



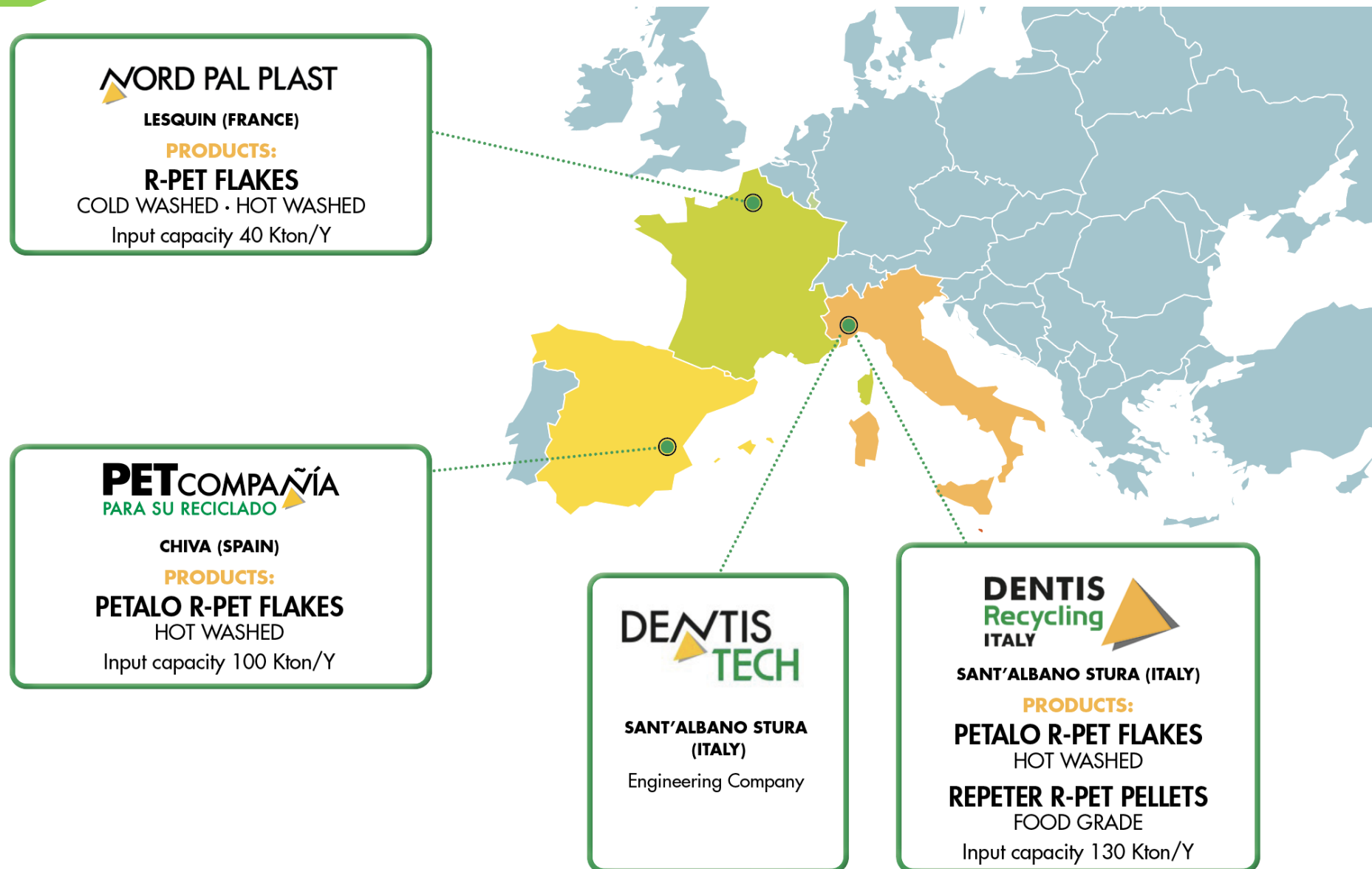
LCA nella strategia aziendale per la produzione di R-PET

Corrado Dentis

Amministratore Delegato

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Dentis: dove siamo



Dentis: Il Gruppo oggi



Dentis Group at “a glance”



Turnover in 2023 > 120 M€



More than 200 employees in three production plants



Input: Over >200 Kton/y bottles PET bottles processed



Output: Over >130 Kton/y of R-PET produced

ISO 14001 9001 and 28000 certified



Product certification



EuCertPlast



La Guerra infinita contro la plastica



Sebastian Lamp – Petcore Conference 2020

Chi vincerà?



