



CARBIOS

Enzymes powering the Circular Economy

Corporate presentation

January 2023



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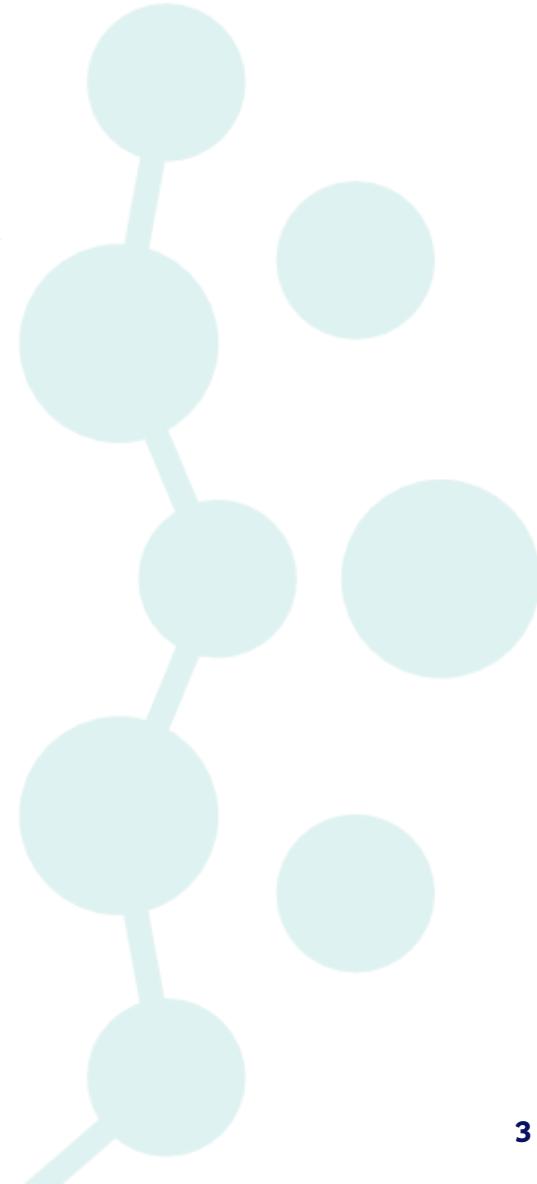
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Carbios, the first and only company to rethink the life-cycle of plastics and textiles with biological technologies



Founded
in **2011**



51 patent
families

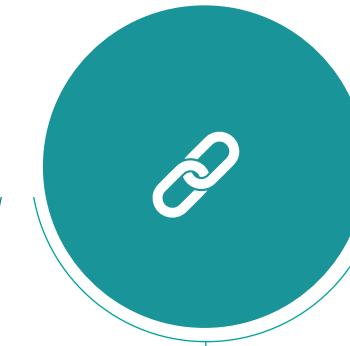


105
employees
including 2/3
dedicated to RDI

47% Women
53% Men



Multi-sources
revenue business model



Exclusive
partnerships





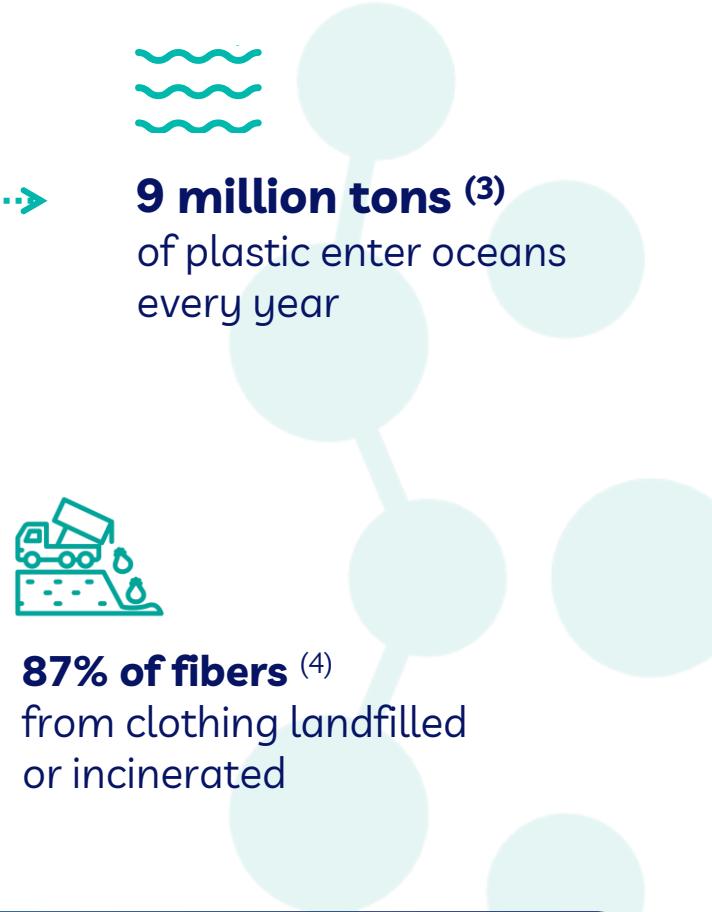
How do we fix this?



460 million tons⁽¹⁾
of plastic produced every
year and **only 14% is**
recycled globally⁽²⁾



39 million tons⁽¹⁾
of textile fiber waste



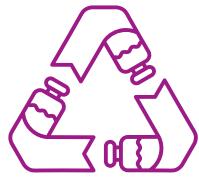
Carbios is best positioned to deliver concrete and sustainable solution to tackle this emergency.



Mission

Lead the transition towards sustainable plastics economy by developing technologies for the end-of-life of plastics

CARBIOS AMBITION



Become the world leader in PET recycling by 2035 and increase our pipeline of eco-friendly technologies



Provide the most sustainable and most circular solutions for the end-of-life of plastics and textiles



Become the best employer of its category
–
The best place to work



Carbios' disruptive solutions: industrial processes for the recycling and the biodegradation of multiple kinds of plastics

Two disruptive solutions reaching industrial and commercial scale:



- BIORECYCLING
PET



- BIODEGRADATION
PLA

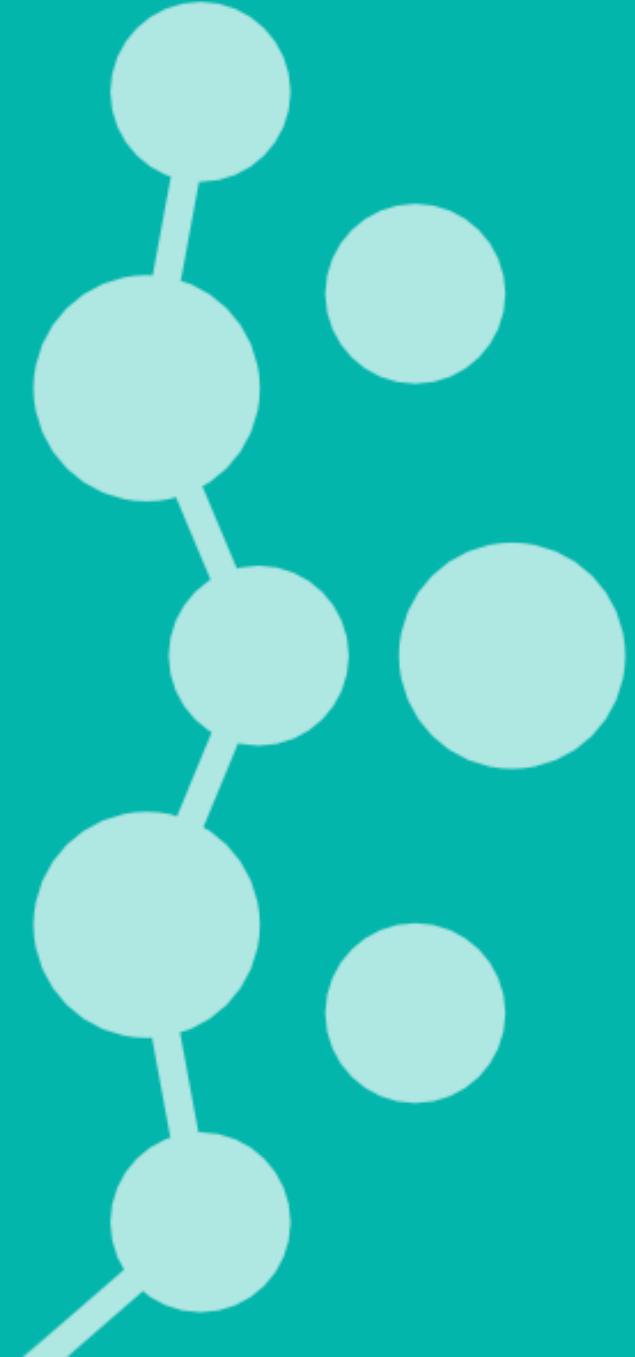
Ongoing research to bring an extensive portfolio of technologies to the market.



