-04	0,00E+00	2,79E-06	3,14E-06	0,00E+00	6,69E-04	-1,06E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	3,29E+00	0,00E+00	3,29E+00	-3,29E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use;  
**MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 15 • Environmental performance.

ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,77E+00	0,00E+00	3,38E-02	3,41E-02	0,00E+00	2,83E+00	-1,49E-01
GWP-fossil	kg CO2 eq	2,76E+00	0,00E+00	3,37E-02	3,36E-02	0,00E+00	2,82E+00	-1,48E-01
GWP-biogenic	kg CO2 eq	7,17E-03	0,00E+00	8,98E-05	4,94E-04	0,00E+00	7,75E-03	-4,98E-04
GWP-luluc	kg CO2 eq	1,59E-03	0,00E+00	1,33E-05	2,64E-05	0,00E+00	1,63E-03	-4,97E-04
ODP	kg CFC11 eq	3,81E-06	0,00E+00	7,85E-09	6,87E-09	0,00E+00	3,82E-06	-2,86E-08
AP	mol H+ eq	1,69E-02	0,00E+00	1,71E-04	2,84E-04	0,00E+00	1,74E-02	-1,37E-03
EP-freshwater	kg P eq	4,32E-04	0,00E+00	2,19E-06	9,36E-06	0,00E+00	4,43E-04	-1,66E-05
EP-marine	kg N eq	3,23E-03	0,00E+00	5,87E-05	1,07E-04	0,00E+00	3,40E-03	-4,16E-04
EP-terrestrial	mol N eq	3,61E-02	0,00E+00	6,42E-04	1,16E-03	0,00E+00	3,79E-02	-4,57E-03
POCP	kg NMVOC eq	9,29E-03	0,00E+00	1,57E-04	2,81E-04	0,00E+00	9,73E-03	-1,12E-03
ADP-minerals&metals**	kg Sb eq	1,99E-05	0,00E+00	1,18E-07	1,10E-07	0,00E+00	2,01E-05	-8,64E-07
ADP-fossil**	MJ	1,23E+02	0,00E+00	5,02E-01	5,17E-01	0,00E+00	1,24E+02	-2,05E+00
WDP**	m3 depriv.	6,39E-01	0,00E+00	1,54E-03	9,84E-03	0,00E+00	6,50E-01	-1,82E-01
PM	disease inc.	1,14E-07	0,00E+00	2,43E-09	2,21E-08	0,00E+00	1,38E-07	-1,39E-08
IRP*	kBq U-235 eq	5,53E-01	0,00E+00	2,64E-03	5,70E-03	0,00E+00	5,62E-01	-1,07E-02
ETP-fw**	CTUe	8,00E+01	0,00E+00	4,00E-01	3,95E-01	0,00E+00	8,08E+01	-1,99E+00
HTP-nc**	CTUh	3,37E-08	0,00E+00	4,18E-10	3,23E-10	0,00E+00	3,44E-08	-2,05E-09
HTP-c**	CTUh	1,51E-09	0,00E+00	1,30E-11	1,76E-11	0,00E+00	1,54E-09	-1,14E-10
SQP**	Pt	2,03E+01	0,00E+00	3,65E-01	5,95E-01	0,00E+00	2,12E+01	-4,34E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

**\*Disclaimer** – 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.

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Table 16 • Use of resources.

ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,81E+00	0,00E+00	7,23E-03	3,18E-02	0,00E+00	1,85E+00	-4,59E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,89E+00	0,00E+00	7,23E-03	3,18E-02	0,00E+00	1,93E+00	-4,59E-02
PENRE	MJ	5,17E+01	0,00E+00	5,13E-01	5,86E-01	0,00E+00	5,28E+01	-2,10E+00
PENRM	MJ	7,47E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,47E+01	0,00E+00
PENRT	MJ	1,26E+02	0,00E+00	5,13E-01	5,86E-01	0,00E+00	1,28E+02	-2,10E+00
SM	Kg	3,88E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,88E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,70E-02	0,00E+00	5,35E-05	3,15E-04	0,00E+00	2,74E-02	-4,32E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 17 • Output flow and waste.

ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	7,83E-04	0,00E+00	1,34E-06	1,13E-06	0,00E+00	7,86E-04	-1,24E-05
NHWD	kg	6,28E-01	0,00E+00	2,64E-02	7,18E-01	0,00E+00	1,37E+00	-9,37E-02
RWD	kg	7,09E-04	0,00E+00	3,47E-06	3,91E-06	0,00E+00	7,16E-04	-1,34E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,09E+00	0,00E+00	4,09E+00	-4,09E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 18 • Environmental performance.

ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,98E+00	0,00E+00	3,80E-02	3,84E-02	0,00E+00	3,06E+00	-1,67E-01
GWP-fossil	kg CO2 eq	2,97E+00	0,00E+00	3,79E-02	3,78E-02	0,00E+00	3,04E+00	-1,66E-01
GWP-biogenic	kg CO2 eq	8,25E-03	0,00E+00	1,01E-04	5,56E-04	0,00E+00	8,90E-03	-5,62E-04
GWP-luluc	kg CO2 eq	1,67E-03	0,00E+00	1,50E-05	2,97E-05	0,00E+00	1,72E-03	-5,60E-04
ODP	kg CFC11 eq	4,07E-06	0,00E+00	8,84E-09	7,73E-09	0,00E+00	4,09E-06	-3,22E-08
AP	mol H+ eq	1,88E-02	0,00E+00	1,92E-04	3,20E-04	0,00E+00	1,93E-02	-1,55E-03
EP-freshwater	kg P eq	4,59E-04	0,00E+00	2,46E-06	1,05E-05	0,00E+00	4,72E-04	-1,87E-05
EP-marine	kg N eq	3,54E-03	0,00E+00	6,61E-05	1,21E-04	0,00E+00	3,73E-03	-4,69E-04
EP-terrestrial	mol N eq	3,95E-02	0,00E+00	7,23E-04	1,31E-03	0,00E+00	4,15E-02	-5,15E-03
POCP	kg NMVOC eq	1,03E-02	0,00E+00	1,76E-04	3,17E-04	0,00E+00	1,08E-02	-1,26E-03
ADP-minerals&metals**	kg Sb eq	2,16E-05	0,00E+00	1,33E-07	1,24E-07	0,00E+00	2,19E-05	-9,74E-07
ADP-fossil**	MJ	1,40E+02	0,00E+00	5,66E-01	5,82E-01	0,00E+00	1,41E+02	-2,31E+00
WDP**	m3 depriv.	6,78E-01	0,00E+00	1,73E-03	1,11E-02	0,00E+00	6,91E-01	-2,05E-01
PM	disease inc.	1,22E-07	0,00E+00	2,73E-09	2,48E-08	0,00E+00	1,50E-07	-1,57E-08
IRP*	kBq U-235 eq	6,28E-01	0,00E+00	2,97E-03	6,42E-03	0,00E+00	6,37E-01	-1,21E-02
ETP-fw**	CTUe	9,07E+01	0,00E+00	4,51E-01	4,44E-01	0,00E+00	9,16E+01	-2,25E+00
HTP-nc**	CTUh	3,71E-08	0,00E+00	4,71E-10	3,64E-10	0,00E+00	3,79E-08	-2,31E-09
HTP-c**	CTUh	1,64E-09	0,00E+00	1,46E-11	1,98E-11	0,00E+00	1,68E-09	-1,28E-10
SQP**	Pt	2,25E+01	0,00E+00	4,11E-01	6,70E-01	0,00E+00	2,36E+01	-4,89E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

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Table 19 • Use of resources.

ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,93E+00	0,00E+00	8,15E-03	3,58E-02	0,00E+00	1,97E+00	-5,17E-02
PERM	MJ	8,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,75E-02	0,00E+00
PERT	MJ	2,01E+00	0,00E+00	8,15E-03	3,58E-02	0,00E+00	2,06E+00	-5,17E-02
PENRE	MJ	5,59E+01	0,00E+00	5,78E-01	6,60E-01	0,00E+00	5,72E+01	-2,37E+00
PENRM	MJ	8,78E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,78E+01	0,00E+00
PENRT	MJ	1,44E+02	0,00E+00	5,78E-01	6,60E-01	0,00E+00	1,45E+02	-2,37E+00
SM	Kg	4,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,56E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,98E-02	0,00E+00	6,02E-05	3,55E-04	0,00E+00	3,02E-02	-4,86E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;  
**PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material;  
**RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 20 • Output flow and waste.

ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	7,89E-04	0,00E+00	1,51E-06	1,27E-06	0,00E+00	7,92E-04	-1,40E-05
NHWD	kg	6,59E-01	0,00E+00	2,97E-02	8,09E-01	0,00E+00	1,50E+00	-1,06E-01
RWD	kg	8,21E-04	0,00E+00	3,91E-06	4,40E-06	0,00E+00	8,30E-04	-1,51E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,60E+00	0,00E+00	4,60E+00	-4,60E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use;  
**MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 21 • Environmental performance.

GUMMIVAL 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	1,86E+00	0,00E+00	2,71E-02	2,73E-02	0,00E+00	1,91E+00	-1,16E-01
GWP-fossil	kg CO2 eq	2,54E+00	0,00E+00	2,70E-02	2,69E-02	0,00E+00	2,59E+00	-1,15E-01
GWP-biogenic	kg CO2 eq	5,34E-03	0,00E+00	7,20E-05	3,96E-04	0,00E+00	5,81E-03	-3,88E-04
GWP-luluc	kg CO2 eq	1,59E-03	0,00E+00	1,07E-05	2,11E-05	0,00E+00	1,63E-03	-3,87E-04
ODP	kg CFC11 eq	3,96E-06	0,00E+00	6,30E-09	5,51E-09	0,00E+00	3,98E-06	-2,22E-08
AP	mol H+ eq	1,57E-02	0,00E+00	1,37E-04	2,28E-04	0,00E+00	1,61E-02	-1,07E-03
EP-freshwater	kg P eq	4,30E-04	0,00E+00	1,75E-06	7,51E-06	0,00E+00	4,39E-04	-1,29E-05
EP-marine	kg N eq	2,83E-03	0,00E+00	4,71E-05	8,61E-05	0,00E+00	2,96E-03	-3,24E-04
EP-terrestrial	mol N eq	3,18E-02	0,00E+00	5,15E-04	9,32E-04	0,00E+00	3,33E-02	-3,55E-03
POCP	kg NMVOC eq	8,16E-03	0,00E+00	1,26E-04	2,26E-04	0,00E+00	8,51E-03	-8,73E-04
ADP-minerals&metals**	kg Sb eq	1,92E-05	0,00E+00	9,46E-08	8,83E-08	0,00E+00	1,93E-05	-6,73E-07
ADP-fossil**	MJ	1,17E+02	0,00E+00	4,03E-01	4,14E-01	0,00E+00	1,17E+02	-1,60E+00
WDP**	m3 depriv.	6,72E-01	0,00E+00	1,23E-03	7,89E-03	0,00E+00	6,81E-01	-1,41E-01
PM	disease inc.	9,91E-08	0,00E+00	1,94E-09	1,77E-08	0,00E+00	1,19E-07	-1,08E-08
IRP*	kBq U-235 eq	5,21E-01	0,00E+00	2,11E-03	4,57E-03	0,00E+00	5,27E-01	-8,35E-03
ETP-fw**	CTUe	7,59E+01	0,00E+00	3,21E-01	3,16E-01	0,00E+00	7,66E+01	-1,55E+00
HTP-nc**	CTUh	3,08E-08	0,00E+00	3,35E-10	2,59E-10	0,00E+00	3,14E-08	-1,60E-09
HTP-c**	CTUh	1,44E-09	0,00E+00	1,04E-11	1,41E-11	0,00E+00	1,46E-09	-8,87E-11
SQP**	Pt	1,76E+01	0,00E+00	2,93E-01	4,77E-01	0,00E+00	1,84E+01	-3,38E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

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Table 22 • Use of resources.

GUMMIVAL 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,83E+00	0,00E+00	5,80E-03	2,55E-02	0,00E+00	1,86E+00	-3,57E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,91E+00	0,00E+00	5,80E-03	2,55E-02	0,00E+00	1,94E+00	-3,57E-02
PENRE	MJ	4,83E+01	0,00E+00	4,11E-01	4,70E-01	0,00E+00	4,92E+01	-1,64E+00
PENRM	MJ	7,15E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,15E+01	0,00E+00
PENRT	MJ	1,20E+02	0,00E+00	4,11E-01	4,70E-01	0,00E+00	1,21E+02	-1,64E+00
SM	Kg	4,96E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,96E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,73E-02	0,00E+00	4,29E-05	2,53E-04	0,00E+00	2,76E-02	-3,36E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 23 • Output flow and waste.

