Environmental Product Declaration

EPD Program	Title	Details
International Climate Intelligence System 71-75 Shelton Street Covent Garden, London, WC2H 9JQ United Kingdom office@climateintell.com	Registration #	ICIS-202504-111
	Date of Publication	20.04.2025
	Validity	20.04.2030
	Date of Revision	-

As per ISO 14025 & EN 15804:2012+A2:2019/AC: 2021 for

Aluminium Profiles (Recycled Billets)

The most recent data needs to be provided through an EPD, which may be updated when circumstances change. Thereby the claimed validity is contingent upon on-going validation at www.climateintell.com

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We offer not just
aluminium extrusion
but all things building!
As the largest building
solutions provider in
the Middle East and
Africa.

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1.0 Program Information

1.1 Program

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1.2 Product Group Classification

UN CPC 421

1.3 Product Category Rules

PCR 2020:17 Construction products
(EN 15804:2012+A2:2019/ AC:2021)
Version 1.2.5 dated 01.11.2022 EN 15804
serves as the Core Product Category Rules (PCR)

1.4 Registration Number

ICIS-202504-111

1.5 Date of Publication

20.04.2025

1.6 Valid Until

20.04.2030

1.7 Geographical Scope

Global

2.0 Introduction

This report contains the environmental performance of Aluminium Profiles (recycled billets) manufactured by Aluminium Products Company (ALUPCO) using 93% pre-consumer aluminium scrap and 7% virgin aluminium ingots. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to 1 kg of Aluminium Profiles (recycled billets).

The assessed life cycle includes all phases in the manufacturing process of Aluminium profiles (recycled billets) in “cradle to gate with options” scope. This LCA covers raw material extraction, raw material transportation, production, distribution of final product to customers, end of life use and recovery stages.

This EPD has been conducted according to the program operator regulations and has been verified in accordance with International Climate Intelligence System. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Not only the system, but also their application is described in the Programmer’s Product Category Rules (PCR). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019/AC: 2021.

3.0 Company Information

ALUPCO is the market leader and the largest producer of extruded and surface treated Aluminium profiles in the entire Middle East. As the largest extrusion company in the Middle East and Africa, we have consistently diversified our product portfolio, becoming the trusted service partner of choice for an array of projects. Our headquarters in Dammam, Saudi Arabia serves as the hub for our operations, supported by 9 presses strategically located between Dammam and Jeddah. With a total capacity exceeding 85,000 metric tons per annum, we have emerged as a force to be reckoned with in the market.

At ALUPCO, we pride ourselves on maintaining world-class standards that align with European (EN), British (BS), American (ASTM), and Saudi (SASO) regulations, guaranteeing excellence at every step of our operations. Our dedication to sustainability and environmental responsibility is showcased through accreditations such as the Health Product Declaration (HPD) and Environment Product Declaration (EPD). Additionally, our commitment to LEED requirements further illustrates our focus on delivering high-quality products and services that meet the most demanding international standards.

Aligned with the vision outlined in Saudi Vision 2030, ALUPCO has embraced the “MADE IN SAUDI” initiative by forming strategic partnerships with renowned international firms, resulting in

enhanced local manufacturing capabilities and improved service efficiency at competitive prices. Our top-notch execution, coupled with a seamless supply chain, has translated into significant time and cost savings for our clients.

To ensure exceptional service delivery, we operate sales offices in key locations, including Dammam, Jeddah, Riyadh, Dubai (UAE), Cairo (Egypt), and Orlando (USA). These strategic locations enable us to cater to our customers' diverse needs in the Middle East, Gulf Cooperation Council (GCC), Africa, European Union (EU), Asia and North America, exemplifying our commitment to providing the best services and solutions across the globe.

