Environmental Product Declaration

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

PRIMARY PROFILES
SECONDARY PROFILES
CREAL PROFILES

from

INDINVEST LT Srl

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-06184
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General Information

Programme Information

EPD Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN EN 15804 standard is used as Core Product Category Rules (PCR)
Product category rules (PCR): *PCR 2019:14 - VERSION 1.11 - CONSTRUCTION PRODUCTS* CPC code: *41532 "Bars, rods and profiles, of aluminium"*
PCR Review Conducted by: *Claudia A. Pena* Organisation: *Technical Committee of the International EPD® System. The list of members can be found at www.environdec.com. The review panel can be contacted via email: info@environdec.com*
Independent third-party declaration and data auditing, under ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third-party auditing: *DNV Business Assurance Italy S.r.l.* Certified by: ACCREDIA Approved by: The International EPD® System
The procedure for data follow-up during the EPD validity involves the third-party auditor: ☒ Yes ☐ No

The EPD owner legally owns and is responsible for the declaration.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information on comparability, see EN 15804 and ISO 14025

Company information

EPD Owner: INDINVEST LT Srl

Contact person: Eng. Alessandro Acquas

Company description:
INDINVEST LT is a leading player in the production and extrusion of aluminium profiles. Its proven track-record stretches back more than 40 years. Its evolving experience and knowledge are underpinned by solid values, such as innovation, quality, service and reliability, which apply to every Research & Development process that goes into our products and systems for industry and architecture.
Based in Cisterna di Latina, about 60 km from Rome, Indinvest LT has an integrated billet foundry with a production capacity of 60,000 tonnes per year. Six extrusion lines with an annual production capacity of 60,000 tonnes can meet market requirements from a 280,000-square-meter site.
The company strengthened its presence in the foreign market. About half of INDINVEST LT's production is destined for the European market.
With its integrated foundry, which is crucial for customised alloys, INDINVEST LT guarantees continuous availability of raw material and the right balance in extrusion between the alloy and the mechanical and surface features of the profiles required by customers.
The advantages of being aluminium profile extruders and raw material producers can be seen in the continuous exchange of knowledge between the extrusion and foundry departments' technicians, who work together to improve the final product. The foundry uses the latest energy-saving technologies. Working alongside top research institutes, INDINVEST LT has made significant progress in recycling pre- and post-consumer aluminium scrap, succeeding in producing high-quality secondary aluminium alloys, particularly the CREAL® alloy which contains more than 85 per cent of recycled material.
The company has a 5" 1100-ton press specifically to produce microprofiles, two 7" 1800- and 2200-ton presses, two 8.5" 2500- and 2800-ton presses and a 10" 3500-ton press. With its systems it can extrude profiles with weights up to 22 kg/m, and lengths up to 14 metres and achieve mechanical features that meet the requirements of various sectors, including commercial and automotive industry profiles.

Certifications:
LT has been UNI EN ISO 9001:2018 certified since 1997; UNI EN ISO 14001:2015 since 2007; UNI EN ISO 50001:2018 since 2021.

Name and location of production site:
INDINVEST LT is headquartered and operational at its plant in Cisterna di Latina LT

Product information

Product name:

EXTRUDED SECONDARY PROFILES

- 6005 Profiles
- 6005A Profiles
- 6060 Profiles
- 6063 Profiles
- 6063A Profiles
- 6082 Profiles

CREAL EXTRUDED SECONDARY PROFILES

- 6060 CREAL Profiles

EXTRUDED PRIMARY PROFILES

- 6060 Primary Profiles
- 6463 Primary Profiles
- 6101 Primary Profiles
- 6101B Primary Profiles
- 99.7 Primary Profiles

Product identification:
Profiles composed of Aluminium alloys of the 6XXX series, with different recycled content.