Sustainability check!

WHAT IS MORE ECO?



paper



glass



aluminium



plastic

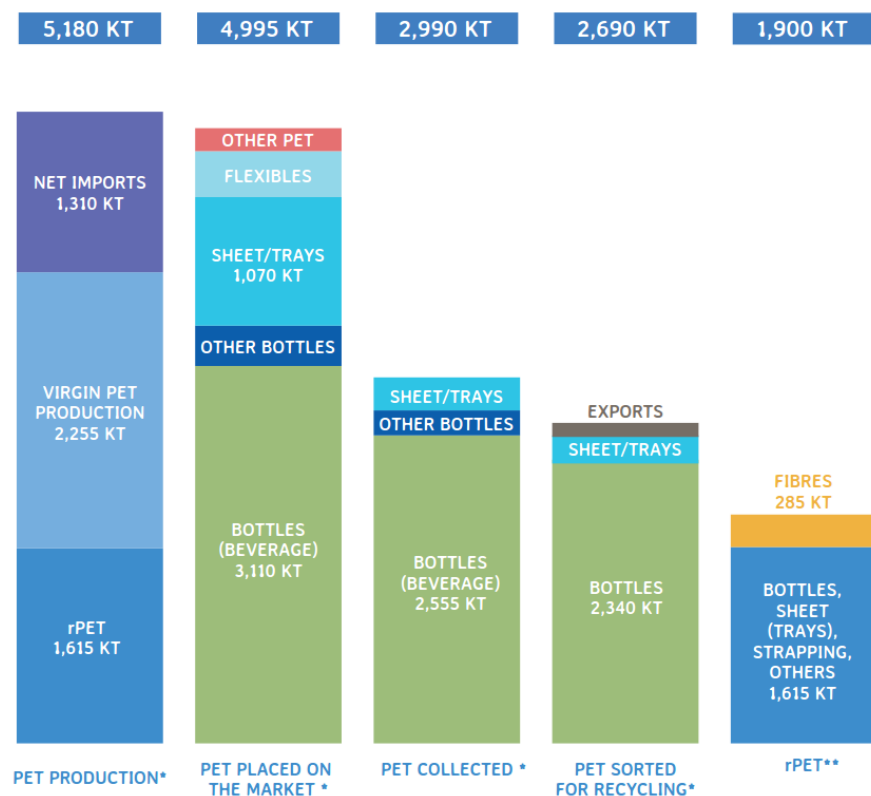


ourgoodbrands



Il PET: bilancio di massa EU 2022

EUROPEAN PET MARKET FLOW IN 2022



An estimated of 5.1 mt of PET **rigid packaging** ended its cycle-life and available for collection in 2022:



