



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 for
RECYCLED POLYPROPYLENE PALLET:
LOGYPAL 1®

from



RELICYC
YOUR GREEN EFFICIENCY PARTNER

PROGRAMME: The International EPD® System, www.environdec.com

PROGRAMME OPERATOR: EPD International AB

EPD REGISTRATION NUMBER: S-P-09135

PUBLICATION DATE: 2023-06-26

VALID UNTIL: 2028-06-25



PROGRAMME INFORMATION

PROGRAMME: The International EPD® System

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Accountabilities for PCR, LCA and independent, third-party verification

PRODUCT CATEGORY RULES (PCR)

PCR: PACKAGING PRODUCT CATEGORY CLASSIFICATION:

MULTIPLE CPC

PCR 2019:13 VERSION 1.1

VALID UNTIL: 2023-11-08

PCR review was conducted by:

APE-PACKAGING WORKING GROUP

(Università degli Studi di Milano - Department of Chemistry

<http://www.ape.unimi.it/lca-studies/>, QUOTA SETTE Srl

LIFE CYCLE ASSESSMENT (LCA)

LCA accountability: Spinlife – Spinoff dell'Università di Padova

THIRD-PARTY VERIFICATION

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

EPD verification by accredited certification body

Third-party verification: Bureau Veritas Italia S.p.A. is an approved certification body accountable for the third-party verification

The certification body is accredited by:
Accredia (Noo09PRD)

Procedure for follow-up of data during EPD validity involves third-party verifier:

Yes No

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.

EPDs within the same product category but from different programmes may not be comparable.

EPD owner has the sole ownership, liability and responsibility of the EPD. The environmental impacts of different EPDs can be compared only taking into account all the technical information supporting the declared/functional unit definition as requested by the PCR.

40 ANNI DI INNOVAZIONE SOSTENIBILE

Relicyc è una realtà che ha alle spalle una lunga storia nella gestione completa del materiale da pallet a fine utilizzo, sia legnoso che plastico, dal suo recupero alla sua reintroduzione nel mercato per una nuova vita. Con oltre 40 anni di esperienza, oggi si distingue fra i più competenti attori del settore, ponendosi come partner capace di creare nuova efficienza ambientale per i propri clienti.

Il modello adottato nasce da un'esigenza di sostenibilità che mira a riutilizzare le risorse a fine vita e indirizzarle correttamente al riciclo, in modo che possano trovare nuovi utilizzi producendo nel contempo nuovo valore per le aziende coinvolte.



40 YEARS OF SUSTAINABLE INNOVATION

Relicyc has a long history in managing end-of-life plastic and wooden pallets: from recovery to reintroduction into the marketplace, it gives the material a new lease on life. Over 40 years of experience has led the company to become a prominent player in the field and a partner that today's environmental-efficient customers can rely on.

The need for sustainability is what drives our model, whose focus is on re-using resources at the end of their life and routing them properly for recycling so they can find new uses while bringing the businesses involved new value.



VICINI AI CLIENTI PER CONDIVIDERNE GLI OBIETTIVI

Il sistema Relicyc è specifico, unico, esclusivo e circolare perché da qualunque parte lo si approcci trasforma con efficienza l'utilizzo e il recupero di pallet in plastica nel punto di partenza di una collaborazione volta ad accompagnare le aziende in un percorso di sostenibilità.

Secondo una moderna ottica di "sistema azienda", Relicyc parte dai bisogni di clienti e fornitori per arrivare a condividere obiettivi come:

- **Efficienza di prodotto**
- **Efficienza nella logistica**
- **Efficacia del servizio**
- **Gentilezza verso l'ambiente**

CLOSER TO CUSTOMERS THROUGH SHARED GOALS

The Relicyc system is specific, unique, exclusive and circular: whatever way you look at it, it efficiently transforms the use and recovery of plastic pallets into the starting point of a partnership based on shared sustainability goals. Relicyc operates according to a modern "business system" view. It starts off from the ideas of customers and suppliers to arrive at developing shared goals such as:

- **Product efficiency**
- **Logistics efficiency**
- **Service effectiveness**
- **Kindness to the environment**

COMPANY INFORMATION

Relicyc, consisting of two production site located in Tombelle di Vigonovo (VE), is the founder of an industrial group among the largest in Italy in the sector, expert in recycled waste management from the recovery to the regeneration phase; there are plants dedicated to the collection and processing of plastic and wood material. In particular the first site, named as Imball 01, is developed on an area of about 7500 m², in which in addition to the administrative and commercial offices, there is also a large warehouse for the storage of finished products and the shipments management and a quality control unit. The second site, called Imball 02, instead, is dedicated to grinding and is spread over an area of approximately 3343 m² (1420 of which covered); in addition to administrative and commercial offices there are the following departments: selection, shredding and grinding.