GUMMIVAL 3 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	8,67E-04	0,00E+00	1,07E-06	9,03E-07	0,00E+00	8,69E-04	-9,64E-06
NHWD	kg	4,65E-01	0,00E+00	2,12E-02	5,76E-01	0,00E+00	1,06E+00	-7,29E-02
RWD	kg	6,59E-04	0,00E+00	2,78E-06	3,13E-06	0,00E+00	6,65E-04	-1,04E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	3,28E+00	0,00E+00	3,28E+00	-3,28E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 24 • Environmental performance.

GUMMIVAL 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,31E+00	0,00E+00	3,57E-02	3,60E-02	0,00E+00	2,38E+00	-1,54E-01
GWP-fossil	kg CO2 eq	2,99E+00	0,00E+00	3,55E-02	3,55E-02	0,00E+00	3,06E+00	-1,53E-01
GWP-biogenic	kg CO2 eq	7,74E-03	0,00E+00	9,48E-05	5,21E-04	0,00E+00	8,36E-03	-5,17E-04
GWP-luluc	kg CO2 eq	1,77E-03	0,00E+00	1,41E-05	2,78E-05	0,00E+00	1,81E-03	-5,16E-04
ODP	kg CFC11 eq	4,50E-06	0,00E+00	8,29E-09	7,25E-09	0,00E+00	4,52E-06	-2,97E-08
AP	mol H+ eq	1,95E-02	0,00E+00	1,80E-04	3,00E-04	0,00E+00	1,99E-02	-1,43E-03
EP-freshwater	kg P eq	4,88E-04	0,00E+00	2,31E-06	9,89E-06	0,00E+00	5,00E-04	-1,72E-05
EP-marine	kg N eq	3,46E-03	0,00E+00	6,20E-05	1,13E-04	0,00E+00	3,64E-03	-4,32E-04
EP-terrestrial	mol N eq	3,87E-02	0,00E+00	6,78E-04	1,23E-03	0,00E+00	4,06E-02	-4,74E-03
POCP	kg NMVOC eq	1,01E-02	0,00E+00	1,65E-04	2,97E-04	0,00E+00	1,06E-02	-1,16E-03
ADP-minerals&metals**	kg Sb eq	2,28E-05	0,00E+00	1,25E-07	1,16E-07	0,00E+00	2,30E-05	-8,97E-07
ADP-fossil**	MJ	1,52E+02	0,00E+00	5,31E-01	5,46E-01	0,00E+00	1,53E+02	-2,13E+00
WDP**	m3 depriv.	7,54E-01	0,00E+00	1,62E-03	1,04E-02	0,00E+00	7,66E-01	-1,88E-01
PM	disease inc.	1,17E-07	0,00E+00	2,56E-09	2,33E-08	0,00E+00	1,43E-07	-1,44E-08
IRP*	kBq U-235 eq	6,74E-01	0,00E+00	2,79E-03	6,02E-03	0,00E+00	6,82E-01	-1,11E-02
ETP-fw**	CTUe	9,77E+01	0,00E+00	4,23E-01	4,17E-01	0,00E+00	9,85E+01	-2,07E+00
HTP-nc**	CTUh	3,77E-08	0,00E+00	4,42E-10	3,41E-10	0,00E+00	3,85E-08	-2,13E-09
HTP-c**	CTUh	1,71E-09	0,00E+00	1,37E-11	1,86E-11	0,00E+00	1,74E-09	-1,18E-10
SQP**	Pt	2,22E+01	0,00E+00	3,86E-01	6,28E-01	0,00E+00	2,32E+01	-4,51E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

\***Disclaimer** – 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.

\*\***Disclaimer** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experiences with the indicator.



Table 25 • Use of resources.