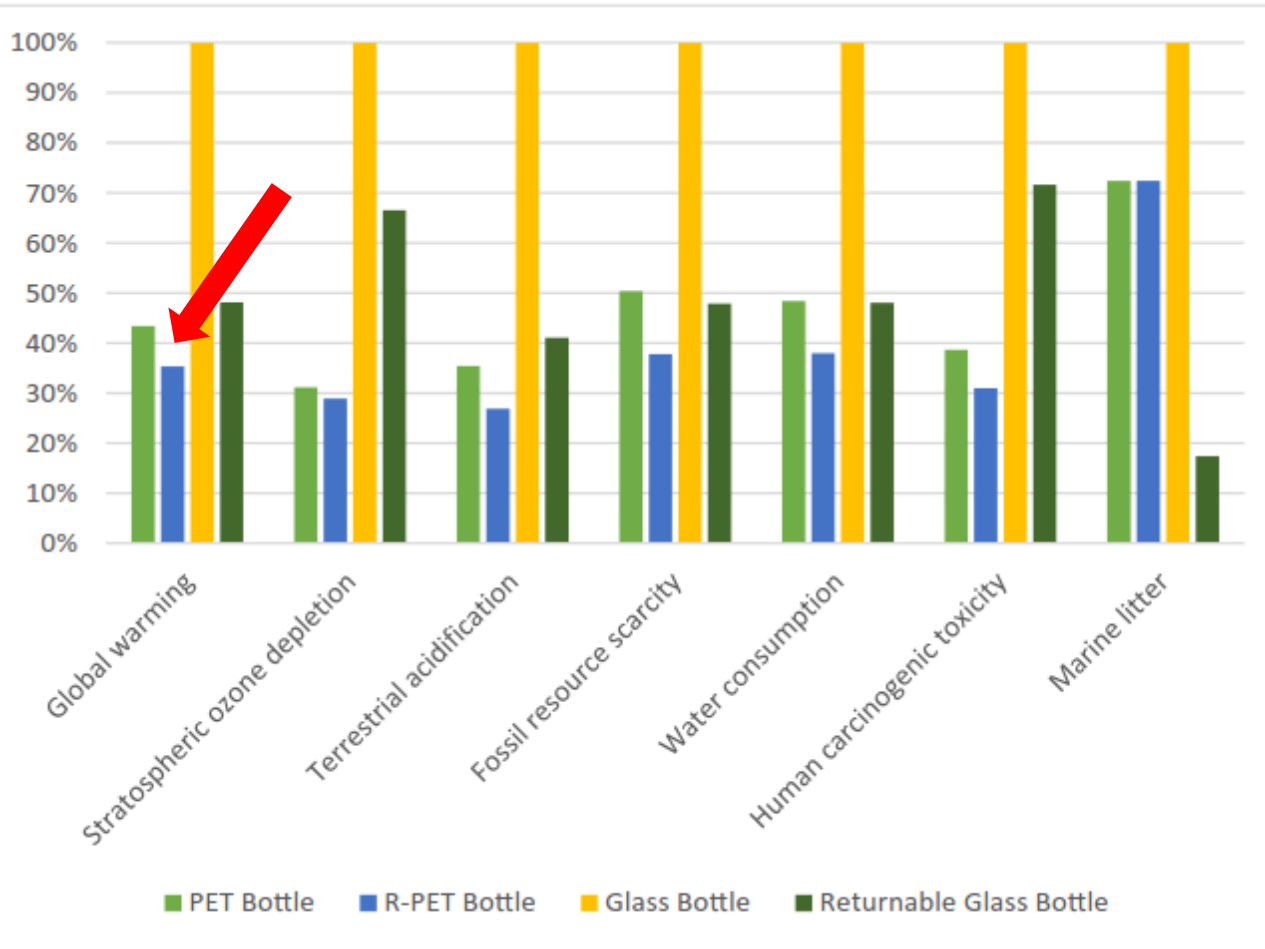
PET Amount for recycling 2,99 mt
(58% of PET placed on market)

2,3 mt (on 3,1 mt on market)
74 % for PET bottles

300 kt (on 1,0 mt on market)
~30 % for PET trays (diluted in PET bottle Streams)

1,90 Mtons rPET production

Plastica vs Vetro: il Caso di studio di una Bottiglia di 1L Latte



Life Cycle Assessment with "cradle to grave" approach

- ✓ PET Bottle
- ✓ R-PET Bottle (50% R-PET)
- ✓ Glass Bottle
- ✓ Returnable Glass Bottle (8 cycles)

**Plastic or glass: a new environmental assessment with a marine litter indicator for the comparison of pasteurized milk bottles, Vignali et al, Int. J. of Life Cycle Assessment, 2020.*

