

CARBIOS

Enzymes powering the Circular Economy

Corporate presentation

November 2022

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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

97 employees including 2/3 dedicated to RDI

47% Women
53% Men

Multi-sources revenue business model

Exclusive **partnerships**

French biotech connected worldwide

Pr. Jeandrossek
Stuttgart University
Uwe Bornscheuer Greifswald University

CARBIOS

How do we fix this?





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

353 million tons (1)
of plastic waste generated

9 million tons (3)
of plastic enter oceans every year



39 million tons (1)
of textile fiber waste

87% of fibers (4)
from clothing landfilled or incinerated

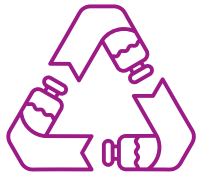
Carbios is best positioned to deliver concrete and sustainable solution to tackle this emergency.

1. OECD 2022. 2. Citigroup in 2018. 3. Ademe in 2012
Photo credit: National Geographic - Plastic crisis impact on wildlife

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

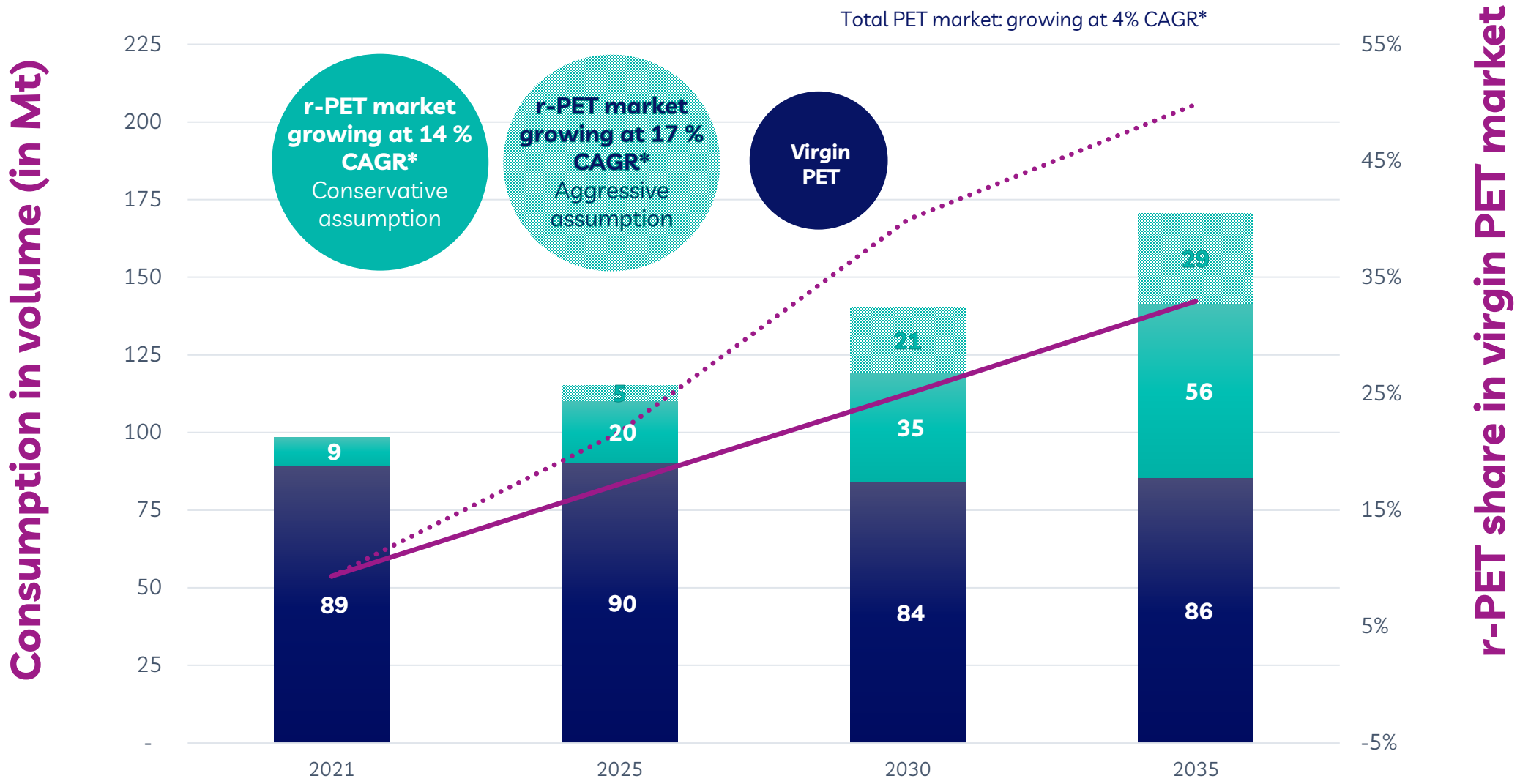
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A booming market for recycled PET with a strong unbalanced Supply / Demand