- INNOVATION
on other polymers

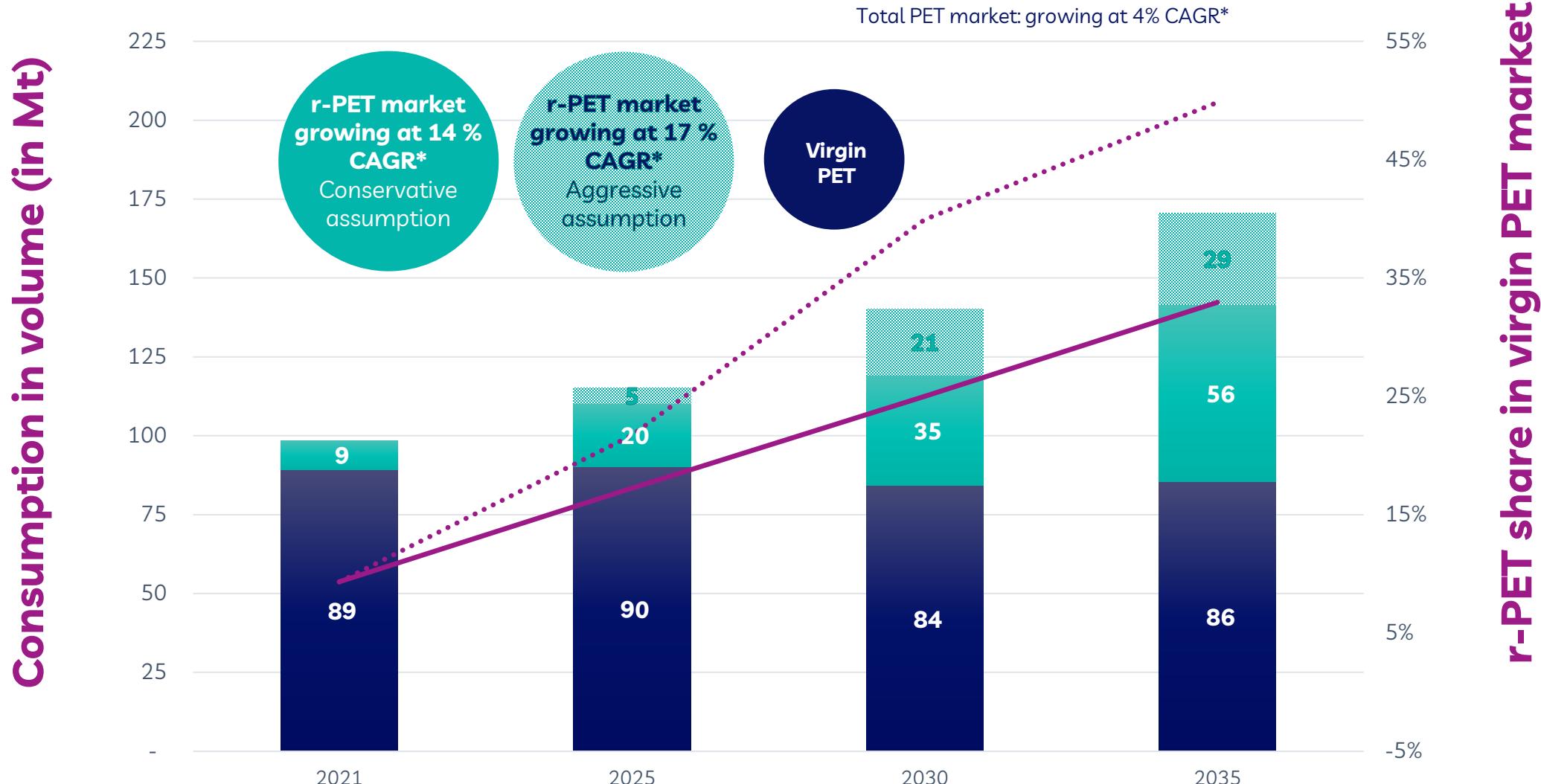


**A booming market for
recycled PET with a strong
unbalanced Supply / Demand**





Recycled PET, a booming and unbalanced market

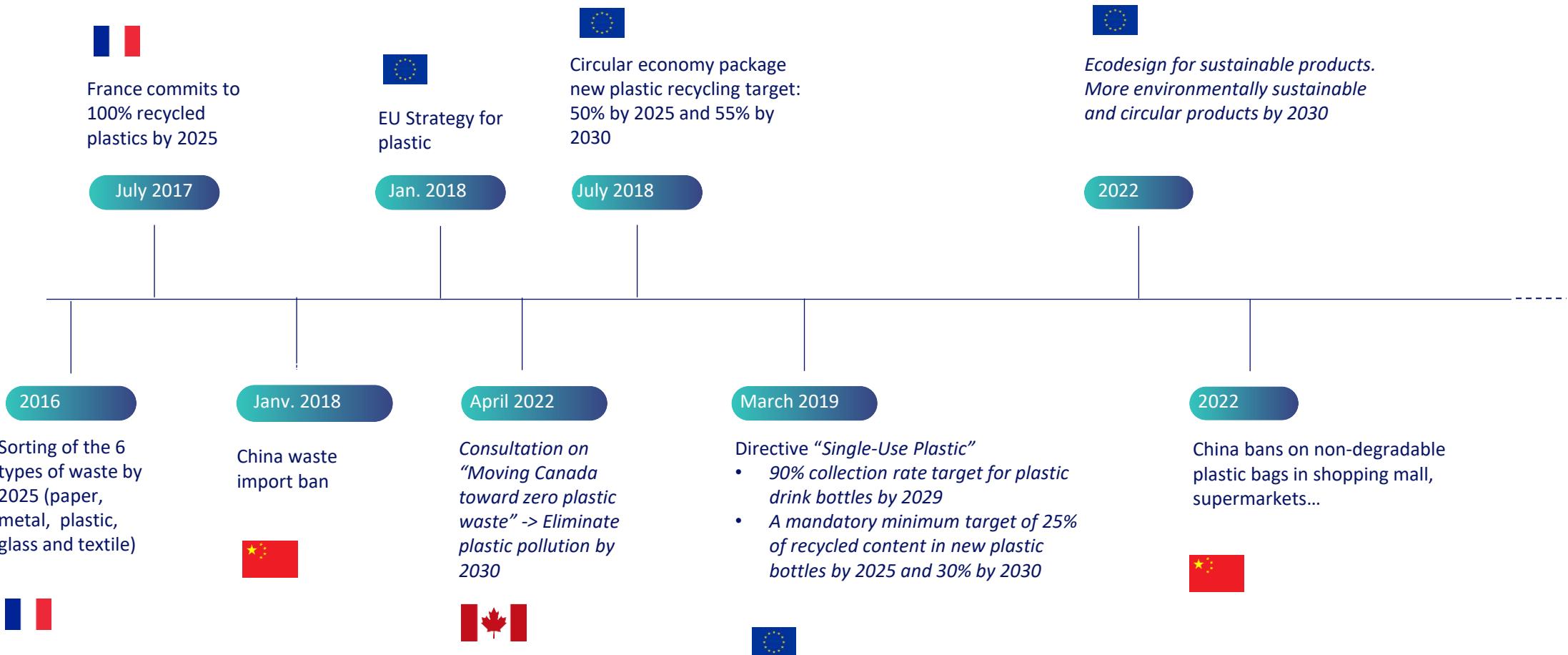


Sources*: Carbios assumptions, IHS Markit in 2021, Market Research Future in 2021 and KPC in 2022