L'importanza della valutazione dei dati LCA

LCA analysis: The Carbon fingerprint in comparison



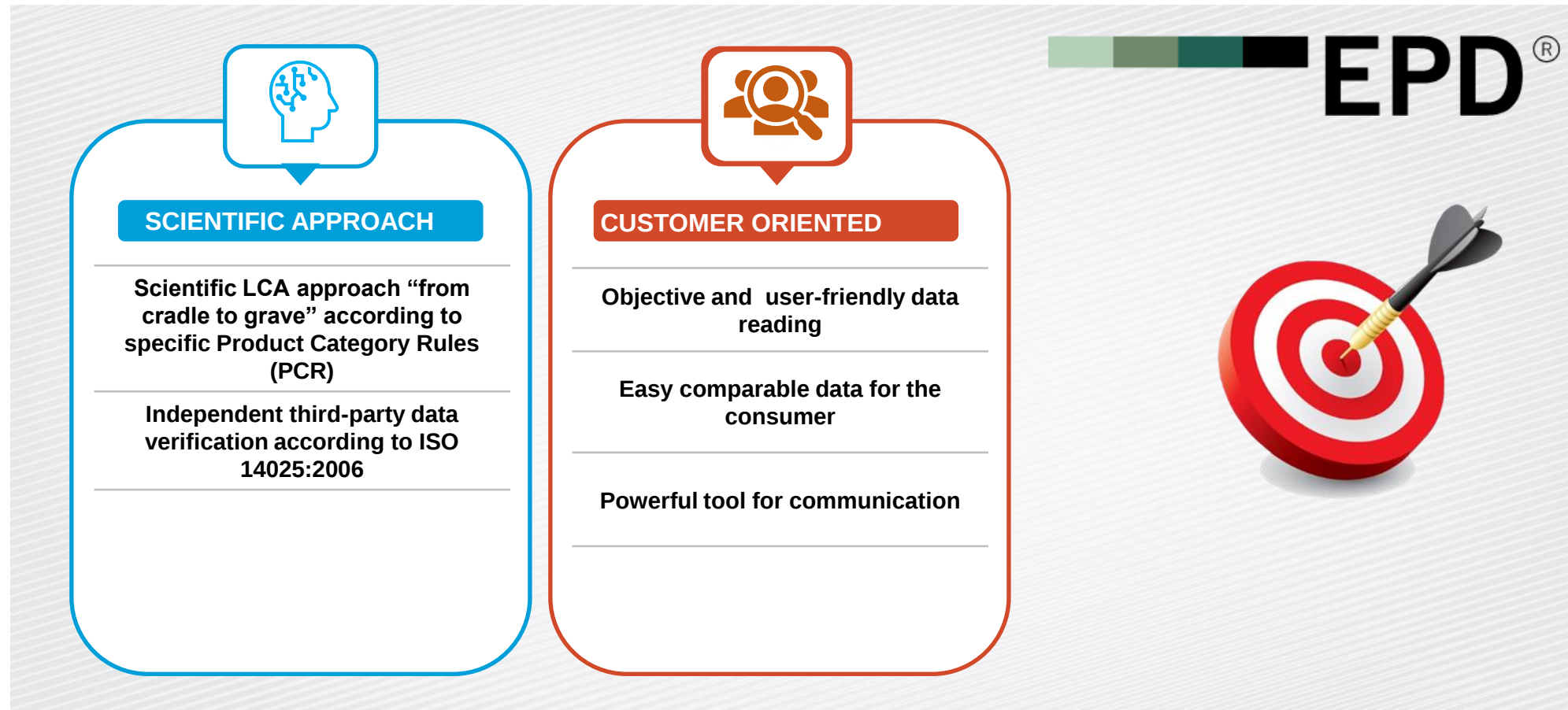
Plastic has a lower carbon footprint than other traditional materials

It's urgent to build messages that go beyond those who are already aware of PET and its attributes!!

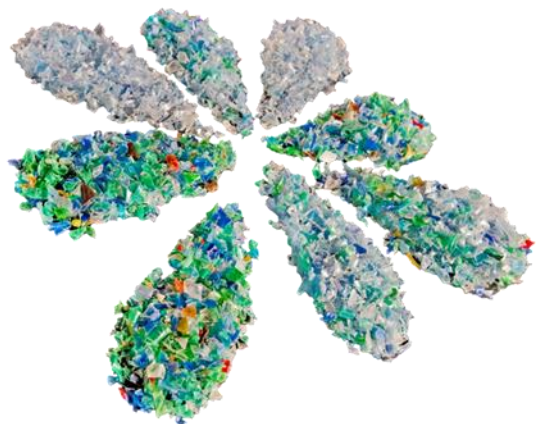
**Examining material evidence the carbon fingerprint, Imperial College of London (UK), 2020*

Il ruolo dell' RPET nella riduzione dell'impronta di CO₂

To send message beyond PET specialist walls a reliable and objective model is mandatory !!