Product Description:
This EPD covers all INDINVEST LT aluminium extruded profiles produced using primary billets from foreign manufacturers, internally produced secondary billets with a minimum 75 per cent recycled aluminium content and **CREAL®** billets with a minimum 85 per cent recycled aluminium content. The process to define the **CREAL®** billet minimum aluminium content from which the profiles derive is fully traceable and certified by an independent third-party organisation (REF. Validation C087 of 23/12/2021 - IGQ Istituto Italiano di Garanzia della Qualità (Italian Quality Assurance Institute).
The profiles are intended for industrial sectors, including automotive, mechanical engineering, thermal engineering, transport, architectural profiles, furniture, lighting design, nautical and sports sectors.

UN CPC Code:
41532 "Aluminium bars, rods and profiles."

Technical data
The aluminium extruded profiles comply with standards UNI EN 573, UNI EN 755, UNI EN 12020 and we certify products for building structure applications under UNI EN 15088.

LCA information

Declared unit:
1 kg profile

Reference service life:
Not applicable

Time scales:
2020

Database and LCA software used:
SimaPro v. 9.3.0.3; Ecoinvent 3.8.

System boundaries:
Cradle to gate with options (A1–A3 + A4 + C + D)

Additional company and product information:
www.indinvestlt.it

Company that conducted the LCA:
Demetra Soc. Coop. ONLUS (non-profit organisation)

Data quality
In this LCA study, primary data is used for the quantities of materials and energy used for all processes for which INDINVEST LT has control: raw materials, auxiliaries and packaging; energy (electrical and thermal) and water consumption. Specific data is used for: incoming transport of materials and internal consumption; transport of internally produced waste and disposal processes; air emissions; water discharges; transport to customers.
Ecoinvent 3.8. database entries are used to model processes such as the extraction and processing of raw materials to produce basic materials, for energy production and those processes where specific data could not be acquired. The supplier's energy was used to define electricity consumption.
Average Italian and European scenarios were used for packaging waste management. Tertiary data on average scenarios were used in modules C1-C4.

Cut off
Module A5 is excluded, as there is no single reference sector for the installation of profiles, as these are semi-finished products. Among the end of life modules (modules C1-C4), module C3 was excluded. C3 includes waste processes before it goes to reuse-recovery-recycling. Waste is not processed before it reaches End of Waste status and, under the Polluters pay principle, recycling processes are not included in the study.

Allocation
An allocation on the unit of mass is made. Raw materials and their transport are specific for the alloy types. For data for which the quantity per alloy type is unknown, the allocation is made by dividing the totals by the total kg of profiles produced.

Reported modules, geographical scope, data variation:

	Production			Manufacturing processes		Use phase							End of life				Resource recovery
	Raw material supply	Transport	Production	Transport	Building installation	Use	Maintenance	Repair	Replacement	Renovation	Operational energy consumption	Operational water consumption	Dismantling - demolition	Transport	Waste processes	Disposal	Potential Reuse-Recovery-Recycling-
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Reported modules	X	X	X	X	NA	NA	NA	NA	NA	NA	NA	NA	X	X	X	X	X
Geographical boundaries	EU	EU	EU	EU	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	-
Specific data used	>90%			-		-	-	-	-	-	-	-	-	-	-	-	-
SECONDARY PROFILE Variations	+23% / -15%[1]			-		-	-	-	-	-	-	-	-	-	-	-	-
CREAL PROFILE Variation	Not relevant			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation PRIMARY PROFILES	+2% / -2%[2]			-		-	-	-	-	-	-	-	-	-	-	-	-

A1: Raw material supply

This phase considers the raw materials (billets) that are extruded and the energy consumption required for profile production. Secondary and CREAL billets are produced in-house, while primary billets are purchased. All PRE-consumer scrap was treated as waste and is free of environmental burdens.

A2: Transport

This phase considers the incoming transport of raw materials, packaging and auxiliaries to the production process and internal handling.

A3: Production

This phase considers the production of packaging materials and process auxiliaries, water consumption and the waste generated in terms of waste, emissions and discharges.

[1] Result variations between different secondary profile alloys
[2] Result variations between different primary profile alloys

A4: Transport

Transport to customers and the management (disposal, recovery) of waste generated by the packaging were considered.

C1: Dismantling - demolition

At this stage, the energy consumption for dismantling a generic structure is considered. This was assumed to be 0.239 MJ/kg, as specified in the JRC Model for Life Cycle Assessment (LCA) of buildings study.