GUMMIVAL 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	2,06E+00	0,00E+00	7,64E-03	3,36E-02	0,00E+00	2,10E+00	-4,76E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	2,14E+00	0,00E+00	7,64E-03	3,36E-02	0,00E+00	2,18E+00	-4,76E-02
PENRE	MJ	5,72E+01	0,00E+00	5,42E-01	6,19E-01	0,00E+00	5,84E+01	-2,18E+00
PENRM	MJ	9,78E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,78E+01	0,00E+00
PENRT	MJ	1,55E+02	0,00E+00	5,42E-01	6,19E-01	0,00E+00	1,56E+02	-2,18E+00
SM	Kg	6,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,32E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	3,26E-02	0,00E+00	5,65E-05	3,33E-04	0,00E+00	3,30E-02	-4,48E-03

**PERE** = Uso di energia primaria rinnovabile, escluse le risorse energetiche primarie rinnovabili usate come materie prime; **PERM** = Uso di risorse energetiche rinnovabili come materie prime; **PERT** = Uso totale delle risorse energetiche primarie rinnovabili; **PENRE** = Uso delle risorse energetiche primarie non rinnovabili, escluse le risorse energetiche primarie non rinnovabili usate come materie prime; **PENRM** = Uso di risorse energetiche primarie non rinnovabili come materie prime; **PENRT** = Uso totale delle risorse energetiche primarie non rinnovabili; **SM** = Uso di materie secondarie; **RSF** = Uso di combustibili secondari rinnovabili; **NRSF** = Uso di combustibili secondari non rinnovabili; **FW** = Uso dell'acqua dolce.

Table 26 • Output flow and waste.

GUMMIVAL 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	8,80E-04	0,00E+00	1,42E-06	1,19E-06	0,00E+00	8,83E-04	-1,29E-05
NHWD	kg	5,27E-01	0,00E+00	2,79E-02	7,58E-01	0,00E+00	1,31E+00	-9,72E-02
RWD	kg	8,86E-04	0,00E+00	3,66E-06	4,12E-06	0,00E+00	8,94E-04	-1,39E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,31E+00	0,00E+00	4,31E+00	-4,31E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 27 • Environmental performance.

GUMMIVAL ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	1,98E+00	0,00E+00	3,38E-02	3,41E-02	0,00E+00	2,05E+00	-1,47E-01
GWP-fossil	kg CO2 eq	2,66E+00	0,00E+00	3,37E-02	3,36E-02	0,00E+00	2,73E+00	-1,46E-01
GWP-biogenic	kg CO2 eq	5,84E-03	0,00E+00	8,98E-05	4,93E-04	0,00E+00	6,42E-03	-4,95E-04
GWP-luluc	kg CO2 eq	1,63E-03	0,00E+00	1,33E-05	2,64E-05	0,00E+00	1,67E-03	-4,93E-04
ODP	kg CFC11 eq	4,04E-06	0,00E+00	7,85E-09	6,87E-09	0,00E+00	4,05E-06	-2,84E-08
AP	mol H+ eq	1,65E-02	0,00E+00	1,71E-04	2,84E-04	0,00E+00	1,69E-02	-1,36E-03
EP-freshwater	kg P eq	4,45E-04	0,00E+00	2,19E-06	9,36E-06	0,00E+00	4,56E-04	-1,65E-05
EP-marine	kg N eq	3,00E-03	0,00E+00	5,87E-05	1,07E-04	0,00E+00	3,17E-03	-4,13E-04
EP-terrestrial	mol N eq	3,37E-02	0,00E+00	6,42E-04	1,16E-03	0,00E+00	3,55E-02	-4,53E-03
POCP	kg NMVOC eq	8,65E-03	0,00E+00	1,57E-04	2,81E-04	0,00E+00	9,09E-03	-1,11E-03
ADP-minerals&metals**	kg Sb eq	2,02E-05	0,00E+00	1,18E-07	1,10E-07	0,00E+00	2,04E-05	-8,57E-07
ADP-fossil**	MJ	1,22E+02	0,00E+00	5,02E-01	5,17E-01	0,00E+00	1,23E+02	-2,04E+00
WDP**	m3 depriv.	6,73E-01	0,00E+00	1,54E-03	9,84E-03	0,00E+00	6,84E-01	-1,80E-01
PM	disease inc.	1,05E-07	0,00E+00	2,42E-09	2,21E-08	0,00E+00	1,30E-07	-1,38E-08
IRP*	kBq U-235 eq	5,43E-01	0,00E+00	2,64E-03	5,70E-03	0,00E+00	5,52E-01	-1,06E-02
ETP-fw**	CTUe	7,91E+01	0,00E+00	4,00E-01	3,95E-01	0,00E+00	7,99E+01	-1,98E+00
HTP-nc**	CTUh	3,25E-08	0,00E+00	4,18E-10	3,23E-10	0,00E+00	3,32E-08	-2,04E-09
HTP-c**	CTUh	1,51E-09	0,00E+00	1,30E-11	1,76E-11	0,00E+00	1,54E-09	-1,13E-10
SQP**	Pt	1,87E+01	0,00E+00	3,65E-01	5,95E-01	0,00E+00	1,97E+01	-4,31E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