... Supported by more and more regulations

In France and around the world





... Pulled by Brands' commitments



Packaging: strong drivers for sustainable solutions



Apparel & Sportswear demand

Addressable markets



■ PET Plastics ■ PET polyester fibers

Nov. 2018: "By 2025, 50% of plastic used in our packaging will be recycled or bio-sourced" and "by 2025, 100% of our plastic packaging will be refillable, reusable, recyclable or compostable"

Jan. 2019: "Nestlé Waters will increase the recycled PET content in its bottles to 35% by 2025"

Oct. 2016: "Design 100% of its packaging to be recyclable, compostable or biodegradable by 2025"

Sept. 2019: "Our ambition? Offer 100% sustainable plastic bottles made from recycled or bio-sourced materials for our entire beverage portfolio."

L'ORÉAL
PARIS



PEPSICO



patagonia®

SALOMON

"Polyester is the material we use more than any other. To reduce the environmental footprint associated with our use of this performance fabric, we are working to phase out virgin polyester and polyamide and use only 100% recycled Polyester (rPES)"

2021: "As part of our 10FOR25 targets, PUMA has committed to scaling up the usage of recycled polyester to 75% by 2025. In 2021, we used 43% recycled polyester across all product categories."

"For the Fall 2022 season, 91% of our polyester fabrics are made with recycled polyester. As a result of not using virgin polyester, we avoided more than 12.3 million pounds of CO₂e being emitted into the atmosphere."

Feb. 2019: "The concept for a fully recyclable running shoe is the first step in Salomon's commitment to have 100 percent of its new products designed to one or several of the company's circular economy principles by 2025."



... and consumers' request for change

US & EUR consumers feel concerned, helpless and expect stakeholders to take actions



quote for **plastic pollution** as main environmental issue after climate change and ocean pollution



of consumers doubt about the actual **recycling process**



only think that plastic contained in **textiles & clothes** could also be recycled

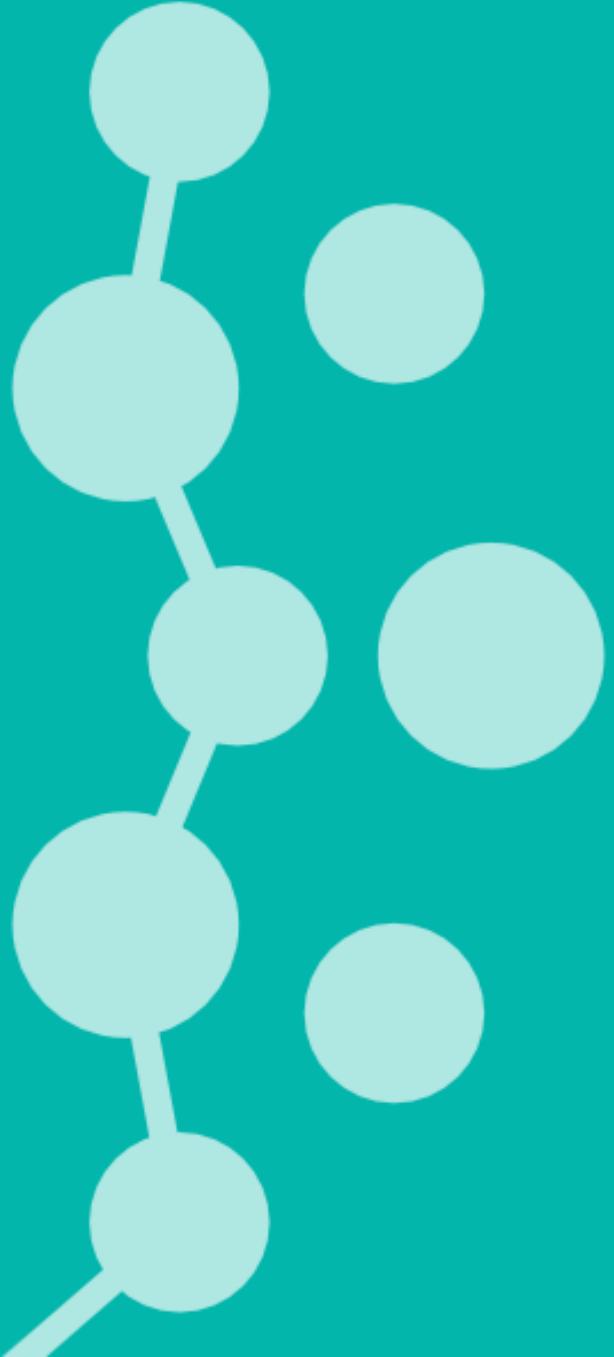


think plastic cannot be **recycled more than 5 to 10 times**

Source: Strategic Research institute , April 2022



**Carbios solution: a novel
industrial approach to drastically
improve the way we recycle PET
plastics and textiles**





Enzymatic recycling technology

A **KEY STEP** TOWARDS BUILDING A
FIRST OF A KIND **RECYCLING FACILITY**



Technical data
generation



Main parameters
definition for each step
of the enzymatic recycling
process



Future industrial
unit operations
planification



Fully operational
Process Design
Package (PDP)

Engineering and construction carried out in partnership with



Carbios' journey towards industrialization



SCIENTIFIC VALIDATION

Publication in Nature¹, in April 2020, co-authored by Carbios' CSO together with **scientists from Carbios** and the **Toulouse Biotechnology Institute**.

¹ Vol 580, 9 April 2020



MARKET VALIDATION

Our 4 **brand-owners partners¹**, have presented in June 2021 one of their packaging manufactured in industrial conditions, **made with product coming from our technology**, food-contact approved.

¹L'Oréal, Nestlé Waters, PepsiCo and Suntory Beverage and Food Europe)



INDUSTRIAL VALIDATION

Start-up of our demonstration plant in Clermont-Ferrand, end of September 2021.

Granting licenses as of 2023



INDUSTRIALIZATION

Start-up of a **first-of-a-kind industrial unit** (the reference plant) beginning of 2025.

Successful **capital increase** of €114 million in May 2021.



Engineered enzyme providing an efficient route to recycle and reuse PET

Carbios aims to offer the most circular process for the recycling of PET by enabling:



**The treatment of
any kind of PET
waste**

↑
upcycling low-value
feedstocks



**Creating value from
waste which is not
recycled today**

↑
avoiding incineration
and landfill



**Lowering
CO₂
emissions**

↑
low energy
consumption and
proximity sourcing

Circular Economy is becoming a reality!