3.1 Capabilities & Capacities

Dammam Plant – 4 Extrusion Lines

- Range 7, 8.5 and 10 inch
- Brand: SMS – Meer (Germany)
- Production Capacity: 45,000 t / year

Jeddah Plant – 5 Extrusion Lines

- Range 8 and 8.5 inch
- Brand: SMS – Meer (Germany) & UBE (Japan)
- Production Capacity: 40,000 t / year

3.2 Certificates & Memberships

Achieving a landmark within the region, ALUPCO distinguished itself as the first Middle East aluminium's extrusion company to receive ISO 9001 certification in 1995, and we have consistently maintained our standard of excellence, currently holding the updated Quality Management ISO 9001:2015 and ISO 14001:2015 certifications.

4.0 Product Information

The assessed system in this EPD comprises the full life cycle of Aluminium Profiles (recycled billets) using 93% pre-consumer aluminium scrap and 7% virgin aluminium ingots manufactured by ALUPCO in its Dammam plant in Saudi Arabia. This assessment has been done using the production data of 2023 and January to May of 2024.

Mill finish is the basic, uncoated finish of aluminium. It has a slightly dull, metallic appearance and may show some minor imperfections from the extrusion process. Mill finish profiles are often used in applications where the appearance is not critical, or where the profile will be further finished (e.g., painting, powder coating, anodizing).

Using 100% pre-consumer aluminium scrap in profile manufacturing offers significant environmental and economic advantages. Environmentally, it drastically reduces energy consumption compared to primary aluminium production, leading to lower greenhouse gas

emissions and a smaller carbon footprint. It also conserves natural resources by reducing the need for bauxite mining and minimizes waste sent to landfills. Economically, recycled aluminium can be more cost-effective due to lower energy and material costs, and it can provide a market advantage by appealing to environmentally conscious consumers.

Beyond these core benefits, pre-consumer aluminium scrap allows for the production of high-quality profiles as aluminium can be recycled repeatedly without losing its properties. Because pre-consumer scrap is typically cleaner and more easily defined than post-consumer scrap, it can result in recycled aluminium comparable to primary material. Finally, utilizing this scrap supports a circular economy model, maximizing resource use and minimizing waste, contributing to a more sustainable manufacturing process.

4.1 Product Application

ALUPCO's aluminium profiles are used in a wide range of applications, including:

- Construction: Curtain walls, windows, doors, facades
- Transportation: Automotive, aerospace
- Industrial: Machinery, equipment
- Furniture: Frames, supports

5.0 LCA Information

5.1 Declared Unit

The declared unit of the LCA under study is 1 kg of Aluminium Profiles (recycled billets) manufactured using 93% pre-consumer aluminium scrap and 7% virgin aluminium ingots. All direct and indirect environmental impacts, as well as the use of resources, are reported to this unit.

5.2 Time Representativeness

This LCA was performed using data gathered from ALUPCO's Dammam manufacturing plant between January 2023 and May 2024. The following rules for time scope of data were applied - < 10 years for background data and < 2 years for manufacturer's data.

5.3 LCA Software and Database

The LCA software and Ecoinvent database versions that were used for LCA modelling and impact calculations were Air.e.LCA v3.17.4.0 and Ecoinvent v3.10.0, respectively.

5.4 System Boundaries

This EPD covers all product stages from “cradle to gate with options”, i.e. this LCA covers raw material supply (A1), raw material transportation (A2), manufacturing (A3), delivery to customers (A4), End of life stages (C1-C4) and resource recovery stage (D) according to EN 15804 +

A2/AC:2021. The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels and electricity.
- The production of machinery, buildings and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

5.4.1 Raw material supply (A1)

The primary raw material used for the production of Aluminium profiles (recycled billets) is 93% pre-consumer aluminium scrap, 7% virgin aluminium ingots and other alloying elements which are sourced both locally and internationally. 'Raw material supply' includes raw material extraction and pre-treatment process before manufacturing.

5.4.2 Raw material transportation (A2)

This module is relevant for delivery of raw materials from locations both locally and internationally to ALUPCO's manufacturing site.

5.4.3 Manufacturing (A3)

The manufacturing process of aluminium profiles (recycled billets) begins with quality inspection of the received aluminium billets from the suppliers. The billets are then preheated to soften the metal, making it easier to extrude. The preheated billet is placed into an extrusion press, where a ram forces the billet through a steel die, shaping the aluminium into the desired profile. This process produces long, continuous lengths of aluminium profile.