C2: Transport

The transport of waste to recycling or disposal sites, assumed to be an average distance of 100 km, was considered.

C4: Disposal

The waste profile landfill disposal model assumes that 10 per cent by weight ends up in landfill, since according to official European Aluminium literature, the recycling rate for aluminium used in the construction and automotive sectors is 90 per cent.

D: Benefits outside the system

Module D assesses the net flows of recovered (recycled or reused) materials and declares the potential loads or benefits from the related processes from the point where the product reaches and exceeds End of Waste status.

Content information

	Product components - % by weight of total EXTRUDED SECONDARY PROFILES			
ALLOYS	**PRE scrap**	**POST Scrap**	**Renewable material**	**Biogenic carbon**
6005 Profiles	45%	36%	0%	0%
6005A Profiles	47%	35%	0%	0%
6060 Profiles	45%	28%	0%	0%
6063 Profiles	46%	31%	0%	0%
6063A Profiles	46%	32%	0%	0%
6082 Profiles	46%	29%	0%	0%

	Product components - % by weight of total CREAL EXTRUDED SECONDARY PROFILES			
ALLOYS	**PRE scrap**	**POST Scrap**	**Renewable material**	**Biogenic carbon**
6060 CREAL Profiles	17.5%	81.6%	0%	0%

	Product components - % by weight of total EXTRUDED PRIMARY PROFILES			
ALLOYS	**PRE scrap**	**POST Scrap**	**Renewable material**	**Biogenic carbon**
6460 Profiles	0%	0%	0%	0%
6463 Profiles	0%	0%	0%	0%
6101 Profiles	0%	0%	0%	0%
6101B Profiles	0%	0%	0%	0%
99.7 Profiles	0%	0%	0%	0%

Packaging materials	Weight - kg per 1 kg Profile
Paper	0.009 kg
Cardboard	0.021 kg
Pallet	0.00036 kg
Timber	0.044 kg
Metal	0.0002 kg
Plastic	0.004 kg
Biogenic carbon	0.0339 kg C

No substances on the ECHA list - Substances of Very High Concern for Authorisation (https://echa.europa.eu/candidate-list-table) are used.

For the average alloys, the following table shows the reference composition percentage ranges as specified in the technical standards.

Alloy designation	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	
	%	%	%	%	%	%	%	%	%	Each	Total
EN AW-6005	97.5-98	0.6-0.9	0.35	0.1	0.1	0.40-0.6	0.1	0.1	0.1	0.05	0.15
EN AW-6005A	96.5-97.2	0.50-0.9	0.35	0.3	0.5	0.40-0.7	0.3	0.2	0.1	0.05	0.15
EN AW-6060	97.85-98.6	0.30-0.6	0.10-0.30	0.1	0.1	0.35-0.6	0.05	0.15	0.1	0.05	0.15
EN AW-6063	97.5-98.35	0.20-0.6	0.35	0.1	0.1	0.45-0.9	0.1	0.1	0.1	0.05	0.15
EN AW-6063A	97.45-98.25	0.30-0.6	0.15-0.35	0.1	0.15	0.6-0.9	0.05	0.15	0.1	0.05	0.15
EN AW-6082	95.2-97	0.7-1.3	0.5	0.1	0.40-1.0	0.6-1.2	0.25	0.2	0.1	0.05	0.15
EN-AW-6463	97.9-98.75	0.2-0.6	0.15	0.20	0.05	0.45-0.9	-	0.05	-	0.05	0.15
EN-AW-6101	97.59-98.44	0.3-0.7	0.5	0.1	0.03	0.35-0.8	0.03	0.1	-	0.05	0.10
EN-AW-6101B	98.15-98.9	0.3-0.6	0.1-0.3	0.05	0.05	0.32-0.6	-	0.1	-	0.03	0.1
EN-AW-99,7	99.36	0.2	0.25	0.03	0.03	0.03	-	0.07	0.03	0.03	

Environmental performance

The average impact of CREAL® secondary profile and primary aluminium alloy profiles is shown