Carbios aims to develop a highly sustainable process for PET life-cycle



46% CO₂ potential savings

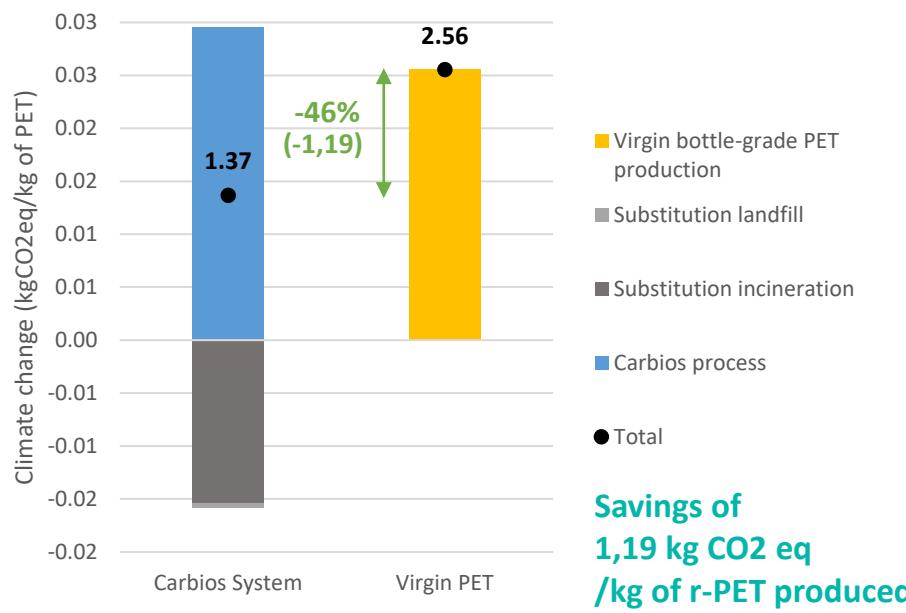


Low temperature,
no pressure



No solvents

LIFE CYCLE ASSESSMENT



- 50kt processing capacity plant ⇔ 45kt of CO₂ eq. would be potentially saved annually
 - > Compared to virgin PET production, taking into account diversion of PET waste from a conventional end-of-life



The demo plant has confirmed scale-up performance and robustness



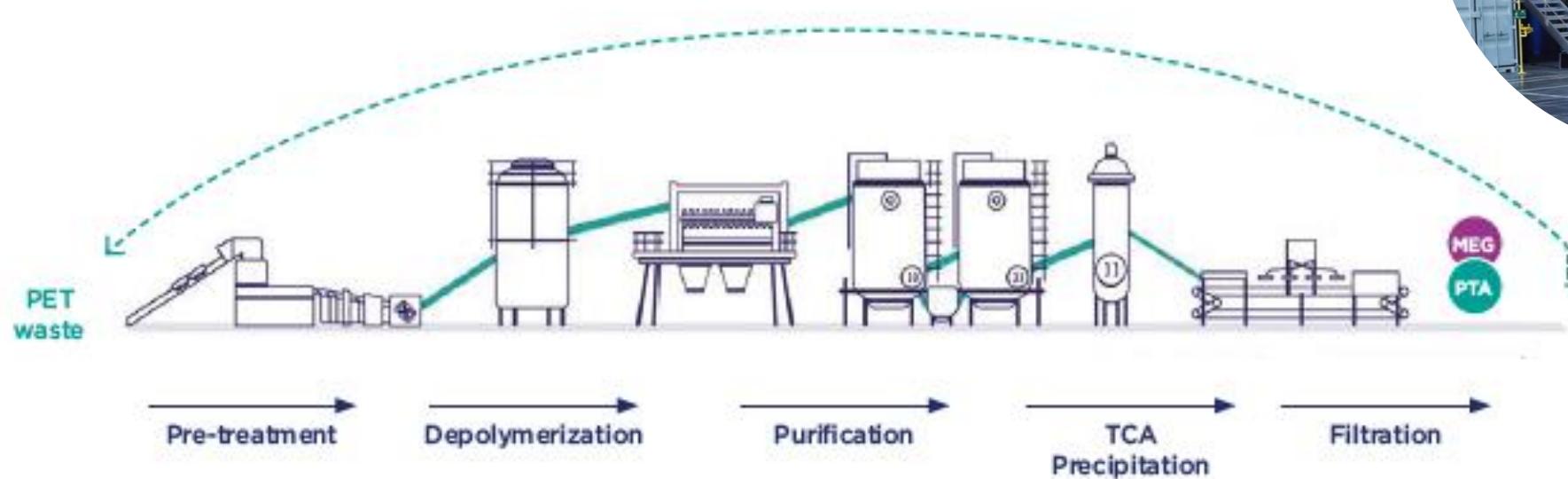
Enzymatic reaction kinetics and PET conversion: no impact of scale



Low sensitivity to process conditions:
Robust!



Monomer of virgin-like quality
Sampled with positive feedback from potential end-users



Modeling of the main stages of the process of depolymerization of PET plastic and textile waste into monomers, as used at the industrial demonstration plant



The demonstration plant, last step before commercial scale

Enzyme identification & enzymatic engineering

Picoliter - Microliter

Process scale-up



Reactor: 250 ml to 5 liters

Pilot



Reactor: 1 M³

1. All process steps
2. Parametric studies
3. Technology scouting and selection

Demonstration plant



Reactor: 20 M³



1. SCOPE : Comprehensive : all steps, interlinked

2. QUALITY : Tests on different waste streams, critical parameters product quality

3. DATA ACQUISITION : for the Process Design Package of commercial plants

4. PEOPLE : Develop know-how

Licensing as of 2023



International deployment

Commercial unit

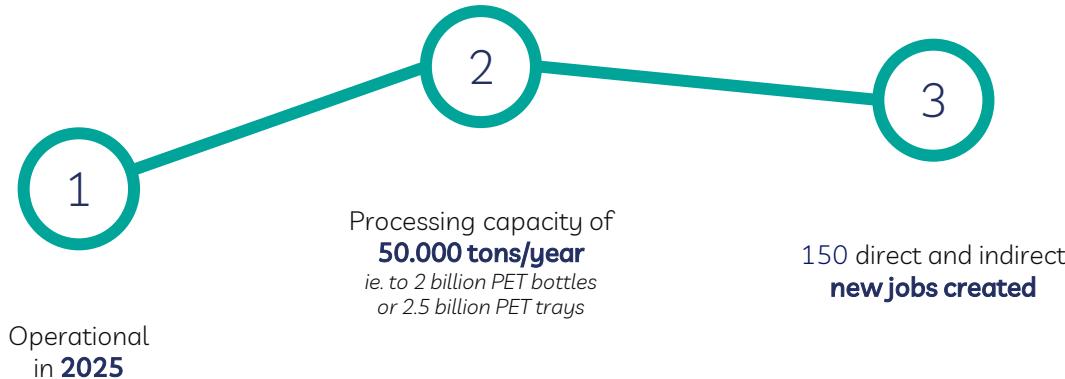


Reactors: 1200 m³

The building of a first of a kind 100% PET biorecycling plant



KEY FIGURES



A GLOBAL PARTNER

INDORAMA
VENTURES



One of the world-leading PET manufacturer



Operates 19 PET production plants on 4 continents in 11 countries



Plans to co-invest in this project



Consider expanding Carbios' technology at other PET sites for future developments