The extruded profiles are immediately cooled to reduce the temperature and solidify the shape. Another quality check is done at this stage before to ensure the extruded billets meet good industry standards. The cooled profiles are then stretched to straighten and remove any twists or bends that may have occurred during the extrusion process. This step ensures the profiles have a uniform shape and alignment.

The straightened profiles are cut to the desired lengths based on customer requirements. The profiles undergo artificial ageing by being heated in an oven for several hours to accelerate the hardening process.

The straightened profiles are cut to the desired lengths based on customer requirements. The profiles undergo artificial ageing by being heated in an oven for several hours to accelerate the hardening process. The profiles are left in their natural, unpolished state, which is referred to as mill finish. This surface retains the natural properties of aluminium and may have some die and tooling marks. The finished profiles are inspected for quality, including surface finish, and mechanical properties prior to delivery to customers.

5.4.4 Delivery to customers (A4)

To create a scenario of the A4 phase, all profiles sold from January 2023 to May 2024 has been analysed as representative of international transport. The final product was delivered by road and sea. Refer table 1 for more information on transport estimations.

Table 1 - Transport estimations for A4 module

Scenario	Parameter	Units	Value Per declared unit
A4 – Cargo ship	Vehicle type used for transport	Transoceanic cargo ship	n/a
	Vehicle load capacity	Kg (dw)	50,000
	Fuel type and consumption	Liters of heavy fuel oil per km	0.24
	Bulk density of transported products	Kg/m3	n/a
	Volume capacity utilisation factor	n/a	1
A4 – Truck	Vehicle type used for transport	>32-ton truck	n/a
	Vehicle load capacity	kg	25,000
	Fuel type and consumption	Liters of diesel per km	0.38
	Bulk density of transported products	Kg/m3	n/a
	Volume capacity utilisation factor	n/a	1

5.4.5 Deconstruction and Demolition (C1)

Data availability on the energy required to demolish per unit mass of aluminium profiles is very scarce. Hence, based on general assumptions about typical demolition methods and equipment efficiency, 0.014 kWh/kg is assumed to be consumed for demolishing 1 kg of aluminium profile. This conservative estimate is loosely based on the generalised assumptions and comparisons with other energy-intensive processes involving aluminium.

5.4.6 Transportation of Demolished items (C2)

This module assumes that 90% of the produced profile is recycled whereas the remaining 10% is to be landfilled. Therefore, an average distance of 50 kms carrying the demolished items on a Euro 6 truck (>32 ton) from the demolition site to nearby recycling centre and landfill sites has been considered. This is a conservative assumption.

Table 2 - Transport estimation of C2 module.

Type	Capacity utilisation	Vehicle type	Average distance
Truck	75%	Euro (6) >32-ton	50 kms

5.4.7 Waste Processing (C3)

This module considers the re-melting process of 90% of the Aluminium Profiles to produce secondary aluminium ingots.

5.4.8 Disposal (C4)

This module accounts for the 10% of the produced profiles to be landfilled.

5.4.9 Reuse, Recycle and Recovery Potential (D)

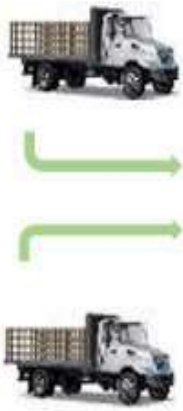
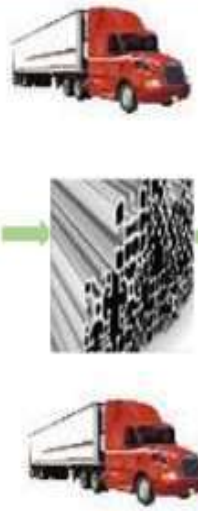
Module D accounts for the benefits from the recycling potential of all the used packaging materials and aluminium profile.