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**\*\*Disclaimer** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experiences with the indicator.

Table 28 • Use of resources.

GUMMIVAL ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,89E+00	0,00E+00	7,23E-03	3,18E-02	0,00E+00	1,92E+00	-4,56E-02
PERM	MJ	7,88E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,88E-02	0,00E+00
PERT	MJ	1,96E+00	0,00E+00	7,23E-03	3,18E-02	0,00E+00	2,00E+00	-4,56E-02
PENRE	MJ	5,05E+01	0,00E+00	5,13E-01	5,86E-01	0,00E+00	5,16E+01	-2,09E+00
PENRM	MJ	7,42E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,42E+01	0,00E+00
PENRT	MJ	1,25E+02	0,00E+00	5,13E-01	5,86E-01	0,00E+00	1,26E+02	-2,09E+00
SM	Kg	5,11E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,11E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,77E-02	0,00E+00	5,35E-05	3,15E-04	0,00E+00	2,81E-02	-4,28E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 29 • Output flow and waste.

GUMMIVAL ARDESIA 4 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	8,71E-04	0,00E+00	1,34E-06	1,13E-06	0,00E+00	8,74E-04	-1,23E-05
NHWD	kg	5,09E-01	0,00E+00	2,64E-02	7,18E-01	0,00E+00	1,25E+00	-9,30E-02
RWD	kg	6,89E-04	0,00E+00	3,47E-06	3,90E-06	0,00E+00	6,96E-04	-1,33E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,09E+00	0,00E+00	4,09E+00	-4,09E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use; **MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

Table 30 • Environmental performance.

GUMMIVAL ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
GWP - Total	kg CO2 eq	2,20E+00	0,00E+00	3,80E-02	3,84E-02	0,00E+00	2,28E+00	-1,66E-01
GWP-fossil	kg CO2 eq	2,88E+00	0,00E+00	3,79E-02	3,78E-02	0,00E+00	2,96E+00	-1,65E-01
GWP-biogenic	kg CO2 eq	6,97E-03	0,00E+00	1,01E-04	5,56E-04	0,00E+00	7,63E-03	-5,58E-04
GWP-luluc	kg CO2 eq	1,72E-03	0,00E+00	1,50E-05	2,97E-05	0,00E+00	1,77E-03	-5,57E-04
ODP	kg CFC11 eq	4,30E-06	0,00E+00	8,84E-09	7,73E-09	0,00E+00	4,32E-06	-3,20E-08
AP	mol H+ eq	1,83E-02	0,00E+00	1,92E-04	3,20E-04	0,00E+00	1,88E-02	-1,54E-03
EP-freshwater	kg P eq	4,73E-04	0,00E+00	2,46E-06	1,05E-05	0,00E+00	4,86E-04	-1,86E-05
EP-marine	kg N eq	3,31E-03	0,00E+00	6,61E-05	1,21E-04	0,00E+00	3,50E-03	-4,66E-04
EP-terrestrial	mol N eq	3,71E-02	0,00E+00	7,23E-04	1,31E-03	0,00E+00	3,91E-02	-5,11E-03
POCP	kg NMVOC eq	9,63E-03	0,00E+00	1,76E-04	3,17E-04	0,00E+00	1,01E-02	-1,26E-03
ADP-minerals&metals**	kg Sb eq	2,19E-05	0,00E+00	1,33E-07	1,24E-07	0,00E+00	2,22E-05	-9,68E-07
ADP-fossil**	MJ	1,39E+02	0,00E+00	5,66E-01	5,82E-01	0,00E+00	1,40E+02	-2,30E+00
WDP**	m3 depriv.	7,13E-01	0,00E+00	1,73E-03	1,11E-02	0,00E+00	7,25E-01	-2,03E-01
PM	disease inc.	1,14E-07	0,00E+00	2,73E-09	2,48E-08	0,00E+00	1,42E-07	-1,56E-08
IRP*	kBq U-235 eq	6,19E-01	0,00E+00	2,97E-03	6,42E-03	0,00E+00	6,28E-01	-1,20E-02
ETP-fw**	CTUe	8,99E+01	0,00E+00	4,51E-01	4,44E-01	0,00E+00	9,08E+01	-2,23E+00
HTP-nc**	CTUh	3,59E-08	0,00E+00	4,71E-10	3,64E-10	0,00E+00	3,67E-08	-2,30E-09
HTP-c**	CTUh	1,64E-09	0,00E+00	1,46E-11	1,98E-11	0,00E+00	1,68E-09	-1,28E-10
SQP**	Pt	2,10E+01	0,00E+00	4,11E-01	6,69E-01	0,00E+00	2,20E+01	-4,86E+00