Dentis: Dichiarazione Ambientale di Prodotto di PETALO



The study has been conducted by **Valentina Castellani** for Dentis Recycling Italy S.r.l.



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 for:

PLASTIC WASTE AND SCRAP RECYCLING
from **DENTIS RECYCLING ITALY S.R.L.**



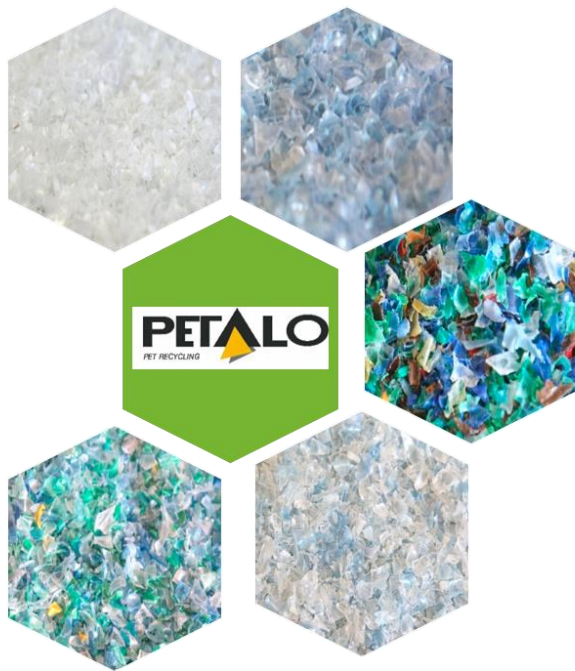
Programme	The International EPD® System www.environdec.com
Programme operator	EPD International AB
EPD registration number	S-P-02594
Publication date	2021-03-11
Valid until	2026-01-31

<https://environdec.com/library/epd2594>

Look up at EPD library for *DENTIS*
in the filter field

Dentis: Dichiarazione Ambientale di Prodotto di PETALO

- Flagship product of the group Dentis, **PETALO**, available in different colored shades, is distinguished for its special microstructure (partially crystallized) and for the low presence of contaminants: **60 ppm**
 - High quality down **to 20 ppm contaminant content**