The modern production department of secondary raw materials consists of a shredding plant, a subsequent grinding plant and a dust and pollution separation system, according to a reliable and continuous production process. Relicyc entrust to Polplastic (outsourcing) the real production, through injection moulding, of the pallets.

With a 40 year experience Relicyc produces packaging by enhancing secondary raw materials. The organization also presents an environmental management system according to the ISO 14001 standard

(SQS, registration n° H34672, validity from 2023.03.15 to 2026.02.27) and a quality management system according to the ISO 9001 standard (SQS, registration n° H34672, validity from 2023.03.15 to 2026.02.27).

PRODUCT INFORMATION

This Environmental Product Declaration concerns the environmental impacts associated with a model of recycled polypropylene pallet:

Logypal 1®

All these pallets are produced with secondary raw materials (a mix of polypropylene and high density polyethylene). These new plastic pallets are the real alternative to the ISPM-15 treated wooden pallet (HT standard phytosanitary treatment that certifies the suitability of the material to the international regulations drawn up by the IPPC), having a comparable cost, but without the bureaucracy and mandatory certifications for purchase.

These products are also light, resistant, washable and resistant to mold and humidity.

The main characteristics of the model of pallet under study are shown in the following table:

MODEL	Logypal 1
Dimensions [mm] (L x W x H)	1200x800x138
Weight [kg]	4.5
Dynamic load [kg]	800
Static load [kg]	1600
Stackable	yes
Number of pallets for standard stack	62
Stack heigh for lorry [mm]	2610
Weight for stack loaded in lorry [kg]	310

Table 1: Main characteristics of the studied pallet model

The packaging under study are intended to handling and transport of various kind of goods; for this reason falls into the category of «structural packaging» (also known as distribution packaging, transport packaging or tertiary packaging). The company produces fully recyclable packaging and for the collection and recycling activities, the company is registered with CO.N.I.P. ("Consorzio Nazionale Imballaggi Plastica") which, through its consortium members, carries out the operations inherent to this activity.



THE SYSTEM BOUNDARIES

The system boundaries include the entire life cycle of the analyzed product, in accordance with an LCA approach "from cradle-to-grave". The life cycle modules considered within the system boundaries of the present study have been grouped into three stages according to the PCR Packaging. Irrrelevant modules will be marked, in the following table, as "Module Not Declared, MND".

LIFE CYCLE STAGE	LIFE CYCLE STAGE	PRODUCTS COVERED BY THIS EPD
Upstream	A1) Raw material supply	✓
Core	A2) Transport	✓
	A3) Manufacturing	✓
	A4) Transport to forming or filling	✓
	A5) Forming	MND
	B1) Filling operation	MND
Downstream	B2) Distribution of filled packaging	✓
	B3) Transport to reconditioning	MND
	B4) Reconditioning	MND
	B5) Transport to re-filling point	✓
	C1) Disassembling/sorting	MND
	C2) Transport to recovery/disposal	✓
	C3) Final disposal	✓

Table 2: Life cycle stages and modules included within the system boundaries of the examined product

Looking at the previous table:

- **Module A5** is considered as irrilevant because it's included in the Manufacturing phase (module A3)
- **Module B1** is considered as irrilevant because there is not filling of the packaging unit with any kind of matter in any physical state (liquid, solid, or gas)
- **Module B3 and B4** are considered as irrilevant because there aren't operations necessary to restore a reusable packaging to a functional state for further reuse
- **Module C1** is considered as irrilevant because there aren't operations to separate product components

In order to make more understandable the life cycle of the product under study, a simplified scheme of the system boundaries is proposed below.