Project of the first-of-a-kind plant

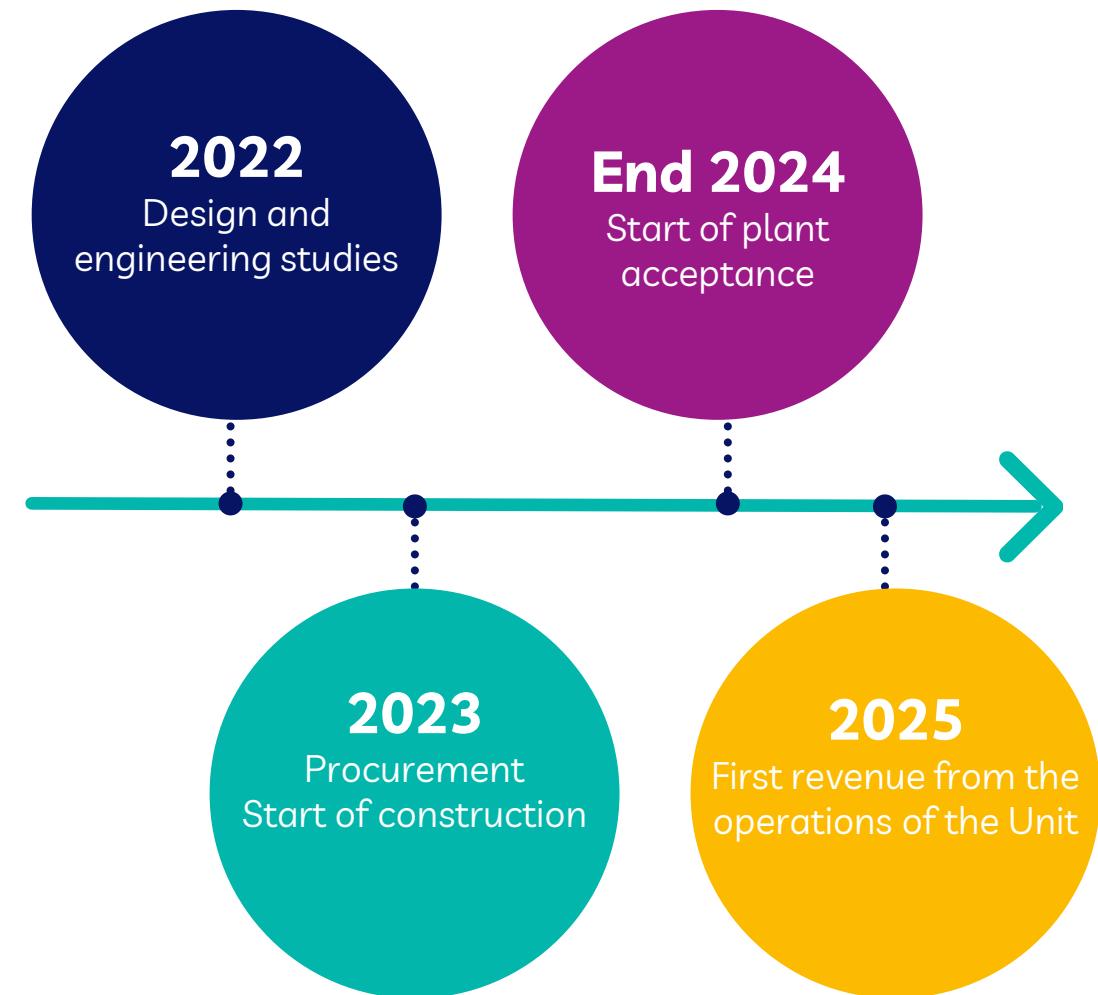
Key figures:

- Operational in Q1 2025
- Processing capacity of 50.000 tons of waste/year
 - ie. to 2 billion PET bottles
- 150 direct and indirect new jobs created

A major partner: **INDORAMA** VENTURES

- One of the world-leading PET manufacturer
- Operates 19 PET production plants on four continents in 11 countries
- May co-invest in this project
- Consider expanding Carbios' technology at other PET sites for future developments

Key timetable for the building of the Unit





2025: preliminary plot and layout





Parallel and synchronized activities preparing for licensing...

supported with the development of the industrial team

First of a kind plant



Demoplant design and operations



Worldwide technology licensing





Carbios' business model: three streams of revenues



novozyymes®
Rethink Tomorrow



*under definition – to be precised in the near future



Our key partners

Our PET Consortium

L'ORÉAL



 PEPSICO

 SUNTORY
BEVERAGE & FOOD EUROPE

Our textile Consortium



patagonia®



SALOMON

Our industrial partners


Rethink Tomorrow



 TEN TECHNIP ENERGIES

Our strategic shareholders

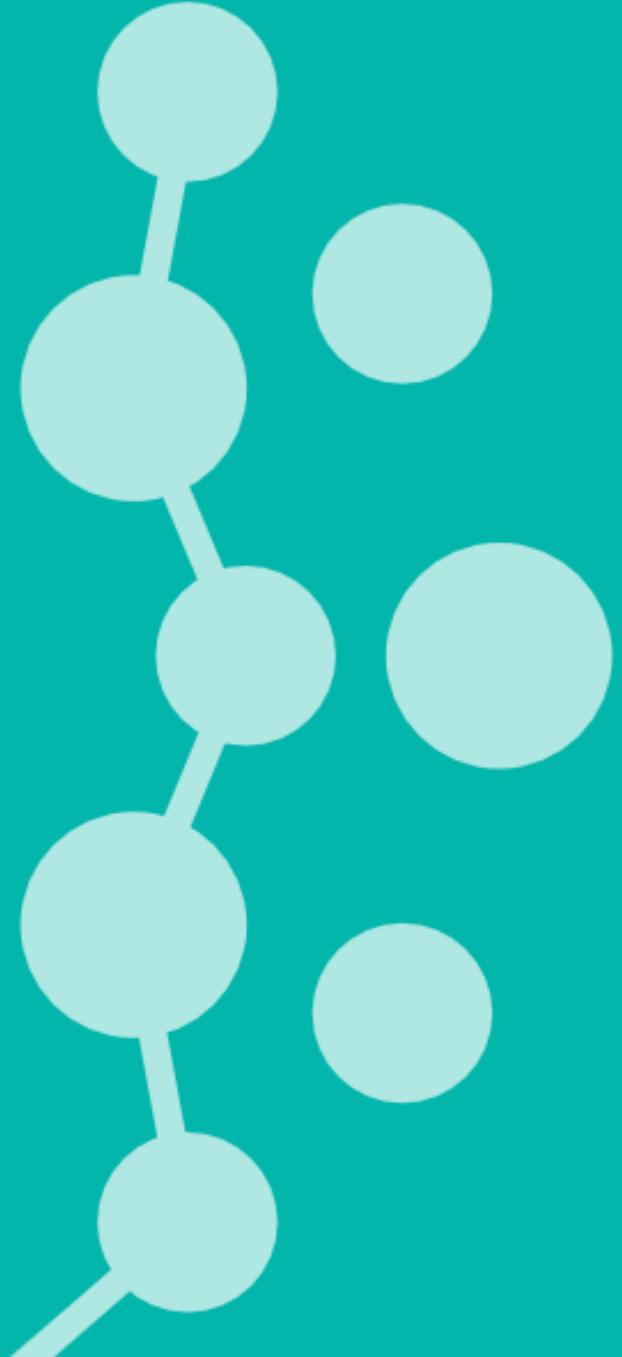
L'ORÉAL

 MICHELIN

 L'OCCITANE
EN PROVENCE



Carbios PLA enzymatic biodegradation technology





Enzymatic biodegradation technology

FIRST ENZYMATIC SOLUTION
TO MAKE PLA COMPOSTABLE IN DOMESTIC CONDITIONS



On track for
commercial
roll-out



A technologie based on
Circular economy



A fully operational
industrial unit



«OK Compost Home»
certification by TÜV
Austria



An innovative solution for PLA-based single-use plastics

AN INNOVATIVE ENZYMATIC ADDITIVE TO MAKE PLA COMPOSTABLE IN DOMESTIC CONDITIONS
at ambient temperature



Ease of use

Introduced as an additive on conventional industrial lines

Circular

The compost is used as a fertilizer or help to produce biogaz

Compostable

100% Home compostable, at room temperature

Competitive

Circularity of composting versus incineration / landfill



A sustainable biodegradation technology suitable for a large range of applications