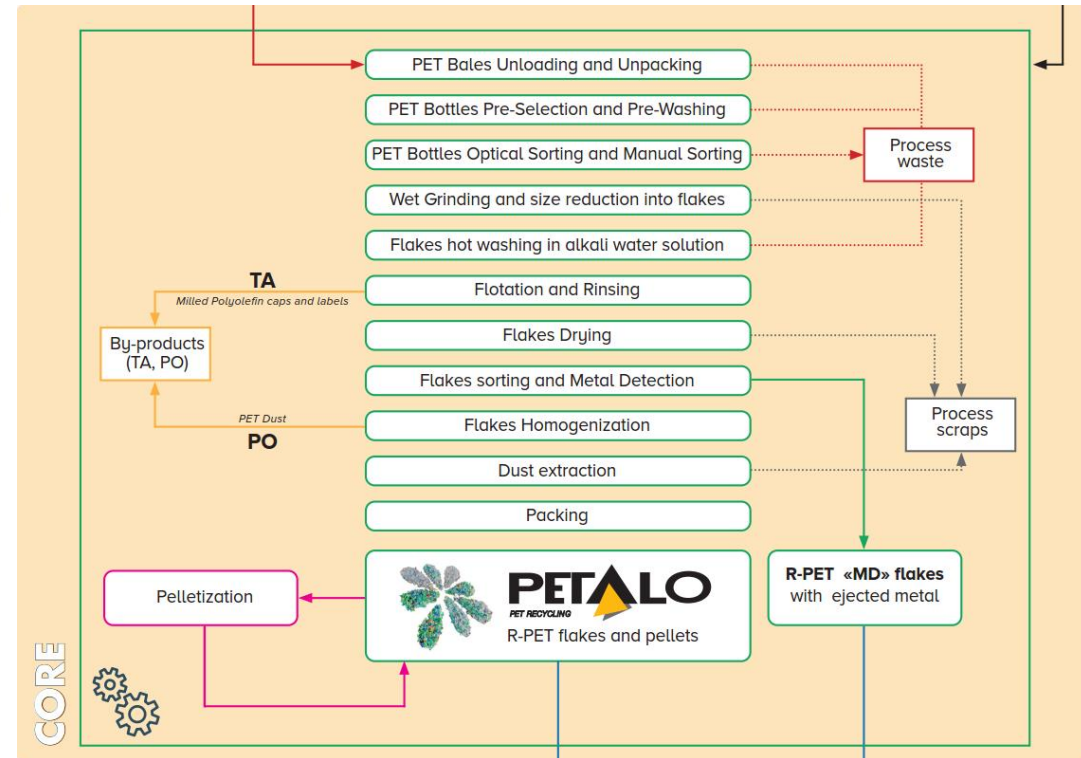


Parameter	PETALO high quality	PETALO first choice
Origin of the material	100% Post consumer PET bottles	
Moisture Content (%)	≤ 0.6	≤ 0.6
Bulk Density (g/m³)	≥ 300	≥ 300
Intrinsic Viscosity (dl/g)	0,72 ± 0.02	0,72 ± 0.02
Flakes distribution (mm)	0.6 – 8.0	0.6 – 8.0
Contaminants (ppm)		
PVC content	-	≤ 30
Polyolefin content	-	≤ 10
Metal content	≤ 5	≤ 10
Paper/Cellulose content	Absent	Absent
Other contaminants	-	≤ 10
Inert (glass, wood..) content	Absent	Absent
Max Total Contaminants	≤ 20	≤ 60

I criteri di valutazione dell'EPD

Core activities

- Activities at Dentis Recycling Italy production site:
 - Unloading and unpacking of PET plastic waste bales
 - Preliminary selection of PET materials through sieving of materials from unpacked bales
 - PET containers pre-washing with hot water
 - PET containers sorting (automatic and manual)
 - Wet grinding (to transform PET containers into flakes)
 - Flakes hot washing in alkali water solution
 - Separation of polyolefin caps by flotation
 - Flakes drying
 - Flakes automatic sorting (based on their quality) and metal detection
 - Flakes homogenization
 - Dust extraction
 - Packing in big-bags



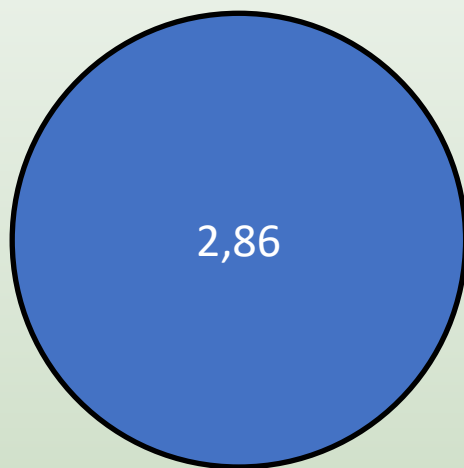
Impronta Ambientale di RPET PETALO® vs PET Fossile

PARAMETER		UNIT	R-PET PETALO	VIRGIN PET
Global warming Potential (GWP)	Fossil	kg CO ₂ eq.	1.08	2.86
	Biogenic	kg CO ₂ eq.	0.07	0.004
	Land use and land transformation	kg CO ₂ eq.	0.001	0.002
	TOTAL	kg CO ₂ eq.	1.15	2.86
Acidification potential (AP)		kg SO ₂ eq.	0.004	0.01
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.	0.001	0.003
Photochemical oxidation potential (POCP)		kg NMVOC eq	0.004	0.01
Abiotic depletion potential Elements		kg Sb eq.	0.00001	0.0004
Abiotic depletion potential Fossil resources		MJ, net calorific value	15.57	65.61
Water scarcity potential		m ³ eq.	0.18	1.34

Impact of 1 kg of virgin PET pellets has been calculated using the Ecoinvent dataset "Polyethylene terephthalate, granulate, bottle grade {GLO}| market for | Cut-off", representing the average virgin PET pellets available on the European market.