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Recycled PET, a booming and unbalanced market

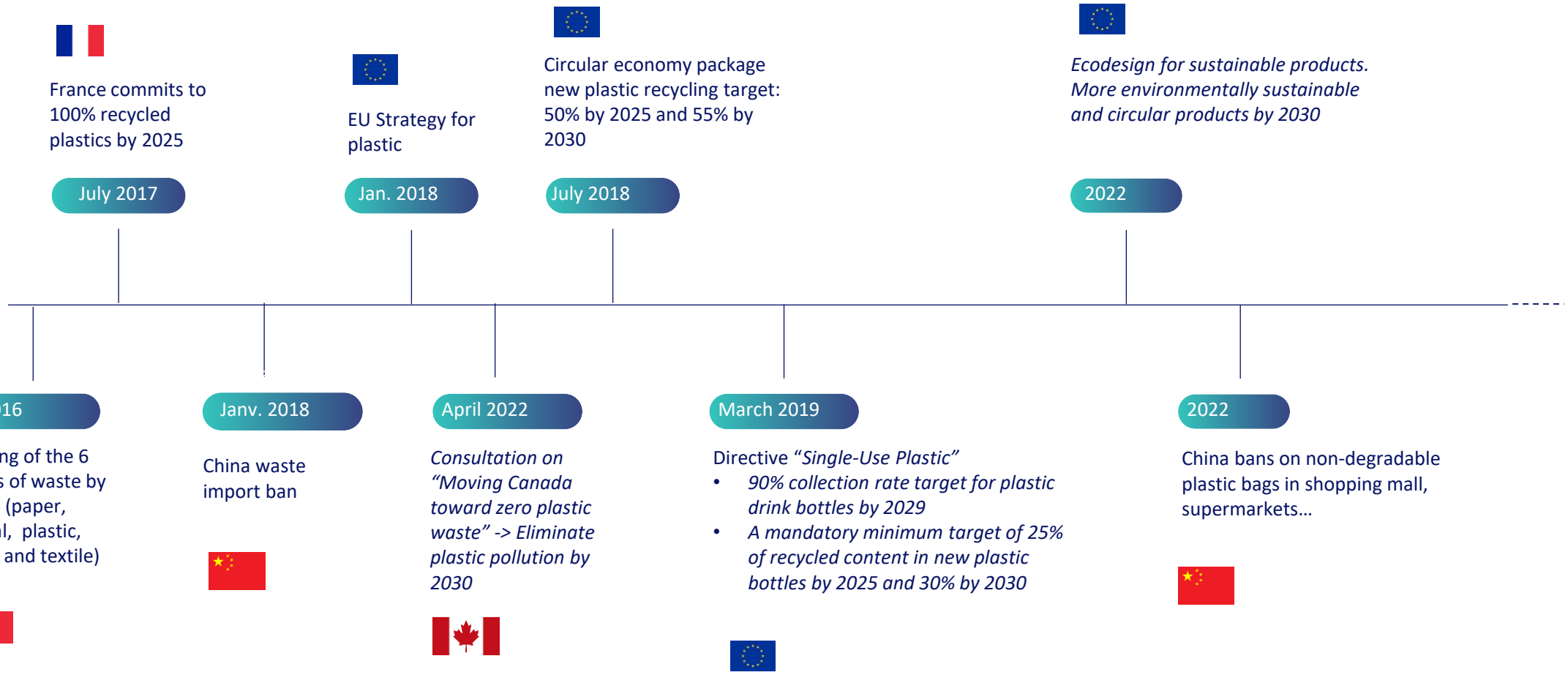


Sources: Carbios assumptions, IHS Markit in 2021, Market Research Future in 2021 and KPC in 2022*