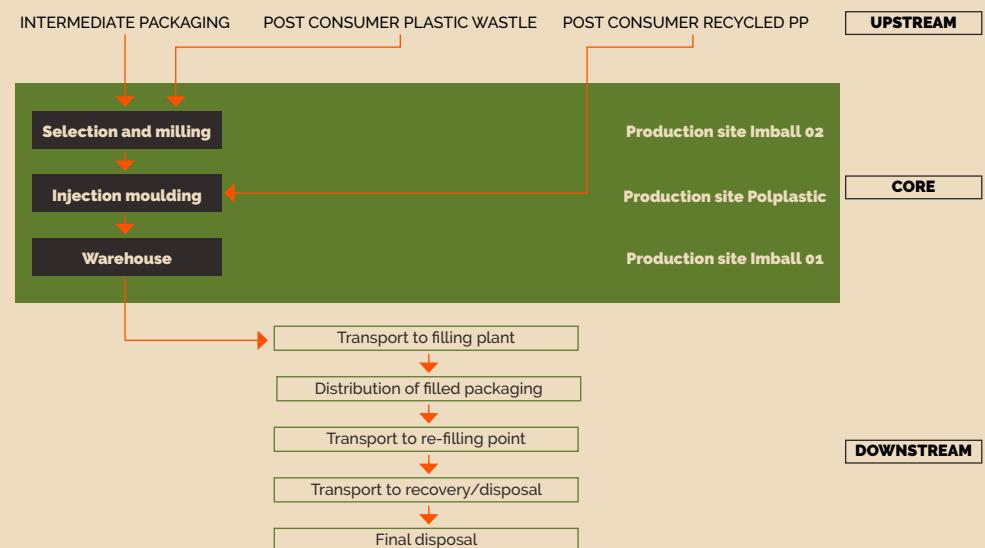


Figure 1: Simplified diagram of system boundaries (energy and auxiliary material flows omitted)

LCA INFORMATION

FUNCTIONAL UNIT: The functional unit is one packaging product unit. The calculated environmental impacts refer to only one reuse of the packaging.

REFERENCE YEAR: 2021.

SOFTWARE: SimaPro v. 9.3.0.2

MAIN DATABASE: Ecoinvent 3.8

ENVIRONMENTAL IMPACTS: The methodology chosen for the assessment of the potential environmental impacts of the products under study was created to include all the impact categories required by the Programme Operator (version 2.0 of 2022-03-29), deriving from the standard EN 15804:2012+A2:2019/AC:2021.

During the production of this model of pallet, process scraps are recovered and reused as material input in the manufacturing process of the same product system.

The manufacturing process of the product, involved in this EPD, is divided into two production companies: Relicyc and Polplastic (outsourcing activity of injection moulding). Primary data from both production companies have been collected and refer to the year 2021.

ALLOCATION PROCEDURES

In the present study it was necessary to apply allocation procedures between co-products in the following cases:

1) Regarding the activities carried out at the Imball 02 plant (where the selection and grinding of the waste takes place) both the ground for direct sale and the ground for the production of pallets are produced simultaneously. Considering that the two flows share all processes, it is appropriate to consider a mass allocation procedure.

2) The following activities are carried out at the Imball 01 plant: warehouse (handling and storage) of plastic and wooden pallets and a joinery for the processing of wooden pallets. In this case we proceeded as follows: wood waste streams generated were excluded as they are entirely attributable to wooden pallets and electricity consumption has been divided according to a physical principle (mass basis); this assumption is precautionary for the plastic pallets as the total allocated also includes the consumption of the joinery.

END-OF-LIFE SCENARIOS AND SOURCES

In the end-of-life scenarios assumed for the pallet under study, the following three disposal processes are considered:

- Recycling with a percentage of 87.29%
- Incineration with a percentage of 5.79%
- Landfill with a percentage of 6.92%

The percentages indicated for each disposal process were obtained from statistics, present in Eurostat, relating to Italy and 2018 (most recent year available), concerning non-hazardous plastic waste.