Impronta Ambientale di RPET PETALO® vs PET Fossile

The Carbon Footprint (Kg CO₂ eq.)



Virgin PET



R-PET PETALO

Less than **60%** of
greenhouse emission
for R-PET PETALO

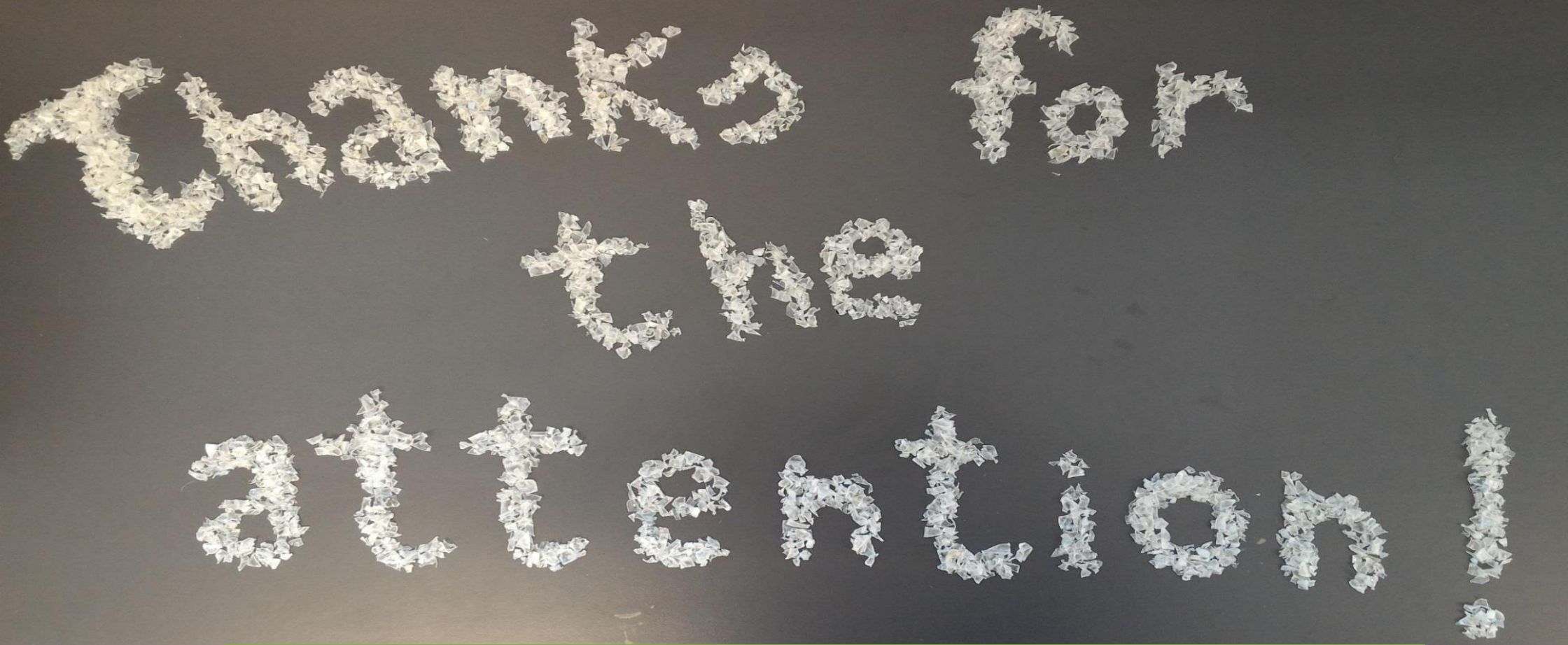


Conclusioni

- ▶ PET is not only a suitable technical resin for packaging, but it can be part of the solution of the emission issues
- ▶ Better than PET is R-PET in terms of reducing Carbon Footprint —————> Urgent to boost PET Recycling market
- ▶ It's mandatory to build messages that can go beyond the PET wall specialists
- ▶ Necessary a clear and objective data model that can be user-friendly for the consumer



Dentis is proud to be one among the first in the market to be accomplished **an EPD declaration** about R-PET reporting clear data on reducing carbon footprint compared to virgin PET!



***PET COMPAÑÍA PARA
SU RECICLADO***

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