■
Food packaging



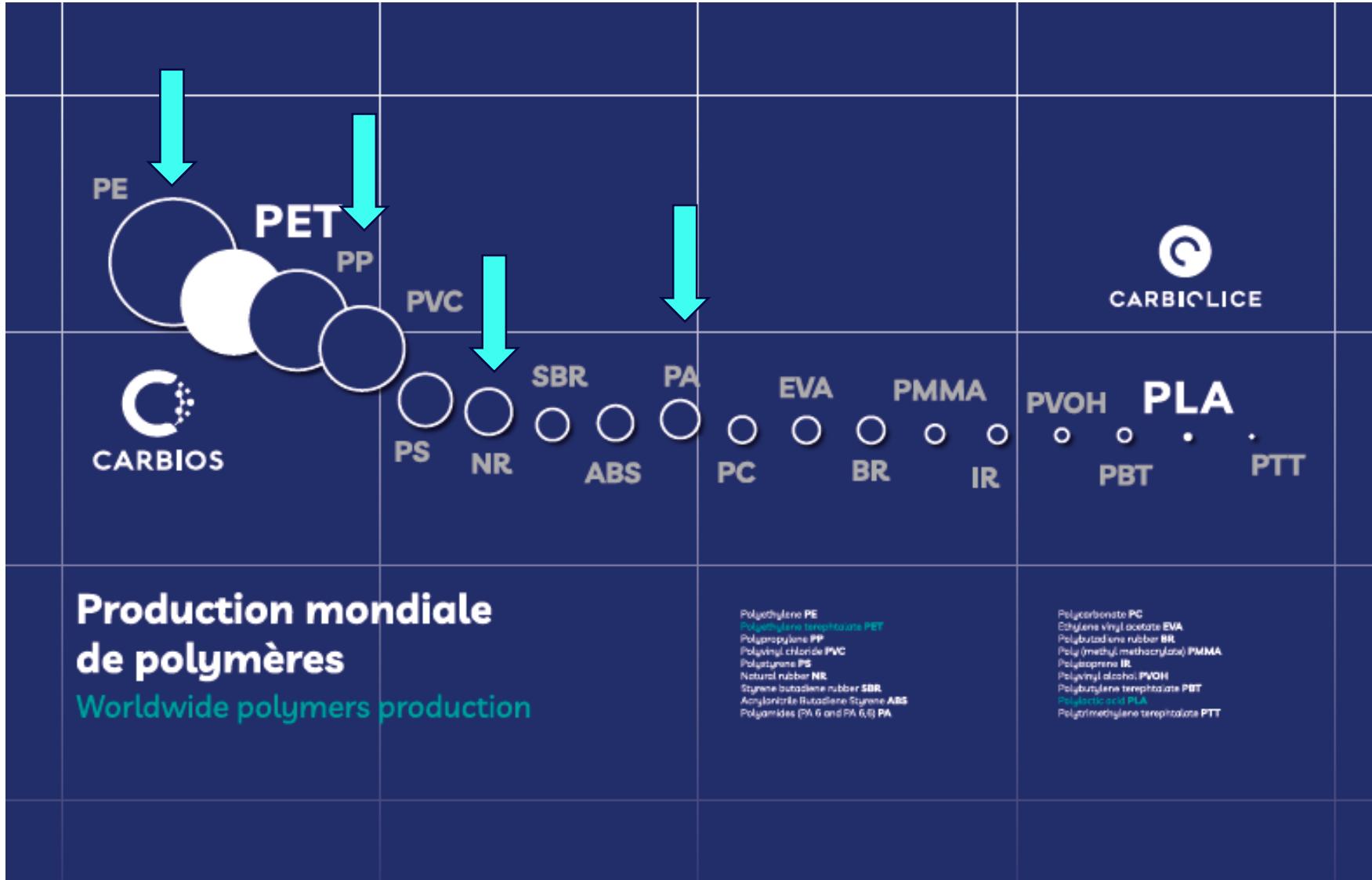
■
3D printing



■
e-Commerce
air-cushion

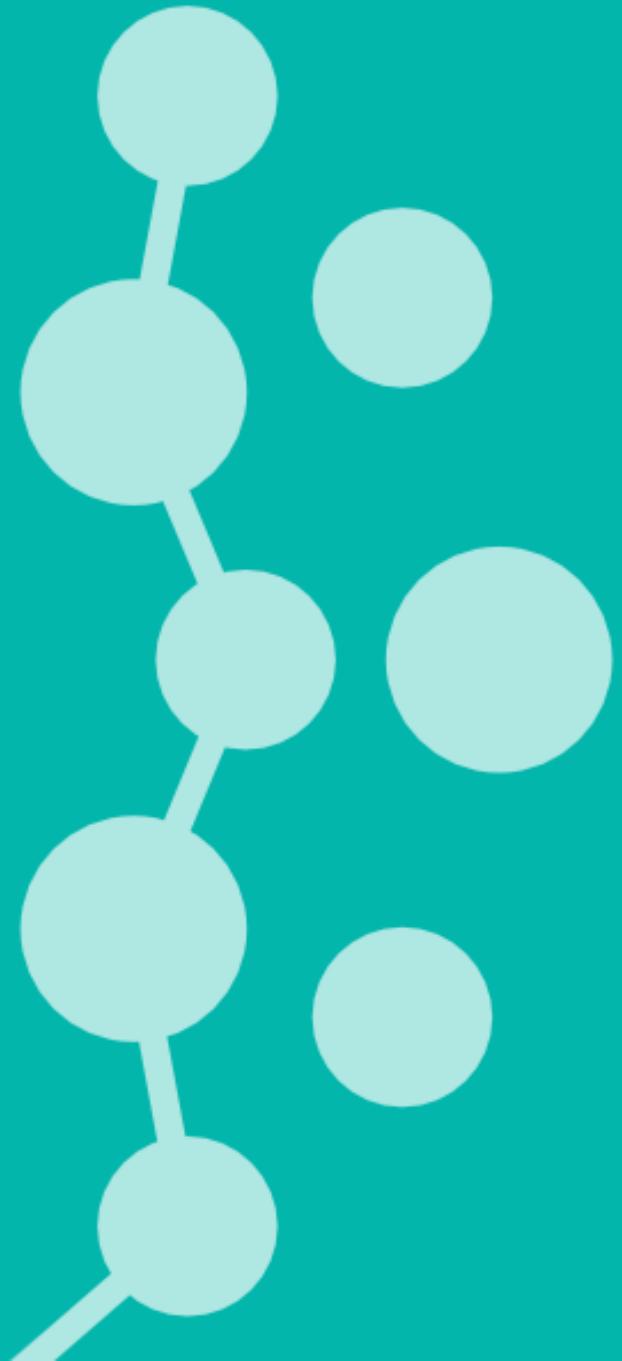


After PET and PLA, what's next?





Appendix





2022 Highlights

Scientific milestones

- Production of a 100% enzymatically recycled **white fiber from colored textile waste** (March 2022)
- Publication of an article in the prestigious **Biophysical Journal** (July 2022)
- Grant of the **Biocat Award** to Carbios' CSO, Prof. Alain Marty (August 2022)

Industrial scale-up

- Collaboration with **Indorama Ventures** to built the world's first 100% biorecycling plant in France (February 2022)

Corporate & Finance

- **€30 million EIB loan** drawn down in June 2022
- Launch of a textile Consortium with **On, Patagonia, PUMA and Salomon** (July 2022)
- Publication of Carbios' first **Sustainability report** (Dec. 2022)



A strong and worldwide intellectual property

As of June 30th, 2022

51 patent families

318 patent applications worldwide

Carbios
42 families
(274 patent applications)

Carbiolice
9 families
(44 patent applications)

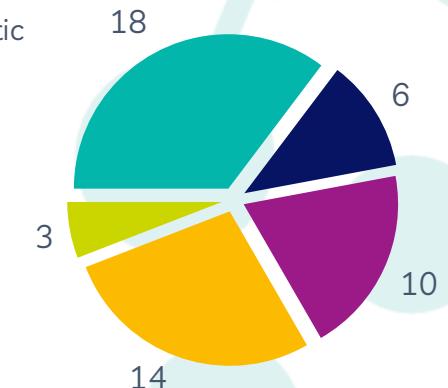
67 granted patents (from 23 different patent families)
In Europe, United-States, Canada, Mexico, China, India, Japan, Korea, Brazil...