**GWP-total** = Climate change; **GWP-fossil** = Climate change - fossil; **GWP-biogenic** = Climate change - biogenic; **GWP-luluc** = Climate change - land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water deprivation potential; **PM** = Particulate matter; **IRP** = Ionising radiation; **ETP-fw** = Ecotoxicity freshwater; **HTP-nc** = Human toxicity non cancer; **HTP-c** = Human toxicity cancer; **SQP** = Land use.

**\*Disclaimer** – 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.

**\*\*Disclaimer** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experiences with the indicator.

Table 31 • Use of resources.

GUMMIVAL ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
PERE	MJ	2,00E+00	0,00E+00	8,15E-03	3,58E-02	0,00E+00	2,04E+00	-5,14E-02
PERM	MJ	8,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,75E-02	0,00E+00
PERT	MJ	2,09E+00	0,00E+00	8,15E-03	3,58E-02	0,00E+00	2,13E+00	-5,14E-02
PENRE	MJ	5,49E+01	0,00E+00	5,78E-01	6,60E-01	0,00E+00	5,61E+01	-2,36E+00
PENRM	MJ	8,73E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,73E+01	0,00E+00
PENRT	MJ	1,42E+02	0,00E+00	5,78E-01	6,60E-01	0,00E+00	1,43E+02	-2,36E+00
SM	Kg	5,79E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,79E-01	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	3,05E-02	0,00E+00	6,02E-05	3,55E-04	0,00E+00	3,09E-02	-4,83E-03

**PERE** = Use of renewable primary energy excluding renewable primary energy resources used as raw materials;  
**PERM** = Use of renewable primary energy resources used as raw materials; **PERT** = Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM** = Use of non-renewable primary energy resources used as raw materials; **PENRT** = Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM** = Use of secondary material;  
**RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of fresh water.

Table 32 • Output flow and waste.

GUMMIVAL ARDESIA 4,5 PL CLASSIC								
Parameters	Unit	A1-A3	C1	C2	C3	C4	Total	D
HWD	kg	8,78E-04	0,00E+00	1,51E-06	1,27E-06	0,00E+00	8,80E-04	-1,39E-05
NHWD	kg	5,40E-01	0,00E+00	2,97E-02	8,09E-01	0,00E+00	1,38E+00	-1,05E-01
RWD	kg	8,01E-04	0,00E+00	3,91E-06	4,40E-06	0,00E+00	8,10E-04	-1,50E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	4,60E+00	0,00E+00	4,60E+00	-4,60E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**HWD** = Hazardous waste disposed; **NHWD** = Non-Hazardous waste disposed; **RWD** = Radioactive waste disposed; **CRU** = Components for re-use;  
**MFR** = Materials for recycling; **MER** = Materials for energy recovery; **EEE** = Exported energy electricity; **EET** = Exported energy thermal.