5.5 System boundaries, Scope of study and manufacturing processes diagram

Table 3 - Diagram representing system boundaries included in the LCA for aluminium profiles (recycled billets)

	Production Stage			Construction Process Stage		Use Stage							End of Life Stage				Resource Recovery Stage
	Raw Materials	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction Demolition	Transport	Waste Processing	Disposal	Reuse Recovery Recycling Potential
Module	**A1**	**A2**	**A3**	**A4**	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	**X**	**X**	**X**	**X**	ND	ND	ND	ND	ND	ND	ND	ND	**X**	**X**	**X**	**X**	**X**
Geography	GCC	GCC	KSA	GLO	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data	GWP > 90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	One Product				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	One manufacturing center				-	-	-	-	-	-	-	-	-	-	-	-	-

X = Included, ND = Module not declared, NR = Module not relevant. Modules A5 to B7 are not included as they are considered out of scope for this study.

Scope of this Life Cycle Assessment 'Cradle to Gate with Options'					
A1 Raw Materials Production	**A2 Transport raw materials**	**A3 Manufacture**	**A4 Distribution**	**C1-C4 End of use Stage**	**D Recovering & Recycling**
					
Raw Materials and Chemicals	Transport from supplier by land or sea	Profiles Manufacturing	Transport to customers by trucks & Ships	Demolition, transport, disposal.	Reuse, recovery and recycling potential