SECONDARY PROFILES								
IMPACT CATEGORY		**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C4**	**D**
Global warming Potential - Total	GWP-Total	kg CO2 eq	7.43E+00	1.47E-01	4.87E-02	5.10E-02	3.92E-03	-6.31E-01
Global warming Potential - Fossil	GWP-Fossil	kg CO2 eq	7.40E+00	1.47E-01	4.84E-02	5.10E-02	3.90E-03	-6.31E-01
Global warming Potential - Biogenic[3]	GWP-Biogenic	kg CO2 eq	1.34E-02	6.00E-04	1.47E-04	2.45E-05	1.30E-05	-3.77E-05
Global warming Potential - Land use and LU change	GWP- Luluc	kg CO2 eq	1.68E-02	5.56E-05	1.02E-04	3.05E-05	4.36E-06	-1.37E-04
Global warming Potential (GWP100a) - IPCC 2013[4]	GWP-GHG	kg CO2 eq	7.17E+00	1.46E-01	4.74E-02	5.05E-02	3.79E-03	-6.13E-01
Ozone depletion Potential	ODP	kg CFC11 eq	4.64E-07	3.17E-08	1.63E-09	1.11E-08	4.26E-10	-3.85E-08
Acidification Potential	AP	mol H+ eq	4.29E-02	5.70E-04	2.46E-04	1.99E-04	2.59E-05	-6.08E-03
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	2.10E-03	9.38E-06	2.30E-05	4.74E-06	1.15E-06	-2.75E-04
Eutrophication Potential, freshwater[5]	EP - freshwater - PO_4	kg PO_4 eq	6.44E-03	2.88E-05	7.06E-05	1.45E-05	3.53E-06	-8.43E-04
Eutrophication Potential, marine	EP - marine	kg N eq	7.69E-03	1.74E-04	4.60E-05	5.44E-05	6.41E-06	-9.38E-04
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	7.78E-02	1.88E-03	4.62E-04	5.94E-04	6.90E-05	-1.02E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	2.40E-02	5.77E-04	1.25E-04	1.86E-04	2.05E-05	-2.79E-03
Resource use Potential, minerals and metals[6]	ADP- minerals&metals	kg Sb eq	1.89E-05	5.43E-07	2.26E-07	3.17E-07	8.64E-09	1.00E-06
Resource use Potential, fossil[6]	ADP-fossil	MJ	7.98E+01	2.08E+00	6.31E-01	7.58E-01	5.55E-02	-5.82E+00
Water deprivation Potential[6]	WDP	m3 depriv.	1.11E+00	6.91E-03	7.90E-03	2.94E-03	1.45E-03	-7.84E-02
OTHER IMPACT INDICATORS								
Particulate matter emissions	PM	disease inc.	6.74E-07	1.20E-08	1.87E-09	3.22E-09	3.88E-10	-7.91E-08

[3] Biogenic carbon (GWP-biogenic) stored and re-emitted was zero; biogenic methane emissions were taken into account.
[4] The indicator includes greenhouse gases in total GWP but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013
[5] Eutrophication indicator, freshwater expressed in molecules of PO_4 eq.: this is obtained by multiplying the molecules of P eq. by a factor of 3.07
[6] The results of this environmental impact indicator should be used with caution because uncertainties about these results are high or indicator experience is limited