CALCULATION RULES

In order to carry out this study have been used, if available, primary data; if access to this type of data was not possible, datasets were taken as a reference from the Ecoinvent v3.8 database. Secondary data from Ecoinvent and Eurostat have been used to model:

- The raw material used in the pallet production
- Packaging of the input raw material
- Energy carriers (electricity and natural gas)
- Plant waste and its treatment

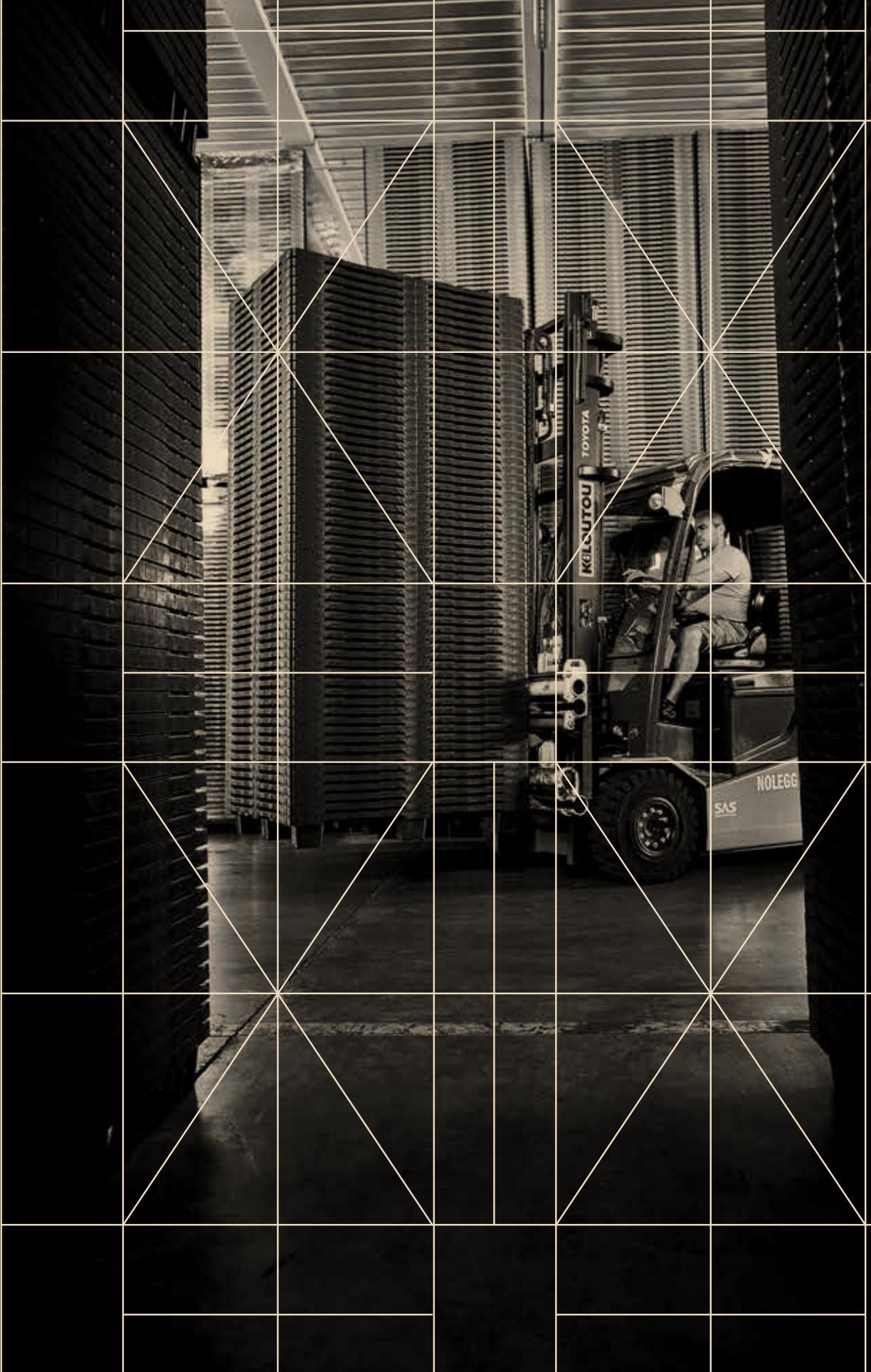
CONTENT DECLARATION

Logypal 1, classified as distribution packaging, is mainly composed (> 99%) of polyolefins and other trace materials. The product under this study has a recycled plastic content of 100% and recycled materials are post-consumer plastic waste.