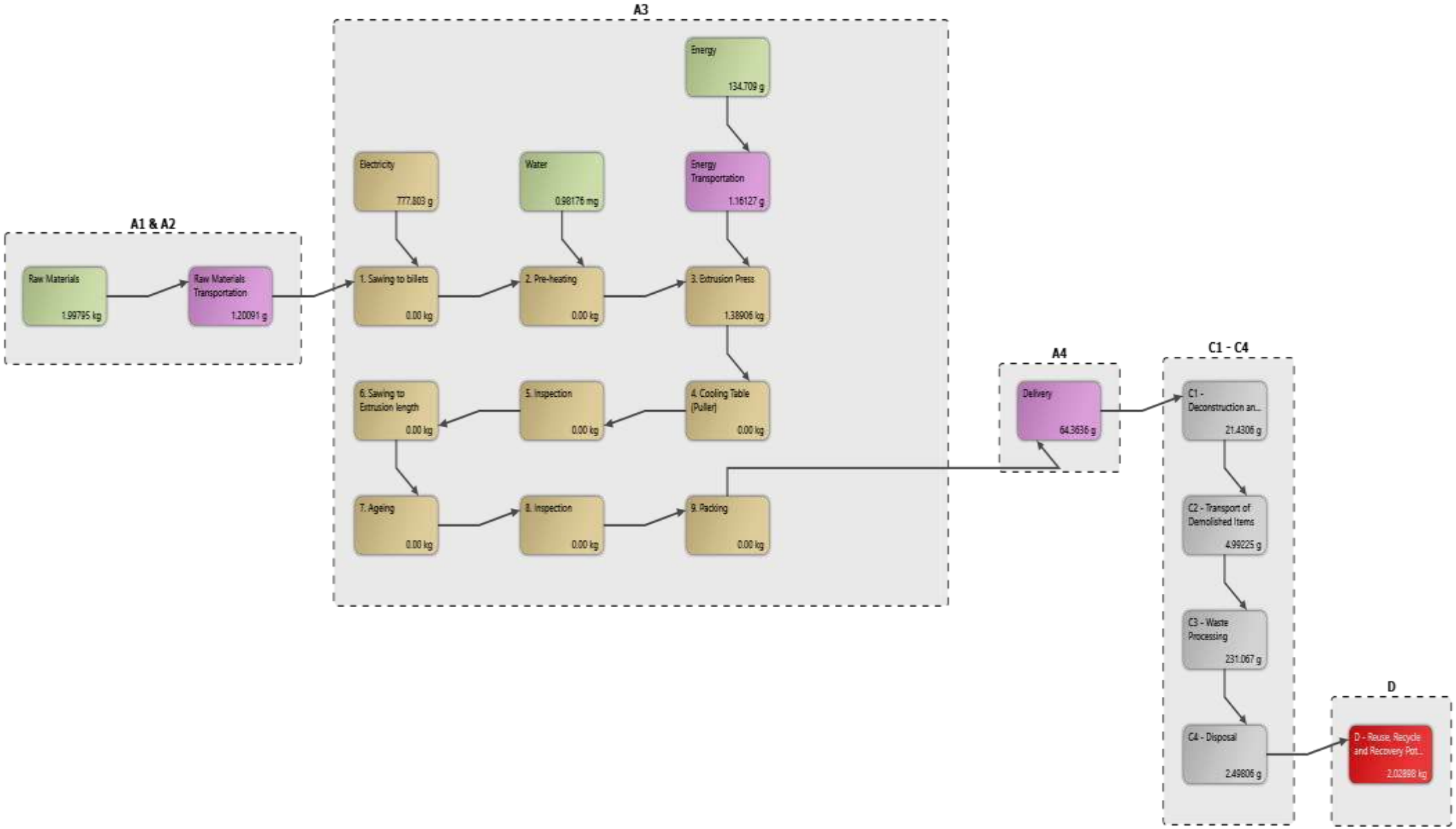


Figure 1 - Screenshot from Air.e.LCA software showing all the manufacturing processes with all the relevant modules included in the LCA.

5.6 Content Declaration

Table 4 - Percentage composition of aluminium profiles (recycled billets) with post-consumer and biogenic material details.

Product Components	Weight (%)	Post – consumer material (%)	Biogenic material (C/kg)
Virgin aluminium	7	0	0
Pre-consumer scrap	93	93	0
Other alloying elements	<1	0	0
Total	**100**	**93**	**0**

Table 5 - Percentage composition of packaging materials used for aluminium profiles (recycled billets)

Packaging materials			
Packaging materials	**Weight (kg)**	**Weight vs the product (kg)**	**Weight of biogenic carbon (C/kg)**
Wooden Pallet	2,155,070	0.15	0
Metal Straps	5,910	0.0004	0
Plastic Sheets	68,800	0.005	0
Total	**2,229,780**	**0.1554**	**0**
*Biogenic carbon content is not present since the packaging weights less than a 5% over the product's weight.			

5.7 Substances listed in the "Candidate List of SVHC"

During the life cycle of the product no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

5.8 Technical Information

5.8.1 Cut-off rules

More than 99% of the materials and energy consumption have been included. Polluter Pays Principle and modularity principle according to EN 15804 has been followed for this LCA.

5.8.2 Allocation

The general allocation rule, which expresses the percentage of production of each individual product in total production in kilograms, serves as the basis for allocating common inputs and outputs. For the manufacture of input materials, generic process data was used.

5.8.3 Electricity

A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Saudi Arabia, has been used for this LCA.

5.8.4 Calculation Rules

Datasets from Ecoinvent 3.10.0 with emission factors for raw materials and generic chemicals have been characterized to adjust them to the characteristics of manufacturing of suppliers or countries where suppliers are located. Specific datasets with the emissions factors corresponding to the fuel combustion of the manufacturing plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact. Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment. This LCA has been done using "**Allocation, cut-off by classification**" (also known as cut-off) system model.

All transport of components has been included in the LCA considering real distances travelled by materials used for production. It is estimated in a global scale according to Ecoinvent™ criteria. As exact port locations are not known in detail, transport distances have been calculated from one of the ports in the country of origin to the factory. Port operations have also been excluded. Road distances calculated using Google Maps. Maritime distances calculated using Marine Traffic Voyage Planner.

5.8.5 By-products Assignment

There are no by-products in this EPD, hence no allocation had to be applied.

6.0 Environmental Performance

6.1 Potential Environmental Impacts

In the following tables, the environmental performance of aluminium profiles (recycled billets) manufactured using 93% pre-consumer scrap and 7% virgin aluminium ingots by ALUPCO has been presented. The differences in the consumption of electricity, water and raw materials used in manufacturing was not evident during the assessment. Hence, the calculation is based on total production vs total consumption against production of the product. Environmental impacts were calculated using EF 3.1, (ILCD). The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding thresholds values, safety margins or risks.

