

ENVIRONMENTAL PRODUCT DECLARATION

 **EPD**[®]
THE INTERNATIONAL EPD[®] SYSTEM



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In accordance with
ISO 14025 for:

Uncoated
Aluminium
Profile
from Tuna
Aluminium



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Programme: The International EPD[®] System,
www.environdec.com EPD Turkey, www.epdturkey.org

Programme operator: EPD International AB &
EPD Turkey

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



ENVIRONMENTAL PRODUCT DECLARATIONS



THE INTERNATIONAL EPD® SYSTEM

Programme

EPD Turkey, a fully aligned regional programme.

www.epdturkey.org

The International EPD® System

www.environdec.com

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Geographical Scope

Global

UN CPC Code

42532

(Bars, rods and profiles, of aluminium)

EPD OWNER



ALUMINIUM

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Product Category Rules (PCR)	2019:14 Version 1.1, 2019-09-14 Construction Products EN 15804:2012 + A2:2019 Sustainability of Construction Works
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Independent third-party verification of the declaration and data, according to ISO 14025:2006	EPD process certification () EPD verification (X)
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Third party verifier	Professor Vladimír Kocí
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Approved by	The International EPD® System
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Procedure for follow-up of data during EPD validity involves third party verifier	Yes () No (X)
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The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs for construction products are primarily intended for use in B2B communication, but their use in B2C communication under certain conditions is not precluded. For EPDs intended for B2C communication, refer to ISO 14025.

About Company



Tuna Aluminium Reliable Aluminium Profile Supplier

Founded in 1989, Tuna Aluminium has become one of the leading regional players in aluminium extrusion industry, by staying one step ahead of change throughout its journey of 33 years.

Tuna Aluminium has been producing the profiles to various sectors including automotive, machinery, building materials, lighting, energy, electronic, marine, furniture and decoration.

Tuna Aluminium offers full service under one roof and product excellence with the Extrusion, Anodizing, Powder Coating and Machining Lines.

Quality

Product quality and customer satisfaction is at the heart of the Tuna Aluminium and we use the most advanced technological equipment in the industry.

While all processes, the profiles are carefully inspected for irregularities and the surface conditions is to the highest standard. Quality is the upmost importance for us.

Research and Development

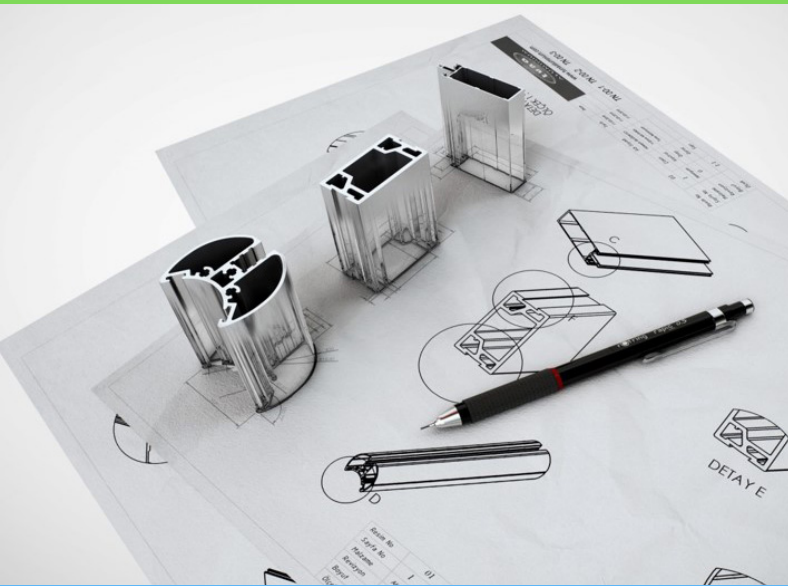
Research and further development have been the highest priority of Tuna Aluminium. Our work is continually being carried out to find new solutions and innovations using the latest cad/cam workstations.

Logistic

The Tuna Aluminium Quality requires high-performance logistics perfectly organize time management ensures deliveries arrive at their destinations on time.



Product Information

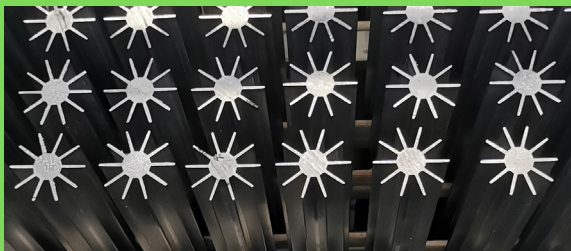


Uncoated Aluminium Profiles

Tuna Aluminium able to extrude from 30g/mt to 27kg/mt and the maximum profile width is 300mm. All parameters in the extrusion process are in control for getting highest and sustainable results.