MATERIALS / CHEMICAL SUBSTANCES	UNIT	%	ENVIRONMENTAL / HAZARDOUS PROPERTIES
Polyolefins	kg	> 99	Substance not classified according to Regulation (EC) No. 1272/2008

Table 3: Content declaration of pallet Logypal 1

The reported recycled content has been taken from certificates issued by the Kiwa certification body (Accr. N.069B). For the product covered by the EPD, the reference certificate is Accr. No. 021/2020 (the certificate dated 26-03-2023 shows a value of 100%, while the certificate dated 04-02-2020 shows a value of 95%).



ENVIRONMENTAL PERFORMANCE

PARAMETER		UNIT	UPSTREAM	CORE	DOWNTREAM	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	5.73E-04	2,41E+00	2,14E+00	4,54E+00
	Biogenic	kg CO ₂ eq.	-3,22E-03	6,61E-02	3,94E-03	6,68E-02
	Land use and land transformation	kg CO ₂ eq.	2,41E-06	5,16E-04	5,85E-04	1,10E-03
	TOTAL	kg CO ₂ eq.	-2,65E-03	2,47E+00	2,14E+00	4,61E+00
Acidification potential (AP)		kg mol H ⁺ eq.	3,33E-06	1,13E-02	8,14E-03	1,94E-02
Eutrophication potential (EP)	Aquatic freshwater	kg P eq.	1,80E-07	3,98E-04	9,75E-05	4,96E-04
	Aquatic marine	kg N eq.	9,17E-07	1,91E-03	3,05E-03	4,97E-03
	Aquatic terrestrial	mol N eq.	1,01E-05	2,08E-02	3,21E-02	5,30E-02
Photochemical oxidant creation potential		kg NMVOC eq.	2,61E-06	6,00E-03	7,81E-03	1,38E-02
Ozone layer depletion		kg CFC 11 eq.	7,68E-11	5,46E-07	3,39E-07	8,84E-07
Abiotic depletion potential (ADP)	Metals and minerals	kg Sb eq.	4,54E-09	1,05E-05	4,84E-06	1,54E-05
	Fossil resources	MJ	1,14E-02	4,76E+01	2,22E+01	6,98E+01
Water deprivation potential (WDP)		m ³ depriv.	3,32E-04	1,71E+00	7,11E-02	1,78E+00

Table 4: Results, broken down by modules, of the potential environmental impact assessment of the examined product

PARAMETER		UNIT	UPSTREAM	CORE	DOWNTREAM	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value.	3,51E-04	1,07E+00	2,44E-01	1,31E+00
	Used as raw materials	MJ, net calorific value.	3,89E-02	3,88E-01	7,79E-02	5,05E-01
	TOTAL	MJ, net calorific value.	3,93E-02	1,46E+00	3,22E-01	1,82E+00
Primary energy resources - Non renewable	Use as energy carrier	MJ, net calorific value.	9,72E-03	4,76E+01	2,22E+01	6,98E+01
	Used as raw materials	MJ, net calorific value.	1,72E-03	0,00E+00	0,00E+00	1,72E-03
	TOTAL	MJ, net calorific value.	1,14E-02	4,76E+01	2,22E+01	6,98E+01

Table 5: Results, broken down by modules, of resources use of the examined product

ADDITIONAL INFORMATION

In accordance with §4.1.2 of the reference PCR "An optional additional functional unit may be used, taking into consideration the quantity of volume transported in the life cycle of the packaging and should be declared as total volume or its units. The number of reuse and the total volume considered shall be declared in the EPD". For this reason, within this EPD results will also be expressed in terms of volume contained under the following conditions:

- Only one use of the plastic pallet is precautionary considered
- An occupied volume equal to the maximum pallet area and load height of one meter is assumed. This results in a volume of 0,960 m³
- A load density of 833 kg/m is assumed, so as to achieve the maximum dynamic load of 800 kg

In this way, the optional functional unit can be expressed as the transport of 1 m³ under the conditions described above.