6.1.1 Core Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change (GWP) – fossil	kg CO2e	1.98E+00	1.20E-03	2.30E+00	6.43E-02	ND	ND	2.14E-02	4.99E-03	2.30E-01	2.49E-03	-2.01E+00
Climate change (GWP) – biogenic	kg CO2e	1.12E-02	1.79E-07	1.09E-03	9.58E-06	ND	ND	2.63E-06	7.98E-07	1.30E-03	6.76E-06	-1.57E-02
Climate change (GWP) – LULUC	kg CO2e	3.41E-03	4.93E-07	3.61E-04	2.64E-05	ND	ND	9.45E-07	2.11E-06	1.58E-04	3.15E-06	-4.21E-03
Climate change (GWP) – total	kg CO2e	2.00E+00	1.20E-03	2.30E+00	6.44E-02	ND	ND	2.14E-02	4.99E-03	2.31E-01	2.50E-03	-2.03E+00
Ozone depletion	kg CFC11e	2.87E-08	2.00E-11	4.35E-08	8.20E-10	ND	ND	3.80E-10	7.00E-11	1.28E-09	4.00E-11	-2.20E-08
Acidification	mol H+e	1.10E-02	2.60E-06	1.77E-02	1.40E-04	ND	ND	1.20E-04	1.00E-05	7.30E-04	1.00E-05	-1.18E-02
Eutrophication, aquatic freshwater	kg PO4e	1.26E-03	2.56E-07	2.66E-04	1.37E-05	ND	ND	7.48E-07	1.10E-06	9.54E-05	1.22E-06	-1.92E-03
Eutrophication, aquatic freshwater	Kg P eq	4.10E-04	8.34E-08	8.68E-05	4.47E-06	ND	ND	2.44E-07	3.58E-07	3.11E-05	3.98E-07	-6.24E-04
Eutrophication, aquatic marine	kg Ne	2.68E-03	6.25E-07	6.39E-03	3.35E-05	ND	ND	1.89E-05	3.20E-06	1.63E-04	7.98E-06	-2.97E-03
Eutrophication, terrestrial	mol Ne	2.87E-02	6.68E-06	6.92E-02	3.60E-04	ND	ND	1.90E-04	3.00E-05	1.78E-03	6.00E-05	-3.20E-02
Photochemical ozone formation	kg NMVOCe	1.09E-02	3.69E-06	2.14E-02	1.98E-04	ND	ND	7.37E-05	1.87E-05	5.82E-04	1.69E-05	-1.10E-02
Abiotic depletion, minerals & metals	kg Sbe	6.27E-06	4.03E-09	4.70E-06	2.16E-07	ND	ND	8.03E-09	1.44E-08	3.17E-06	6.56E-09	-8.69E-05
Abiotic depletion of fossil resources	MJ	2.87E+01	1.62E-02	3.85E+01	8.68E-01	ND	ND	3.22E-01	7.30E-02	1.35E+00	4.14E-02	-2.63E+01
Water use	m3e depr.	6.32E-01	8.35E-05	1.19E-01	4.47E-03	ND	ND	1.44E-03	4.23E-04	2.39E-02	1.64E-02	-1.53E+00

Note - EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

6.1.2 Additional Environmental Impact Indicators

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2.01E-07	7.31E-11	6.52E-08	3.92E-09	ND	ND	8.76E-10	3.82E-10	1.38E-08	2.52E-10	-2.04E-07
Ionizing radiation, human health	kBq U235e	5.55E-02	1.42E-05	1.30E-02	7.60E-04	ND	ND	4.15E-05	6.72E-05	2.20E-03	9.39E-05	-1.02E-01
Eco-toxicity (freshwater)	CTUe	1.45E+01	4.31E-03	3.55E+00	2.31E-01	ND	ND	2.21E-02	1.71E-02	1.12E+00	1.76E+01	-3.69E+01
Human toxicity, cancer effects	CTUh	2.66E-08	6.45E-12	4.50E-09	3.46E-10	ND	ND	2.39E-11	2.62E-11	1.20E-09	1.29E-11	-3.27E-08
Human toxicity, non-cancer effects	CTUh	1.57E-08	1.09E-11	6.54E-09	5.82E-10	ND	ND	3.86E-11	4.94E-11	3.08E-09	3.98E-10	-3.74E-08
Land use related impacts/soil quality	Dimensionless	6.90E+02	1.05E-02	2.29E+00	5.62E-01	ND	ND	1.23E-02	7.79E-02	7.99E-01	6.59E-02	-6.94E+02