Worldwide pending applications



Patent family distribution by project

- Biodegradable plastic production
- PLA enzymes
- Recycling process
- PET enzymes
- Bioproduction

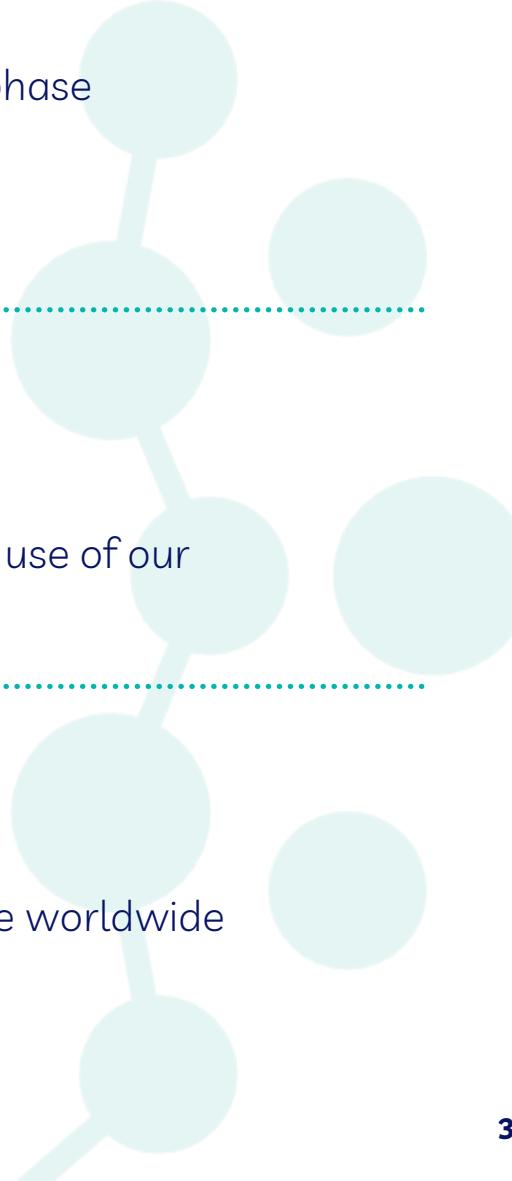




IP, an underlying asset for business success



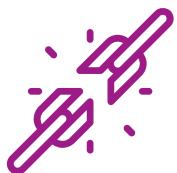
Active policy of securing and strengthening our innovations

- Protection of our results from the upstream lab phase to the final industrial phase
 - Covering enzymes, processes, products and applications
 - When necessary, acquisition of know-how and rights from third parties
- 



Keeping a watch on competitors, technology and patents

- Identify existing prior art before applying for patents
 - Identify emerging work, expertise and patents in relevant fields, to ensure the use of our processes and products without restrictions
- 

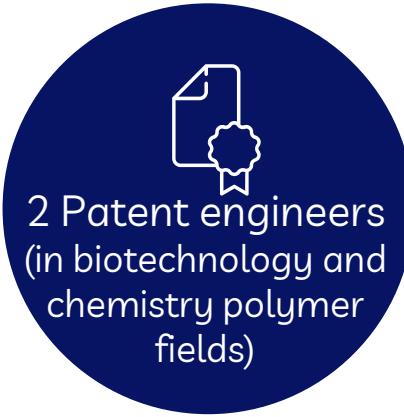


Ensuring our freedom to operate

- When collaborating with third parties (academics and/or private companies):
 - Full ownership of the collaboration results or co-ownership and exclusive worldwide exploitation rights for the results within the company's fields of activity
 - Action against third party's patent application
- 



Our IP team



2 IP consultancy firms

with

3 European patent attorneys
(each with 15-30 years of
experience)

Intellectual Property Committee

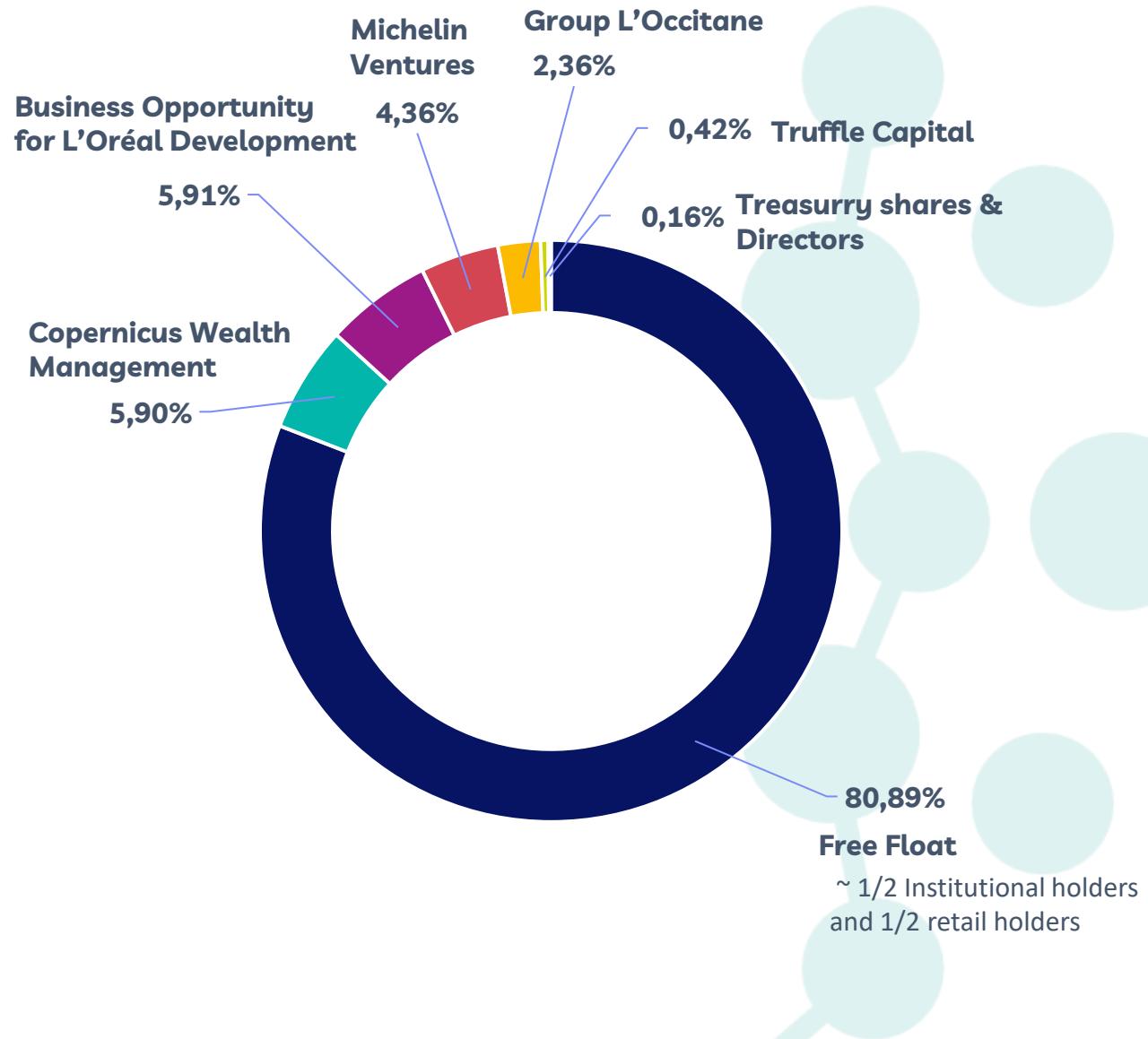
reporting to the Board of
Directors



Share & Shareholders as of June 30, 2022

Listing	Euronext Growth Paris
Ticker	ALCRB
ISIN Code	FR0011648716
Number of shares	11,207,356
ICB classification	Chemistry / Speciality chemistry

Analyst coverage	
ODDO BHF	Jeremy Garnier
BRYAN GARNIER	Paul de Froment
GILBERT DUPONT	Alexandre Letz
KEPLER CHEUVREUX	Baptiste de Leudeville
BNP PARIBAS EXANE	Laurent Jelebart