Ionising radiation, human health[7]	IRP	kBq U-235 eq	2.94E-01	1.08E-02	7.07E-03	4.23E-03	3.24E-04	-1.07E-02
Ecotoxicity, freshwater[6]	ETP-fw	CTUe	1.65E+02	1.67E+00	9.14E-01	6.65E-01	6.20E+01	-2.93E+01
Human toxicity, cancer effects[6]	HTP-c	CTUh	9.33E-09	6.04E-11	1.40E-11	2.80E-11	3.63E-12	-2.16E-09
Human toxicity, non-cancer effects[6]	HTP-nc	CTUh	1.48E-07	1.78E-09	5.06E-10	6.58E-10	9.57E-11	-3.53E-08
Land use related impacts / Soil quality[6]	SQP	Pt	2.97E+01	1.41E+00	1.02E-01	3.70E-01	7.10E-02	-1.27E+00
USE OF RESOURCES								
Non-renewable primary energy as energy carrier	PENRE	MJ	8.49E+01	2.52E+00	6.70E-01	8.05E-01	5.91E-02	-6.17E+00
Non-renewable primary energy as material utilization	PENRM	MJ	3.15E-01	-3.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	8.52E+01	2.21E+00	6.70E-01	8.05E-01	5.91E-02	-6.17E+00
Renewable primary energy as energy carrier	PERE	MJ	7.61E+00	1.36E+00	8.19E-02	1.61E-02	3.59E-03	-1.70E-01
Renewable primary energy resource as material utilization[8]	PERM	MJ	1.33E+00	-1.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	8.94E+00	3.05E-02	8.19E-02	1.61E-02	3.59E-03	-1.70E-01
Use of secondary materials	SM	kg	1.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels;	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	FW	m3	4.36E-02	2.55E-04	3.71E-04	1.15E-04	4.25E-05	-2.00E-03
WASTE PRODUCED[9]								
Hazardous waste disposed	HWD	kg	3.92E-02	6.72E-06	3.13E-07	2.10E-06	5.53E-08	9.87E-04
Non-hazardous waste disposed	NHWD	kg	1.58E+00	1.08E-01	3.39E-03	2.49E-02	1.05E-01	-3.78E-01
Radioactive waste disposed	RWD	kg	1.73E-04	1.40E-05	1.95E-06	5.00E-06	2.20E-07	-9.81E-06
OUTPUT STREAMS								
Components for re-use.	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling.	MFR	kg	1.97E-02	2.92E-02	0.00E+00	0.00E+00	0.00E+00	9.00E-01
Materials for energy recovery;	MER	kg	0.00E+00	6.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy per energy	EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[7] This impact category mainly concerns the possible impact of low-dose ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or disposal of radioactive waste in underground facilities. This indicator does not measure potential ionising radiation from soil, radon and some building materials
[8] Calorific value of wood (fir) used is 19.6 MJ/kg; paper 12.66 MJ/kg; cardboard 16.94 MJ/kg.
[9] Flows are evaluated using EDIP 2003 methodology

RESULT VARIATIONS - SECONDARY PROFILES			6005 PROFILE	6005A PROFILE	6060 PROFILE	6063 PROFILE	6063A PROFILE	6082 PROFILE
Global warming Potential (GWP100a) - IPCC 2013[10]	GWP-GHG	kg CO2 eq	-12%	-15%	23%	3%	-5%	6%

CREAL PROFILES								
IMPACT CATEGORY		**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C4**	**D**
Global warming Potential - Total	GWP-Total	kg CO2 eq	1.60E+00	1.47E-01	4.87E-02	5.10E-02	3.92E-03	3.37E-01
Global warming Potential - Fossil	GWP-Fossil	kg CO2 eq	1.60E+00	1.47E-01	4.84E-02	5.10E-02	3.90E-03	3.37E-01
Global warming Potential - Biogenic[11]	GWP-Biogenic	kg CO2 eq	5.25E-03	6.00E-04	1.47E-04	2.45E-05	1.30E-05	2.01E-05
Global warming Potential - Land use and LU change	GWP- Luluc	kg CO2 eq	1.34E-03	5.56E-05	1.02E-04	3.05E-05	4.36E-06	7.28E-05
Global warming Potential (GWP100a) - IPCC 2013[12]	GWP-GHG	kg CO2 eq	1.57E+00	1.46E-01	4.74E-02	5.05E-02	3.79E-03	3.27E-01
Ozone depletion Potential	ODP	kg CFC11 eq	1.97E-07	3.17E-08	1.63E-09	1.11E-08	4.26E-10	2.05E-08
Acidification Potential	AP	mol H+ eq	5.61E-03	5.70E-04	2.46E-04	1.99E-04	2.59E-05	3.24E-03
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	3.49E-04	9.38E-06	2.30E-05	4.74E-06	1.15E-06	1.46E-04
Eutrophication Potential, freshwater[13]	EP - freshwater - PO_4	kg PO_4 eq	1.07E-03	2.88E-05	7.06E-05	1.45E-05	3.53E-06	4.50E-04
Eutrophication Potential, marine	EP - marine	kg N eq	1.40E-03	1.74E-04	4.60E-05	5.44E-05	6.41E-06	5.00E-04
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	1.21E-02	1.88E-03	4.62E-04	5.94E-04	6.90E-05	5.42E-03
Photochemical ozone formation Potential	POCP	kg NMVOC eq	4.56E-03	5.77E-04	1.25E-04	1.86E-04	2.05E-05	1.49E-03
Resource use Potential, minerals and metals[14]	ADP- minerals&metals	kg Sb eq	1.81E-05	5.43E-07	2.26E-07	3.17E-07	8.64E-09	-5.33E-07
Resource use Potential, fossil[Errore. Il segnalibro non è definito.]	ADP-fossil	MJ	2.28E+01	2.08E+00	6.31E-01	7.58E-01	5.55E-02	3.11E+00
Water deprivation Potential[Errore. Il segnalibro non è definito.]	WDP	m3 depriv.	4.10E-01	6.91E-03	7.90E-03	2.94E-03	1.45E-03	4.18E-02