### 3.1 - DATA QUALITY

The data used for the environmental impact assessment of the phases are:

- Specific (primary) data, collected and referred to production of the reference year;
- Generic (secondary) data used in modeling LCA.

## 4 ADDITIONAL ENVIRONMENTAL INFORMATION

Table 33 • Information on biogenic carbon.

INDICATOR	UNIT	QUANTITY
<b>ASSO 4 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63E-03
<b>ASSO MINERALE 4 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63E-03
<b>ASSO MINERALE 4,5 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,81E-03
<b>GUMMIFLEX 3 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63E-03
<b>ARDESIA 4 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63E-03
<b>ARDESIA 4,5 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,81-03
<b>GUMMIVAL 3 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63-03
<b>GUMMIVAL 4 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63-03
<b>GUMMIVAL ARDESIA 4 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,63-03
<b>GUMMIVAL ARDESIA 4,5 PL CLASSIC</b>		
Biogenic carbon content in product	Kg C/declared unit	0
Biogenic Carbon Content in packaging	Kg C/declared unit	1,81-03

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

Table 34 shows the content of recycled, by-product and recovered material according to iso 14021:2016 standard and cam requirements.

Table 34 • Minimum content of recycled material by product material and recovered material.

MINIMUM CONTENT OF RECYCLED, RECOVERED, BY-PRODUCT MATERIALS						
PRODUCT NAME <sup>1)</sup>	RECYCLED MATERIAL			RECOVERED MATERIAL	BY-PRODUCT MATERIAL	TOTAL CONTENT OF RECYCLED, RECOVERED, BY-PRODUCT MATERIAL <sup>2)</sup>
	Total [%]	Total [%]	Total [%]	[%]	[%]	[%]
ASSO 4 PL CLASSIC	12	6	6	n.p.d.	n.p.d.	12
ASSO MINERALE 4 PL CLASSIC	10	5	5	n.p.d.	n.p.d.	10
ASSO MINERALE 4,5 PL CLASSIC	10	5	5	n.p.d.	n.p.d.	10
GUMMIFLEX 3 PL CLASSIC	11	5	6	n.p.d.	n.p.d.	11
ARDESIA 4 PL CLASSIC	10	5	5	n.p.d.	n.p.d.	10
ARDESIA 4,5 PL CLASSIC	10	5	5	n.p.d.	n.p.d.	10
GUMMIVAL 3 PL CLASSIC	15	5	10	n.p.d.	n.p.d.	15
GUMMIVAL 4 PL CLASSIC	15	6	9	n.p.d.	n.p.d.	15
GUMMIVAL ARDESIA 4 PL CLASSIC	12	4	4	n.p.d.	n.p.d.	12
GUMMIVAL ARDESIA 4,5 PL CLASSIC	13	5	8	n.p.d.	n.p.d.	13

**Legend:**  
n.p.d.: no performance determined

**Notes:**  
<sup>1)</sup>All products of any size or color  
<sup>2)</sup>The value of the minimum total recycled, recovered, by-product content does not imply that all of the three fractions are present in the product. This value may not correspond to the sum of the minimum value of each fraction.

**Unit:** Via del Bosco, 27, 60010 Trecastelli (AN).

**Method used to determine the content of recycled, recovered, by-product materials:** Regulations CP DOC 262.

**Reference period of the used data:** 01/01/2022 – 31/12/2022.

## 5 REFERENCES

### REGULATIONS OF THE EPDItaly PROGRAM 5.2

**PCR construction products:** ICMQ-001/15- rev3 of 02/12/2019

**UNI EN 15804:2019** - Sustainability of construction works - environmental product declarations  
- core rules for the product category of construction products.

**UNI EN ISO 14025:2010** - Environmental labels and declarations - type III environmental declarations  
- principles and procedures.

**UNI EN ISO 14040:2021** - Environmental management - Life cycle assessment  
- Principles and framework.

**UNI EN ISO 14044:2021** - Environmental Management - Life Cycle Assessment  
- Requirements And Guidelines.

**SAFETY DATA SHEET** - (Art. 32 del Reg. 1907/2006/CE, 05/05/2015).

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Valli Zabban technical report, 04/04/2023.

## NOTES

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# Valli Zabban

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