CARBIOS

… Supported by more and more regulations

In France and around the world



… Pulled by Brands' commitments

Addressable markets



■ PET Plastics ■ PET polyester fibers

Packaging: strong drivers for sustainable solutions

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"

L'ORÉAL PARIS

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

Nestlé Waters

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

PEPSICO

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

SUNTORY BEVERAGE & FOOD EUROPE

Apparel & Sportswear demand

On

"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)"

PUMA

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."

patagonia

"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 CO_2e being emitted into the atmosphere."

SALOMON

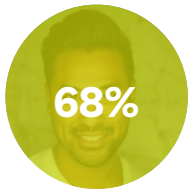
Feb. 2019: "The concept for a fully recyclable running shoe is the first step in Salomon's commitment to have 100 percent of its new products designed to one or several of the company's circular economy principles by 2025."

… and consumers' request for change

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



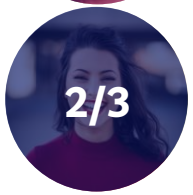
quote for **plastic pollution** as main environmental issue after climate change and ocean pollution



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

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Carbios demonstration plant

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

TECHNIP ENERGIES

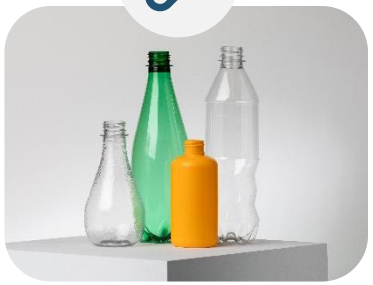
Carbios' journey towards industrialization



SCIENTIFIC VALIDATION

Publication in Nature[1], 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 partners**[1], have presented in June 2021 one of their packaging manufactured in industrial conditions, **made with product coming from our technology**, food-contact approved.

[1]L'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 CO_2 emissions

↑↓

low energy consumption and proximity sourcing

Circular Economy is becoming a reality!

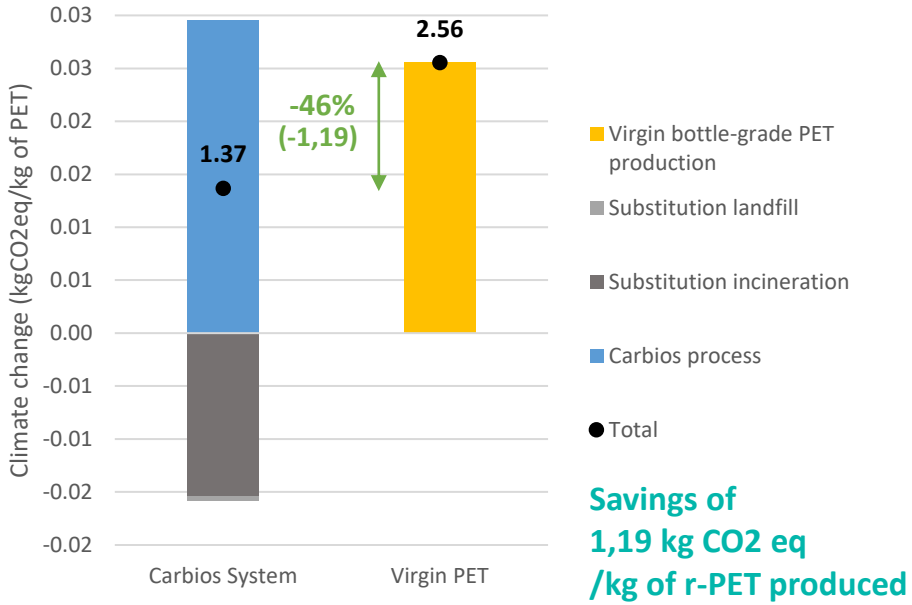
Carbios aims to develop a highly sustainable process for PET life-cycle