This leads to a reference flow of 0,96 pallet units; the results of the potential environmental impact assessment with respect to this reference flow will be reported in the tables below:



PARAMETER		UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	5.50E-04	2,31E+00	2,05E+00	4,36E+00
	Biogenic	kg CO ₂ eq.	-3,09E-03	6,34E-02	3,78E-03	6,41E-02
	Land use and land transformation	kg CO ₂ eq.	2,31E-06	4,95E-04	5,62E-04	1,06E-03
	TOTAL	kg CO ₂ eq.	-2,54E-03	2,37E+00	2,05E+00	4,43E+00
Acidification potential (AP)		kg mol H* eq.	3,20E-06	1,08E-02	7,81E-03	1,86E-02
Eutrophication potential (EP)	Aquatic freshwater	kg P eq.	1,73E-07	3,82E-04	9,36E-05	4,76E-04
	Aquatic marine	kg N eq.	8,80E-07	1,84E-03	2,93E-03	4,77E-03
	Aquatic terrestrial	mol N eq.	9,69E-06	2,00E-02	3,08E-02	5,08E-02
Photochemical oxidant creation potential		kg NMVOC eq.	2,50E-06	5,76E-03	7,50E-03	1,33E-02
Ozone layer depletion		kg CFC 11 eq.	7,37E-11	5,24E-07	3,25E-07	8,49E-07
Abiotic depletion potential (ADP)	Metals and minerals	kg Sb eq.	4,36E-09	1,01E-05	4,65E-06	1,48E-05
	Fossil resources	MJ	1,10E-02	4,57E+01	2,13E+01	6,70E+01
Water deprivation potential (WDP)		m ³ depriv.	3,19E-04	1,64E+00	6,82E-02	1,71E+00

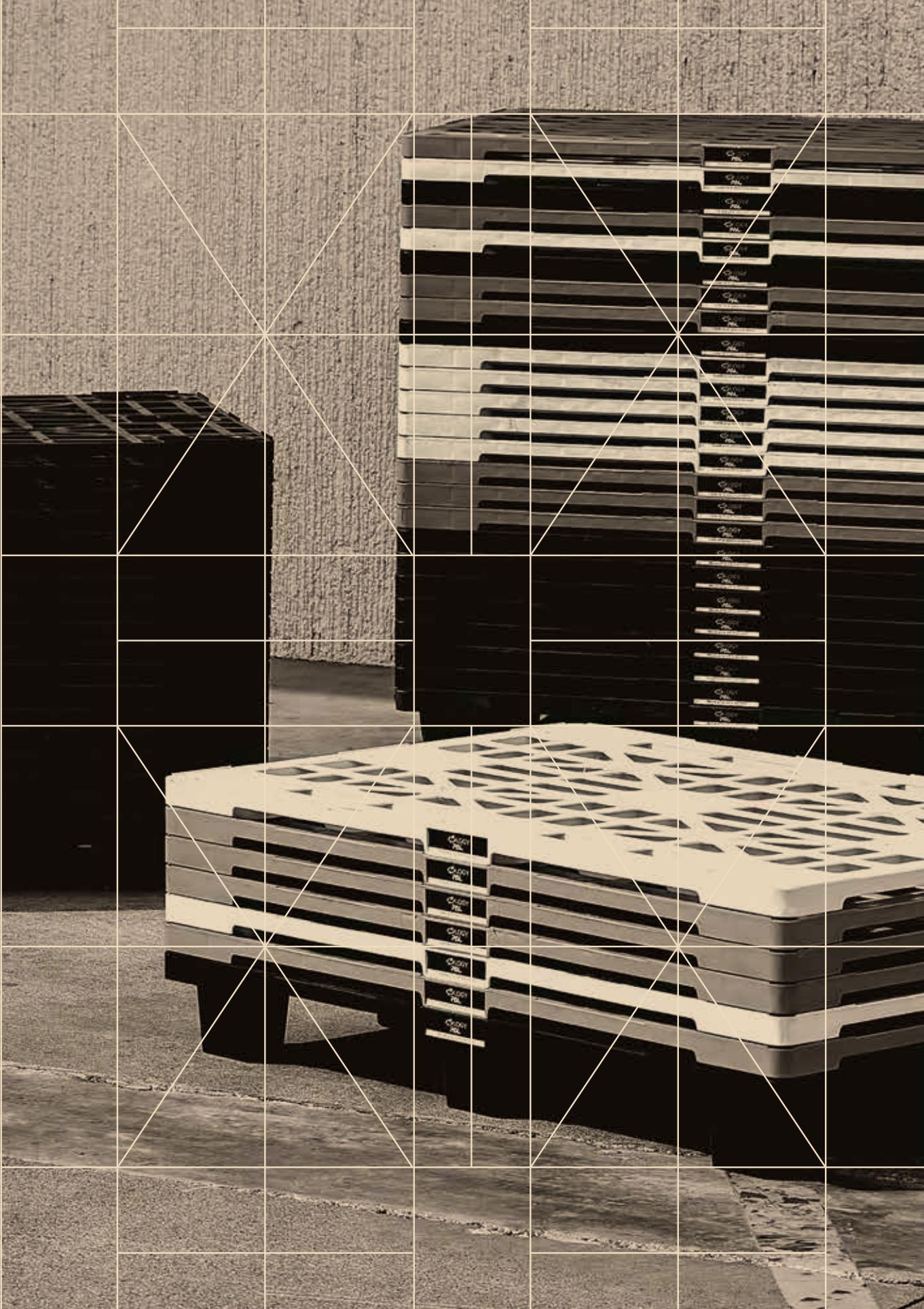
Table 6: Results, broken down by modules, of the potential environmental impact assessment of the examined product and referred to the alternative functional unit