The extruded profiles are subsequently being treated and aging furnished to give them their desired strength and the maximum profile length is 15 meters.

Aluminium is an environmental metal which can be recycled up to rate %97.



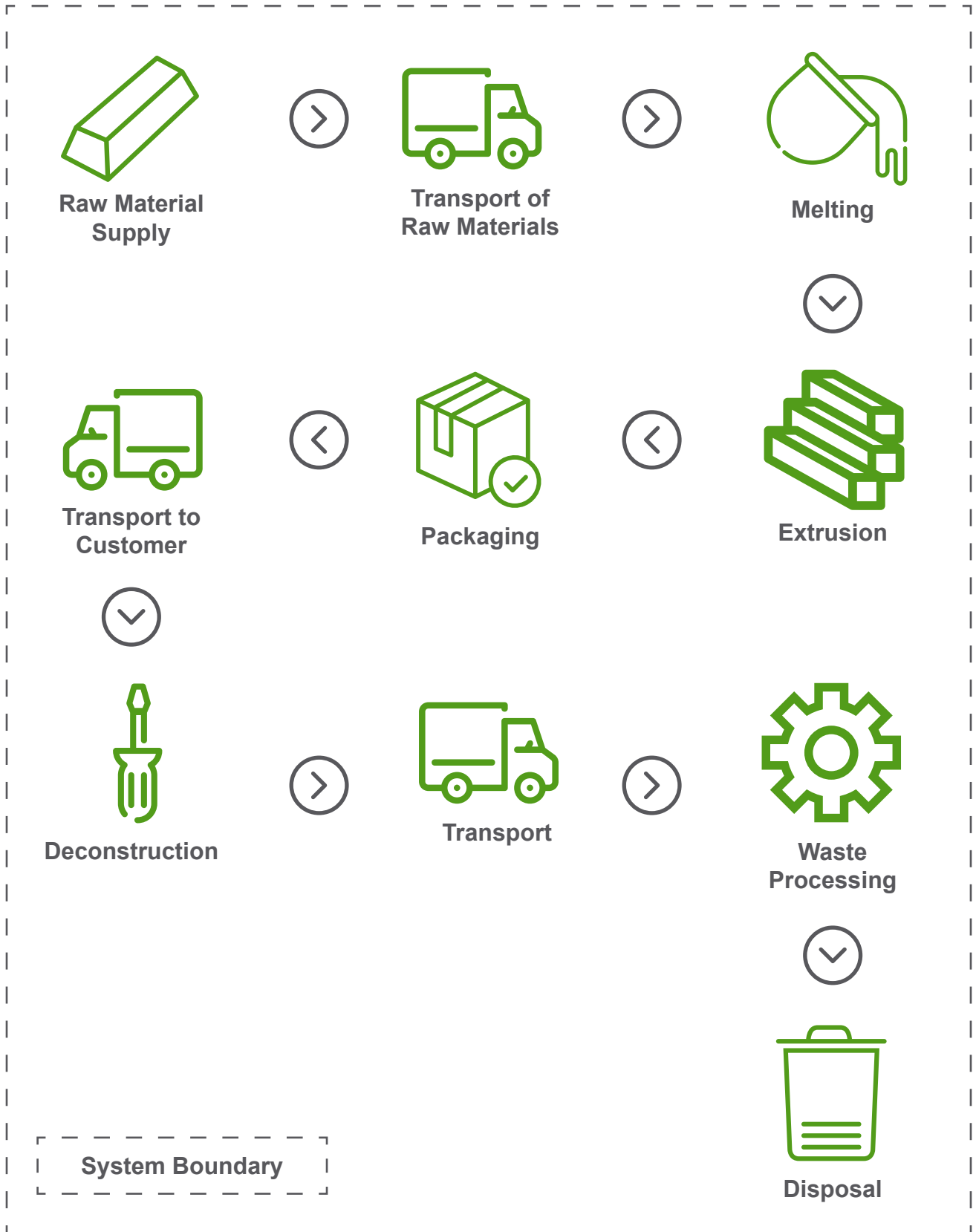
LCA Information

Functional Unit	1 kg of Uncoated Aluminium Profile
Time Representativeness	2021
Database(s) and LCA Software Used	Ecoinvent 3.6, TLCID (Turkish Lifecycle Inventory Database) and SimaPro 9.1
System Boundaries	A1-A4, C1-C4 and D.
Allocation	No allocation performed
Cut-Off Rules	No cut-off rule was applied within the LCA study underlying this EPD.