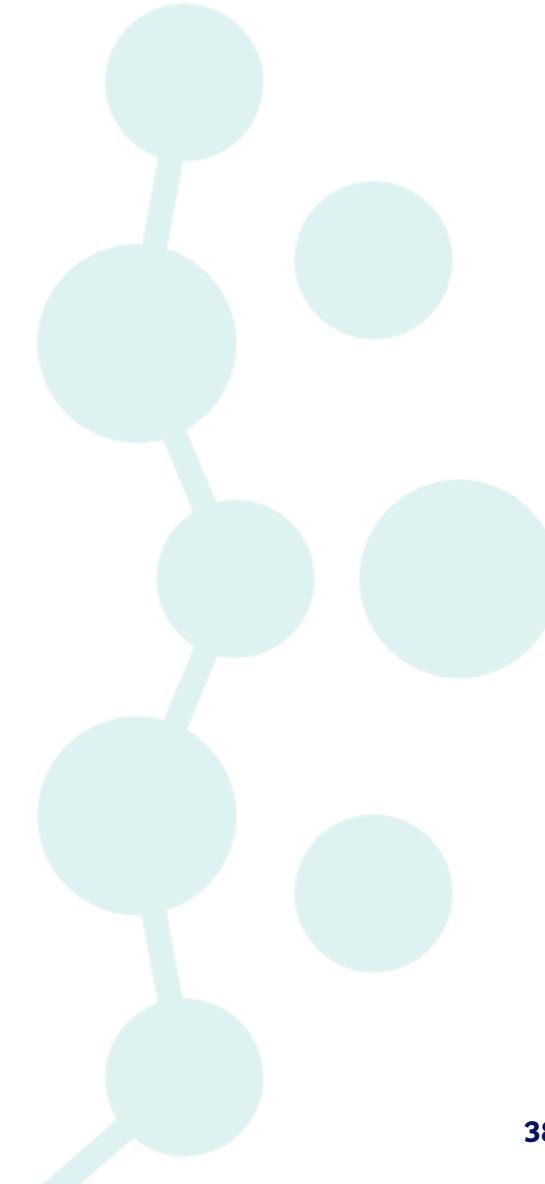
HY 2022 Consolidated statement of income

Consolidated statement of income (in thousand euros)	June 30, 2022 (6 months)	June 30, 2021 (6 months)
Operating Income		
R&D expenses, net	9	28
Sales and marketing expenses	(5,540)	(2,335)
General and administrative expenses	(1,354)	(845)
	(4,637)	(2,491)
Operating expenses	(11,531)	(5,671)
Other operating income and expenses	26	21,204
Operating income (loss) (2)	(11,496)	15,560
Net financial income	(316)	(187)
Income before taxes	(11,811)	14,245
Income Tax	-	-
Share of profit (loss) of equity affiliates (3)	-	(1,128)
Net income or loss for the period (4)	(11,811)	14,245
IFRS accounting impact related to the takeover of Carbiolice:		
Other operating income and expenses (1)	-	21,204
Share of profit (loss) of associates (3)	-	(1,128)
Operating income (loss) "adjusted" of the IFRS impacts related to the Carbiolice takeover (2)-(1)	(11,496)	(5,643)
Net Income or loss "adjusted" of the IFRS impacts related to the Carbiolice takeover (4)-(1)-(3)	(11,811)	(5,830)



HY 2022 Consolidated statement of financial position

Consolidated statement of financial position (in thousand euros)		
	June 30, 2022	December 31, 2021
ASSETS		
Goodwill	20,583	20,583
Intangible assets	23,219	23,188
Tangible assets	22,057	16,466
Right-of-use assets	5,930	6,989
Financial assets	442	388
Non-current assets	72,231	67,614
Trade receivables	-	16
Other current assets	5,087	6,148
Cash and cash equivalent	121,372	104,956
Current assets	126,459	111,120
Total assets	198,690	178,734





HY 2022 Consolidated statement of financial position

Consolidated statement of financial position (in thousand euros)	June 30, 2022	December 31, 2021
EQUITY AND LIABILITIES		
Share capital	7,845	7,826
Share and contribution premium	146,471	146,337
Consolidated reserves	(6,494)	(10,604)
Retained earnings	3,833	(600)
Net income – share attributable to equity holders of the parent company	(11,811)	3,780
Shareholders' equity	139,844	146,739
Provisions – Non-current portion	175	202
Loans and financial liabilities – Non-current portion	37,817	11,941
Lease liabilities – Non-current portion	4,396	5,358
Deferred tax liabilities	1,694	1,694
Non-current liabilities	44,081	19,194
Provisions - Current portion	-	76
Loans and financial liabilities – Current portion	2,134	1,376
Lease liabilities – Current portion	1,181	1,256
Trade payables	6,951	5,137
Other current liabilities	4,498	4,956
Current liabilities	14,765	12,801
Total liabilities and equity	198,690	178,734



HY 2022 Consolidated cash flow statement

Consolidated cash flow statement <i>(in thousand euros)</i>	June 30, 2022 <i>(6 months)</i>	December 31, 2021 <i>(12 months)</i>	June 30, 2021 <i>(6 months)</i>
Cash at beginning of the year	104,956	29,077	29,077
Cash flow from operating activities	(5,256)	(9,044)	(3,509)
Cash flow from investing activities	(6,353)	(22,837)	(14,790)
Cash flow from financing activities	28,619	107,761	108,203
Change in cash position	16,416	75,880	89,904
Cash at end of the period	121,372	104,956	118,982



An experienced management team



Emmanuel LADENT
CEO

30 years' experience in the automotive sector



Pascal BRICOUT
Head of Strategy & Finance

30 years of international experience in finance



Lionnel ARRAS
Industrial Development Director

25 years' experience in the chemical industry & process engineering



Lise LUCCHESI
Intellectual Property Director

Biotechnology engineer & intellectual property expert



Mathieu BERTHOUD
Sourcing and Public Affairs Director

30 years' experience in the chemical & recycling industry



Prof. Alain MARTY
Chief Scientific Officer

International expert in enzymology & biological processes



Stéphane FERREIRA
Director of Operations

More than 20 years' experience in the chemical industry



Our Board of Directors



**DR. PHILIPPE
POULETTY**

Chairman

- Co-Founder & Executive Director of Truffle Capital



**JEAN-CLAUDE
LUMARET**

- Co-founder of Carbios and Ex CEO
- 40 years' experience in the international agro-industry & Intellectual Property expert



**JUAN
DE PABLO ***

- Professor in Molecular Engineering at the University of Chicago's Pritzker School



**EMMANUEL
LAUDENT**

- CEO of Carbios
- 30 years' experience in the automotive sector



**ISABELLE
PARIZE ***

- Chairman of the Supervisory Board of DELSEY Paris
- Board member of Air-France KLM

BOLD
Business Opportunities for L'Oréal Development

**LAURENT
SCHMITT**

- BOLD, Business Opportunities for L'Oréal Development is a private equity fund created by L'Oréal to support the development of innovative start-ups.



**JACQUELINE
LECOURTIER ***

- Ex General Director ANR (National Research Agency)
- Ex Scientific Director IFP (A Public Research Innovation Organization)



**JEAN
FALGOUX**

- Ex Corp. Officer Ajinomoto Inc.
- Ex VP Ajinomoto Europe
- Ex Senior VP Hoechst Roussel



**NICOLAS
SEEBOOTH**

- Michelin Venture is a fund created by Michelin and launched in 2018 in order to materialize Michelin's open innovation approach and to invest in high-tech materials that include a sustainable development dimension.



**VINCENT
KAMEL ***

- Managing Director of the Solvay Polyamide Division
- Director of Coatis Business Unit
- Asia Director for Engineering plastics



**ALAIN
CHEVALLIER**

- Partner Life Sciences, Truffle Capital
- Ex CFO Sanofi-Aventis France





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