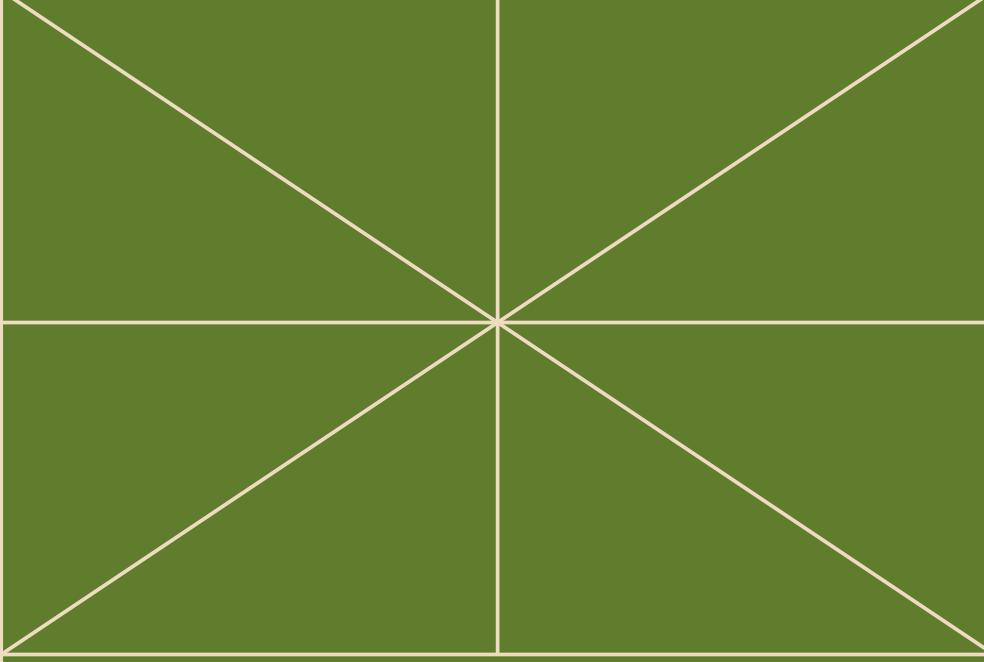
PARAMETER		UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	3,37E-04	1,02E+00	2,34E-01	1,26E+00
	Used as raw materials	MJ, net calorific value	3,74E-02	3,72E-01	7,48E-02	4,85E-01
	TOTAL	MJ, net calorific value	3,77E-02	1,40E+00	3,09E-01	1,74E+00
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	9,33E-03	4,57E+01	2,13E+01	6,70E+01
	Used as raw materials	MJ, net calorific value	1,65E-03	0,00E+00	0,00E+00	1,65E-03
	TOTAL	MJ, net calorific value	1,10E-02	4,57E+01	2,13E+01	6,70E+01

Table 7: Results, broken down by modules, of resources use of the examined product and referred to the alternative functional unit

REFERENCES

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