[10] The indicator includes greenhouse gases in total GWP but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013
[11] Biogenic carbon (GWP-biogenic) stored and re-emitted was zero; biogenic methane emissions were taken into account.
[12] The indicator includes greenhouse gases in total CC but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013
[13] Eutrophication indicator, freshwater expressed in molecules of PO_4 eq.: this is obtained by multiplying the molecules of P eq. by a factor of 3.07
[14] The results of this environmental impact indicator should be used with caution because uncertainties about these results are high or indicator experience is limited

OTHER IMPACT INDICATORS								
Particulate matter emissions	PM	disease inc.	1.08E-07	1.20E-08	1.87E-09	3.22E-09	3.88E-10	4.22E-08
Ionising radiation, human health[15]	IRP	kBq U-235 eq	1.44E-01	1.08E-02	7.07E-03	4.23E-03	3.24E-04	5.73E-03
Ecotoxicity, freshwater[Errore. Il segnalibro non è definito.]	ETP-fw	CTUe	2.16E+01	1.67E+00	9.14E-01	6.65E-01	6.20E+01	1.56E+01
Human toxicity, cancer effects[Errore. Il segnalibro non è definito.]	HTP-c	CTUh	1.50E-09	6.04E-11	1.40E-11	2.80E-11	3.63E-12	1.15E-09
Human toxicity, non-cancer effects[Errore. Il segnalibro non è definito.]	HTP-nc	CTUh	1.82E-08	1.78E-09	5.06E-10	6.58E-10	9.57E-11	1.88E-08
Land use related impacts / Soil quality[Errore. Il segnalibro non è definito.]	SQP	Pt	1.71E+01	1.41E+00	1.02E-01	3.70E-01	7.10E-02	6.75E-01
USE OF RESOURCES								
Non-renewable primary energy as energy carrier	PENRE	MJ	2.44E+01	2.52E+00	6.70E-01	8.05E-01	5.91E-02	3.29E+00
Non-renewable primary energy as material utilization	PENRM	MJ	3.15E-01	-3.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	2.47E+01	2.21E+00	6.70E-01	8.05E-01	5.91E-02	3.29E+00
Renewable primary energy as energy carrier	PERE	MJ	2.03E+00	1.36E+00	8.19E-02	1.61E-02	3.59E-03	9.05E-02
Renewable primary energy resource as material utilization[16]	PERM	MJ	1.33E+00	-1.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	3.36E+00	3.05E-02	8.19E-02	1.61E-02	3.59E-03	9.05E-02
Use of secondary materials	SM	kg	1.38E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels;	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	FW	m3	1.21E-02	2.55E-04	3.71E-04	1.15E-04	4.25E-05	1.07E-03
WASTE PRODUCED[17]								
Hazardous waste disposed	HWD	kg	4.36E-02	6.72E-06	3.13E-07	2.10E-06	5.53E-08	-5.26E-04
Non-hazardous waste disposed	NHWD	kg	3.47E-01	1.08E-01	3.39E-03	2.49E-02	1.05E-01	2.02E-01
Radioactive waste disposed	RWD	kg	6.14E-05	1.40E-05	1.95E-06	5.00E-06	2.20E-07	5.23E-06
OUTPUT STREAMS								
Components for re-use.	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling.	MFR	kg	1.97E-02	2.92E-02	0.00E+00	0.00E+00	0.00E+00	9.00E-01