Upstream	Core		Downstream	Other Environmental Information												
	Raw Material Supply	Manufacturing			Future reuse, recycling or energy recovery potentials											
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

*ND: Not declared.

System Boundary



System Description

A1: Raw Material Supply

Raw material supply includes raw material extraction and pre-treatment processes before its use. Raw material consists of 22% recycled content.

A2: Transport

Raw material transport distances are calculated according to 2020 supply figures of Tuna Aluminium.

A3: Manufacturing

Manufacturing processes consist of melting, extruding and packaging steps for uncoated aluminium profile at Tuna Aluminium.

A4: Transport

Transport of aluminium profiles to consumers are modelled according to 2020 transport figures of Tuna Aluminium for uncoated aluminium.

C1: Deconstruction, demolition

For deconstruction stage, 0.239 MJ electricity use per kg of material was assumed (Gervasio et al., 2018).

C2: Transport

This step covers transport of materials after deconstruction. Average distance was assumed as 100 km from demolition site to waste processing site for disposal.

C3: Waste Processing

Wastes can be recycled directly or disposed of according to different scenarios. No process is needed.

C4: Disposal

It was assumed that 95% of aluminium profile is recycled, other 5% was landfilled.

D: Future reuse, recycling or energy recovery potentials

22% of raw materials, 95% of materials after demolition and 80% of packaging materials were included as benefit because of their recycling.



ENVIRONMENTAL PERFORMANCE OF TUNA ALUMINIUM

Potential Environmental Impact

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - Fossil	kg CO ₂ eq	19.2	0.2	28.8 x10 ⁻⁶	16.3 x10 ⁻³	0	2.03 x10 ⁻³	-4.45
GWP - Biogenic	kg CO ₂ eq	-65.9 x10 ⁻³	43.1 x10 ⁻⁶	0.87 x10 ⁻⁶	4.85 x10 ⁻⁶	0	21.4 x10 ⁻⁶	14.1 x10 ⁻³
GWP - Luluc	kg CO ₂ eq	25 x10 ⁻³	58.7 x10 ⁻⁶	62.1 x10 ⁻⁹	4.84 x10 ⁻⁹	0	1.65 x10 ⁻⁶	-5.73 x10 ⁻³
GWP - Total	kg CO ₂ eq	19.1	0.2	29.7 x10 ⁻⁶	16.3 x10 ⁻³	0	2.05 x10 ⁻³	-4.44
ODP	kg CFC11 eq	0.76 x10 ⁻⁶	45.2 x10 ⁻⁹	2.22 x10 ⁻¹²	3.74 x10 ⁻⁹	0	0.25 x10 ⁻⁹	-0.16 x10 ⁻⁶
AP	mol H ⁺ eq	0.1	0.86 x10 ⁻³	0.22 x10 ⁻⁶	46.9 x10 ⁻⁶	0	13.8 x10 ⁻⁶	-23.9 x10 ⁻³
EP - Freshwater	kg P eq	7.73 x10 ⁻³	15.8 x10 ⁻⁶	29.8 x10 ⁻⁹	1.33 x10 ⁻⁶	0	0.7 x10 ⁻⁶	-1.82 x10 ⁻³
*EP - Freshwater	kg PO ₄ eq	23.6 x10 ⁻⁶	48.3 x10 ⁻⁶	91.1 x10 ⁻⁹	4.06 x10 ⁻⁶	0	2.14 x10 ⁻⁶	-5.58 x10 ⁻³
EP - Marine	kg N eq	17.4 x10 ⁻³	0.25 x10 ⁻³	29.9 x10 ⁻⁹	8.98 x10 ⁻⁶	0	3.24 x10 ⁻⁶	-3.91 x10 ⁻³
EP - Terrestrial	mol N eq	0.17	2.70 x10 ⁻³	0.49 x10 ⁻⁶	99.8 x10 ⁻⁶	0	35.7 x10 ⁻⁶	-40.3 x10 ⁻³
POCP	kg NMVOC eq	51 x10 ⁻³	0.82 x10 ⁻³	67.2 x10 ⁻⁹	37.9 x10 ⁻⁶	0	10.3 x10 ⁻⁶	-11.9 x10 ⁻³
ADPE	kg Sb eq	44.4 x10 ⁻⁶	0.58 x10 ⁻⁶	12.4 x10 ⁻¹²	49.3 x10 ⁻⁹	0	1.23 x10 ⁻⁹	-10.8 x10 ⁻³
ADPF	MJ	227	3.01	0.6 x10 ⁻³	0.25	0	29.9 x10 ⁻³	-52.3
WDP	m ³ depriv.	111	20.5 x10 ⁻³	8.31 x10 ⁻⁶	1.70 x10 ⁻³	0	0.83 x10 ⁻³	-0.54
PM	disease inc.	0.74 x10 ⁻⁶	13.8 x10 ⁻⁹	0.8 x10 ⁻¹²	1.04 x10 ⁻⁹	0	0.18 x10 ⁻⁹	-0.17 x10 ⁻⁶
IR	kBq U-235 eq	0.19	14.3 x10 ⁻³	16.4 x10 ⁻⁶	1.21 x10 ⁻³	0	0.19 x10 ⁻³	-41.6 x10 ⁻³
ETP - FW	CTUe	377	2.15	0.35 x10 ⁻³	0.18	0	31	-89.7
HTTP - C	CTUh	15.4 x10 ⁻⁹	62.7 x10 ⁻¹²	7.65 x10 ⁻¹⁵	5.17 x10 ⁻¹²	0	1.73 x10 ⁻¹²	-3.72 x10 ⁻⁹
HTTP - NC	CTUh	0.36 x10 ⁻⁶	2.45 x10 ⁻⁹	0.28 x10 ⁻¹²	0.2 x10 ⁻⁹	0	48.9 x10 ⁻¹²	-87.6 x10 ⁻⁹
SQP	Pt	30.7	2	0.12 x10 ⁻³	0.17	0	34.7 x10 ⁻³	-6.95