Note - EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

6.1.3 GWP-GHG Impacts

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP - GHG	Kg Co2e	1.99E+00	1.20E-03	2.30E+00	6.44E-02	ND	ND	2.14E-02	4.99E-03	2.30E-01	2.49E-03	-2.01E+00

Note - This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). This indicator Is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

6.1.4 Use of Natural Resources

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	9.46E+01	2.28E-04	2.41E-01	1.22E-02	ND	ND	5.82E-04	1.00E-03	8.40E-02	1.28E-03	-9.55E+01
Renewable PER used as materials	MJ	4.68E-03	9.61E-07	1.21E-03	5.15E-05	ND	ND	4.35E-06	4.41E-06	1.69E-04	5.79E-06	-6.45E-03

Total use of renewable PER	MJ	9.46E+01	2.29E-04	2.42E-01	1.23E-02	ND	ND	5.86E-04	1.00E-03	8.42E-02	1.29E-03	-9.55E+01
Non-renew. PER used as energy	MJ	2.87E+01	1.62E-02	3.85E+01	8.68E-01	ND	ND	3.22E-01	7.30E-02	1.35E+00	4.14E-02	-2.63E+01
Non-renew. PER used as materials	MJ	4.58E-06	1.63E-09	7.61E-07	8.74E-08	ND	ND	2.43E-09	1.03E-08	2.55E-07	2.08E-08	-5.58E-06
Total use of non-renewable PER	MJ	2.87E+01	1.62E-02	3.85E+01	8.68E-01	ND	ND	3.22E-01	7.30E-02	1.35E+00	4.14E-02	-2.63E+01
Use of secondary materials	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	0.00E+00	1.38E-03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

6.1.5 End of Life – Waste

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00
Non-hazardous waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

6.1.6 End of Life – Outflows

Impact Category	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E+00
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	9.00E-01	9.00E-01	0.00E+00	1.06E+00

Materials for energy recovery	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

6.1.7 Biogenic Carbon Content

Details	Unit	A1-A3
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in accompanying packaging	Kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157" Disclaimer: “According to the EN 15804:2012+A2:2019 standard, the LCIA results are relative expressions translating impacts into environmental themes such as climate change, ozone depletion, etc. (midpoint impact categories). Thus, the LCIA results do not predict impacts on category endpoints such as impact on the extinction of species or human health. In addition, the results do not provide information about the exceeding of thresholds, safety margins or risks”.

6.2 Interpretation of LCA results

As tabulated in core environmental indicators, A1-A3 modules have a higher impact representing 95.82% of the total impact while A4 module represents 1.25%. Modules C1-C4 represent 2.93% of the total impact. Refer below table for a more detailed explanation.

To conclude, the study provides a fair understanding of the environmental impacts during the various life cycle stages of aluminium profiles (recycled billets) production. It also identifies hotspots in the value-chain where improvement activities can be prioritized and accordingly actions can be planned. The scope covers the ecological information to be divided into raw material supply (A1), raw material transportation (A2), manufacturing (A3), delivery to customers (A4), demolition and deconstruction (C1), transportation of demolished items (C2), waste processing (C3), disposal (C4) as well as the end-of-life stage recycling (D) considerations.