[15] This impact category mainly concerns the possible impact of low-dose ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or disposal of radioactive waste in underground facilities. This indicator does not measure potential ionising radiation from soil, radon and some building materials

[16] Calorific value of wood (fir) used is 19.6 MJ/kg; paper 12.66 MJ/kg; cardboard 16.94 MJ/kg.

[17] Flows are evaluated using EDIP 2003 methodology

Materials for energy recovery;	MER	kg	0.00E+00	6.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy per energy	EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PRIMARY PROFILES								
IMPACT CATEGORY		**Unit**	**A1-A3**	**A4**	**C1**	**C2**	**C4**	**D**
Global warming Potential - Total	GWP-Total	kg CO2 eq	2.65E+01	1.47E-01	4.87E-02	5.10E-02	3.92E-03	-3.79E+00
Global warming Potential - Fossil	GWP-Fossil	kg CO2 eq	2.64E+01	1.47E-01	4.84E-02	5.10E-02	3.90E-03	-3.79E+00
Global warming Potential - Biogenic[18]	GWP-Biogenic	kg CO2 eq	4.23E-02	6.00E-04	1.47E-04	2.45E-05	1.30E-05	-2.26E-04
Global warming Potential - Land use and LU change	GWP- Luluc	kg CO2 eq	7.24E-02	5.56E-05	1.02E-04	3.05E-05	4.36E-06	-8.19E-04
Global warming Potential (GWP100a) - IPCC 2013[19]	GWP-GHG	kg CO2 eq	2.55E+01	1.46E-01	4.74E-02	5.05E-02	3.79E-03	-3.68E+00
Ozone depletion Potential	ODP	kg CFC11 eq	1.07E-06	3.17E-08	1.63E-09	1.11E-08	4.26E-10	-2.31E-07
Acidification Potential	AP	mol H+ eq	1.71E-01	5.70E-04	2.46E-04	1.99E-04	2.59E-05	-3.65E-02
Eutrophication Potential, freshwater	EP - freshwater	kg P eq	8.69E-03	9.38E-06	2.30E-05	4.74E-06	1.15E-06	-1.65E-03
Eutrophication Potential, freshwater[20]	EP - freshwater - PO_4	kg PO_4 eq	2.67E-02	2.88E-05	7.06E-05	1.45E-05	3.53E-06	-5.06E-03
Eutrophication Potential, marine	EP - marine	kg N eq	2.81E-02	1.74E-04	4.60E-05	5.44E-05	6.41E-06	-5.63E-03
Eutrophication Potential, terrestrial	EP - terrestrial	mol N eq	2.92E-01	1.88E-03	4.62E-04	5.94E-04	6.90E-05	-6.10E-02
Photochemical ozone formation Potential	POCP	kg NMVOC eq	8.55E-02	5.77E-04	1.25E-04	1.86E-04	2.05E-05	-1.68E-02
Resource use Potential, minerals and metals[21]	ADP- minerals&metals	kg Sb eq	6.16E-05	5.43E-07	2.26E-07	3.17E-07	8.64E-09	6.00E-06
Resource use Potential, fossil[21]	ADP-fossil	MJ	2.61E+02	2.08E+00	6.31E-01	7.58E-01	5.55E-02	-3.49E+01
Water deprivation Potential[21]	WDP	m3 depriv.	3.40E+00	6.91E-03	7.90E-03	2.94E-03	1.45E-03	-4.71E-01
OTHER IMPACT INDICATORS								
Particulate matter emissions	PM	disease inc.	2.22E-06	1.20E-08	1.87E-09	3.22E-09	3.88E-10	-4.75E-07