46% CO_2 potential savings

Low temperature, no pressure

No solvents

LIFE CYCLE ASSESMENT



Savings of 1,19 kg CO2 eq /kg of r-PET produced

- 50kt processing capacity plant ⇔ 45kt of CO_2 eq. would be potentially saved annually

-> Compared to virgin PET production, taking into account diversion of PET waste from a conventional end-of-life

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Source: *Preliminary Life Cycle Assessment of Carbios PET recycling process, Carbios, 2022*

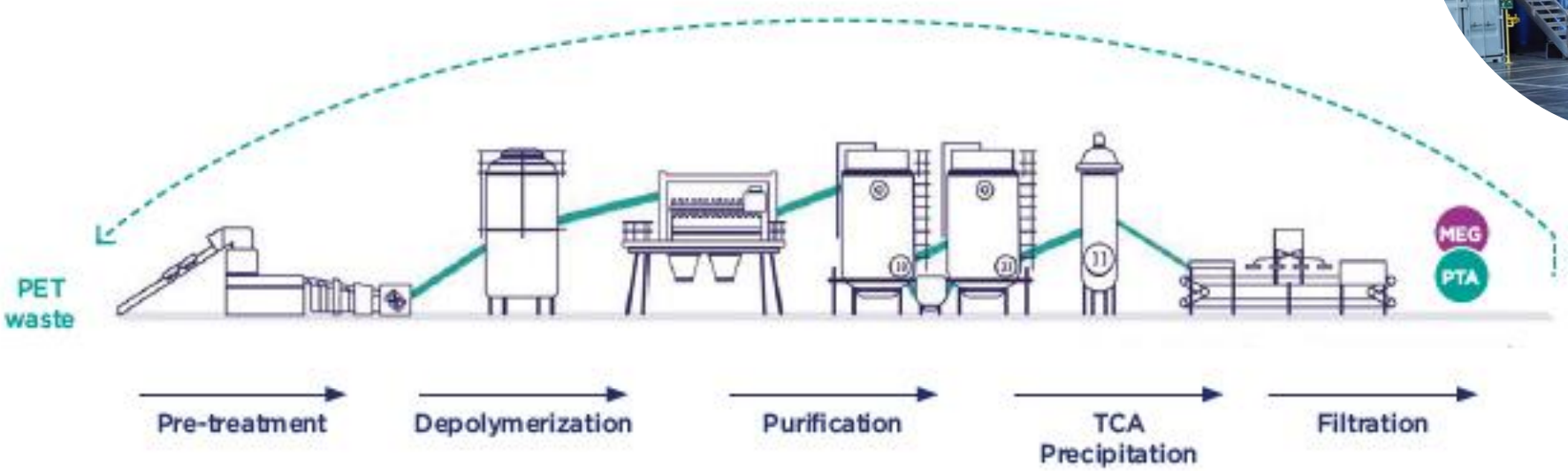
The demo plant has confirmed scale-up performance and robustness

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

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The demonstration plant, last step before commercial scale

Enzyme identification & enzymatic engineering

Picoliter - Microliter

Process scale-up

Reactor: 250 ml to 5 liters

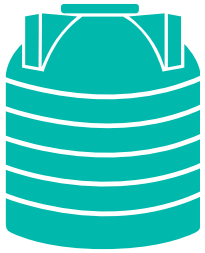
Pilot



Reactor: 1 M³

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

Demonstration plant



Reactor: 20 M³

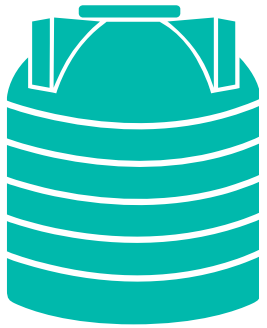
1. SCOPE : Comprehensive : all steps, interlinked
2. QUALITY : Tests on different waste streams, critical parameters product quality
3. DATA ACQUISITION : for the Process Design Package of commercial plants
4. PEOPLE : Develop know-how