Acronyms: GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.

Legend: A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site, A5: Installation, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.

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

Disclaimer 2: 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 experienced with the indicator.

*EP-Freshwater: This indicator has been calculated as "kg P eq" as required in the characterization model. (EUTREND model, Struijs et al, 2009b, as implemented in ReCiPe; <http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>)

Use of Resources

Impact Category	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	6.62	30.1 x10 ⁻³	95.3 x10 ⁻⁶	2.65 x10 ⁻³	0	1.64 x10 ⁻³	-1.44
PERM	MJ	0	0	0	0	0	0	0
PERT	MJ	6.62	30.1 x10 ⁻³	95.3 x10 ⁻⁶	2.65 x10 ⁻³	0	1.64 x10 ⁻³	-1.44
PENRE	MJ	227	3.01	0.6 x10 ⁻³	0.25	0	29.9 x10 ⁻³	-52.3
PENRM	MJ	0	0	0	0	0	0	0
PENRT	MJ	227	3.01	0.6 x10 ⁻³	0.25	0	29.9 x10 ⁻³	-52.3
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m ³	2.03	0.51 x10 ⁻³	0.17 x10 ⁻⁶	42.6 x10 ⁻⁶	0	22.1 x10 ⁻⁶	-16.3 x10 ⁻³

Acronyms : PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.



Outout Flows

Impact Category	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	3.44 x10 ⁻³	0	0	0	0	0	0
NHWD	kg	31.7 x10 ⁻³	0	0	0	0	1	0
RWD	kg	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0
MFR	kg	31.7 x10 ⁻³	0	0	0	0	0.95	0
MER	kg	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0

HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.



References

Ecoinvent

Ecoinvent Centre, www.ecoinvent.org

ELCD Database

European Platform on Life Cycle Assessment, <https://eplca.jrc.ec.europa.eu/ELCD3/>

EN ISO 9001

Quality Management Systems - Requirements

EN ISO 14001

Environmental Management Systems - Requirements

GPI

General Programme Instructions of the International EPD® System. Version 3.0.

ISO 45001

Occupational Health & Safety Management System - Requirements

ISO 14020:2000

Environmental Labels and Declarations — General principles

EN 15804:2012+A2:2019

Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

ISO 14025 DIN EN ISO 14025:2009-11

Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040/44/ DIN EN ISO 14040:2006-10

Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

SimaPro

SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

The International EPD® System

The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

Contact Information



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EPD registered through fully aligned regional programme.

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