[18] Biogenic carbon (GWP-biogenic) stored and re-emitted was zero; biogenic methane emissions were taken into account.
[19] The indicator includes greenhouse gases in total CC but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013
[20] Eutrophication indicator, freshwater expressed in molecules of PO_4 eq.: this is obtained by multiplying the molecules of P eq. by a factor of 3.07
[21] The results of this environmental impact indicator should be used with caution because uncertainties about these results are high or indicator experience is limited

Ionising radiation, human health[22]	IRP	kBq U-235 eq	1.09E+00	1.08E-02	7.07E-03	4.23E-03	3.24E-04	-6.44E-02
Ecotoxicity, freshwater[21]	ETP-fw	CTUe	6.53E+02	1.67E+00	9.14E-01	6.65E-01	6.20E+01	-1.76E+02
Human toxicity, cancer effects[21]	HTP-c	CTUh	3.41E-08	6.04E-11	1.40E-11	2.80E-11	3.63E-12	-1.29E-08
Human toxicity. non-cancer effects[21]	HTP-nc	CTUh	6.06E-07	1.78E-09	5.06E-10	6.58E-10	9.57E-11	-2.12E-07
Land use related impacts / Soil quality[21]	SQP	Pt	6.31E+01	1.41E+00	1.02E-01	3.70E-01	7.10E-02	-7.59E+00
USE OF RESOURCES								
Non-renewable primary energy as energy carrier	PENRE	MJ	2.77E+02	2.52E+00	6.70E-01	8.05E-01	5.91E-02	-3.70E+01
Non-renewable primary energy as material utilization	PENRM	MJ	3.15E-01	-3.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	2.77E+02	2.21E+00	6.70E-01	8.05E-01	5.91E-02	-3.70E+01
Renewable primary energy as energy carrier	PERE	MJ	2.87E+01	1.36E+00	8.19E-02	1.61E-02	3.59E-03	-1.02E+00
Renewable primary energy resource as material utilization[23]	PERM	MJ	1.33E+00	-1.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	3.01E+01	3.05E-02	8.19E-02	1.61E-02	3.59E-03	-1.02E+00
Use of secondary materials	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels;	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	FW	m3	1.56E-01	2.55E-04	3.71E-04	1.15E-04	4.25E-05	-1.20E-02
WASTE PRODUCED[24]								
Hazardous waste disposed	HWD	kg	3.37E-02	6.72E-06	3.13E-07	2.10E-06	5.53E-08	5.92E-03
Non-hazardous waste disposed	NHWD	kg	5.25E+00	1.08E-01	3.39E-03	2.49E-02	1.05E-01	-2.27E+00
Radioactive waste disposed	RWD	kg	5.33E-04	1.40E-05	1.95E-06	5.00E-06	2.20E-07	-5.89E-05
OUTPUT STREAMS								
Components for re-use.	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling.	MFR	kg	1.97E-02	2.92E-02	0.00E+00	0.00E+00	0.00E+00	9.00E-01
Materials for energy recovery;	MER	kg	0.00E+00	6.80E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy per energy	EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[22] This impact category mainly concerns the possible impact of low-dose ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or disposal of radioactive waste in underground facilities. This indicator does not measure potential ionising radiation from soil, radon and some building materials
[23] Calorific value of wood (fir) used is 19.6 MJ/kg; paper 12.66 MJ/kg; cardboard 16.94 MJ/kg.
[24] Flows are evaluated using EDIP 2003 methodology

RESULT VARIATIONS - PRIMARY PROFILES			6060 PRIMARY PROFILE	99.7 PRIMARY PROFILE	6101 PRIMARY PROFILE	6101B PRIMARY PROFILE	6463 PRIMARY PROFILE
Global warming Potential (GWP100a) - IPCC 2013[25]	GWP-GHG	kg CO2 eq	0,1%	2,1%	-2,4%	0,1%	0,2%

[25] The indicator includes greenhouse gases in total GWP but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

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