Table 6 - Interpretation of the most significant contributors to LCA parameters

Impact Indicator	Description	Most significant contributor
Depletion of abiotic resources – fossil fuels	Indicator of the depletion of natural fossil fuel resources.	The total cradle to gate impact is 6.99E+01 (69.91) MJ. A1–A2 (41.07%) and A3 (55.14%) has the highest impacts. A total credit of -2.63E+01 MJ is taken in module D.
Climate Change (Global Warming Potential- GWP-GHG)	Indicator of potential global warming due to emissions of greenhouse gases to the air. Divided into 3 subcategories based on the emission source: (1) fossil resources, (2) bio-based resources, and (3) land use change.	The total cradle to gate impact is 4.63E+00 (4.63) kg CO2 eq. A1 – A2 (43.17%) followed by A3 (49.74%) has the highest impacts. A total credit of -2.03E+00 kg CO2eq is obtained in module D.
Climate change (fossil)	Indicator of the Climate change is largely driven by the release of greenhouse gases like CO2.	The total cradle to gate impact is 4.61E+00 (4.61) kg CO2 eq. A1 – A2 (43.06%) and A3 (49.91%) has the highest impacts. A total credit of -2.01E+00 kg CO2 eq is obtained in module D.

7.0 Mandatory Statements

Explanatory material can be obtained from EPD owner and/or LCA author. The verifier and the Program Operator do not make any claim or present any responsibility for the legality of the product. The EPD owner has the sole ownership, liability, and responsibility for the EPD. The LCA author shall not be liable with respect to manufacturer information, life cycle assessment data and evidence.

EPDs within the same product category but registered in different EPD programs may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the

same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; have equivalent content declarations; and be valid at the time of comparison.

8.0 Additional Information

ALUPCO's Code of Conduct outlines the company's commitment to ethical business practices and responsible corporate behaviour. The code emphasizes the importance of health and safety, prioritizing a safe working environment through comprehensive training and adherence to regulations. Environmental stewardship is a key focus, with efforts to reduce waste, conserve resources, and promote sustainability.

ALUPCO is dedicated to social responsibility, engaging in community development and supporting philanthropic initiatives. The company upholds high standards of quality in its products and services, maintaining strict quality control measures and investing in innovation. Integrity and honesty are fundamental, with strict prohibition on corruption and bribery.

Employment practices emphasize equal opportunity, a respectful workplace, and a zero-tolerance policy for child labour, forced labour, and human trafficking. The responsible use of information technology resources and the protection of confidential information are also highlighted. ALUPCO values transparent and accountable interactions with external parties and corporate partners, conducting thorough due diligence and ensuring fair dealings.

The company encourages employees and stakeholders to speak up about concerns and report unethical behaviour, providing confidential channels for reporting misconduct. Overall, the code aims to maintain a culture of trust, integrity, and respect, contributing to the company's sustainable growth and success.

9.0 Verification

Diffusion Institution	International Climate Intelligence System 71-75 Shelton Street Covent Garden London, WC2H 9JQ United Kingdom
Registration Number	ICIS-202504-111
Date of Publication	20.04.2025
Valid until	20.04.2030
Geographical Scope	Global
Product category rules (PCR): PCR 2020:17 Construction products (EN15804:2012+A2:2019/	

AC:2021) Version 1.2.5 dated 01.11.2022. EN 15804 serves as the Core Product Category Rules (PCR)
PCR review was conducted by: International Climate Intelligence System.
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: ☐ EPD Process Certification (internal) ☒ EPD Verification (external)
Third party verifier: Mr. Luis Manuel, San Adrián, Spain Accredited by: International Climate Intelligence System

10.0 Contact Information

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11.0 References

- ISO 14040:2006 “Environmental management -- life cycle assessment -- principles and framework”; ISO 14044:2006 “Environmental management -- life cycle assessment -- requirements and guidelines”; ISO 14020:2000 “Environmental Labels and declarations - General Principles.
- ISO 14025:2006 “Environmental labels and declarations -- type III environmental declarations -- principles and procedures”. EN 15804+A2:2019/AC:2021 European Committee for Standardization: Environmental product declarations – Core rules for the product category of construction products.
- General Programme Instructions of the International Climate Intelligence System (v2.0, 2023).