Licensing as of 2023



International deployment

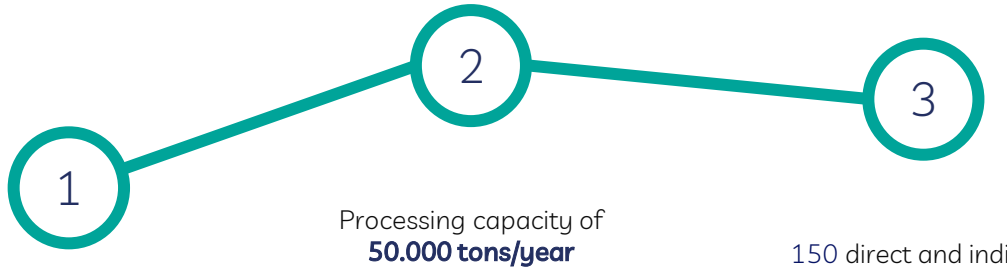
Commercial unit



Reactors: 1200 m³

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

KEY FIGURES



Operational in **2025**

Processing capacity of **50.000 tons/year**
ie. to 2 billion PET bottles or 2.5 billion PET trays

150 direct and indirect **new jobs created**

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

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Project of the first-of-a-kind plant

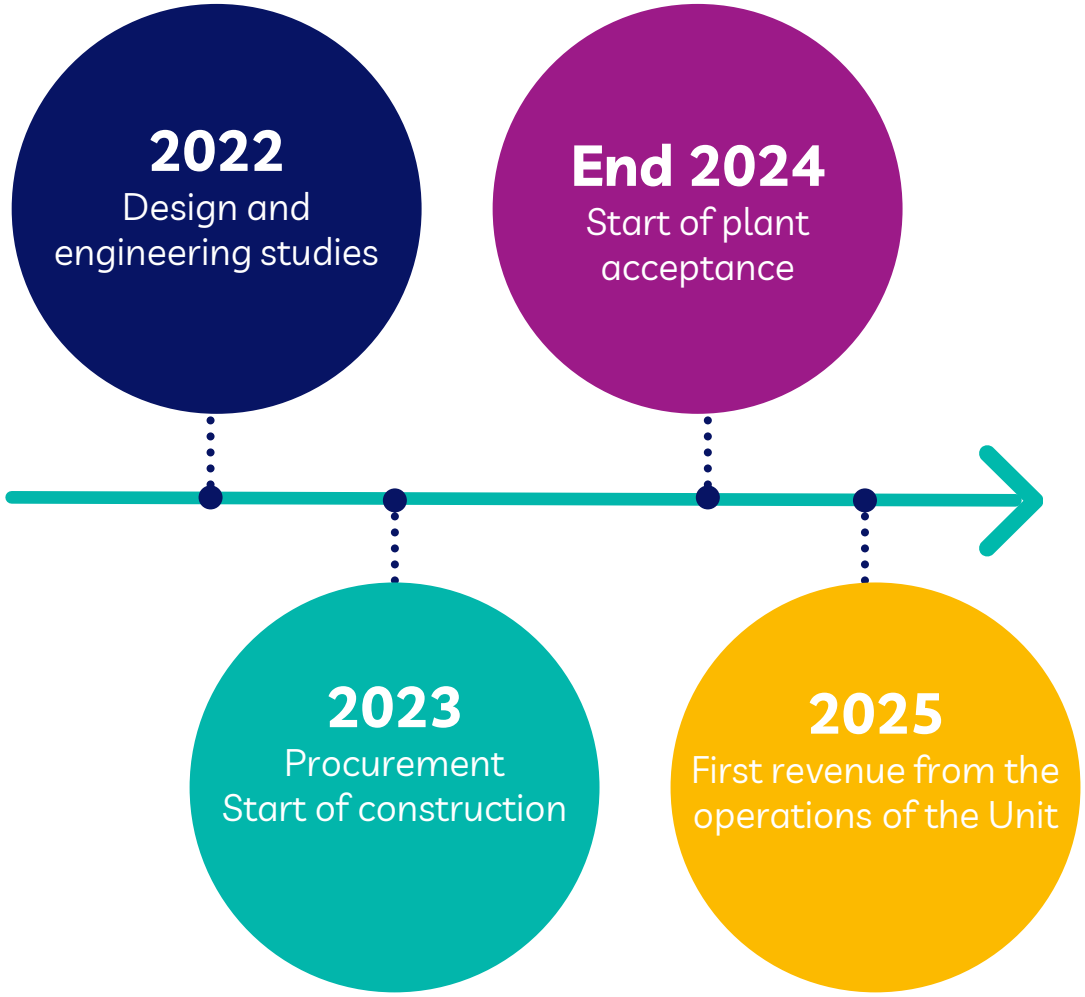
Key figures:

- 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

- **BEG. 2022** — Site selection
- **2022** — Design studies
- **2023** — Construction Starts
- **2025** — **Plant Start up**



Demoplant design and operations

- **SEPT. 2021** — Demonstration plant launch
- **JUL 2022** — 100% completed
- **2023** — Textile Processing
- **2024** — Training operators



Worldwide technology licensing

- **END 2022** — Documentation completed
- **2023** — **Recycling technology licensing**

LICENSING

Carbios' business model: three streams of revenues



*under definition – to be precised in the near future

Our key partners

Our PET Consortium	Our textile Consortium	Our industrial partners	Our strategic shareholders
L'ORÉAL	On	novozymes Rethink Tomorrow	L'ORÉAL
Nestlé Waters	patagonia	INDORAMA	MICHELIN
PEPSICO	PUMA	T.EN TECHNIP ENERGIES	L'OCCITANE EN PROVENCE
SUNTORY BEVERAGE & FOOD EUROPE	SALOMON		



Carbios PLA enzymatic biodegradation technology

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Carbiolice industrial plant

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

Compostable
100% Home compostable, at room temperature

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

Competitive
Circularity of composting versus incineration / landfill

A sustainable biodegradation technology suitable for a large range of applications



Food packaging

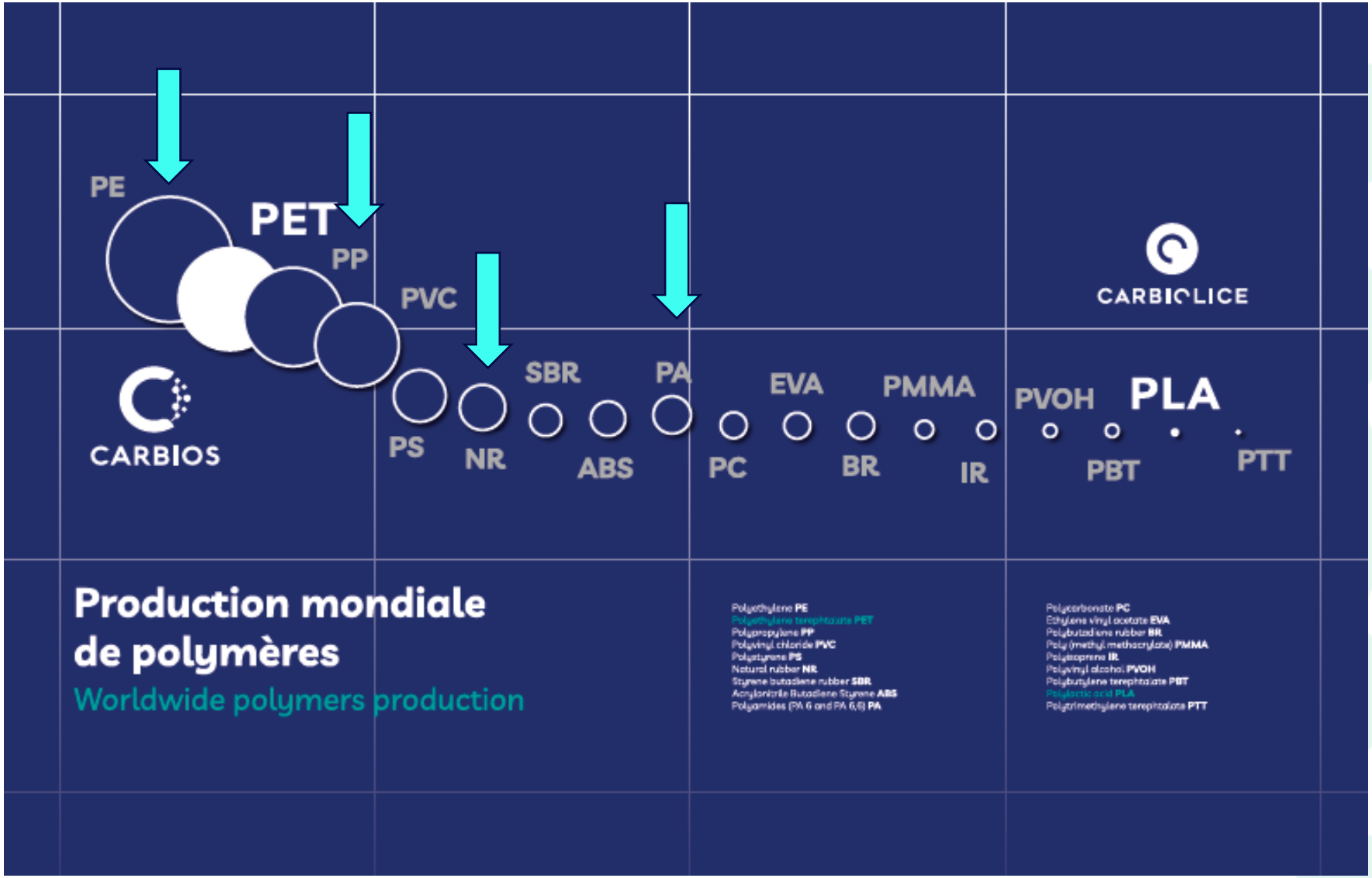


3D printing



e-Commerce
air-cushion

After PET and PLA, what's next?





Appendix

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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

- Appointment of **Philippe Pouletty as Chairman** of the Board of Directors (April 2022)
- **€30 million EIB loan** drawn down in June 2022
- Launch of a textile Consortium with **On, Patagonia, PUMA and Salomon** (July 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)

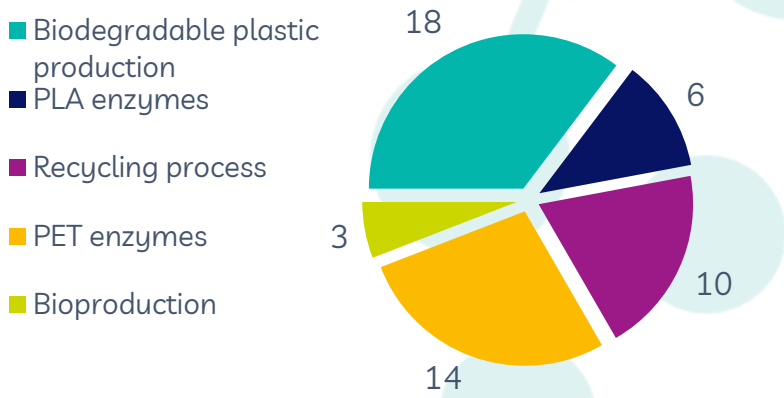
Carbiolice
9 families
(44 patent applications)

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

Worldwide pending applications

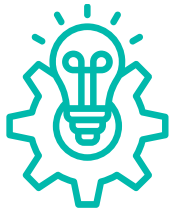


Patent family distribution by project



CARBIOS

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

1 Intellectual Property Director

2 Patent engineers (in biotechnology and chemistry polymer fields)

3 Legal affairs managers

2 IP consultancy firms

with

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

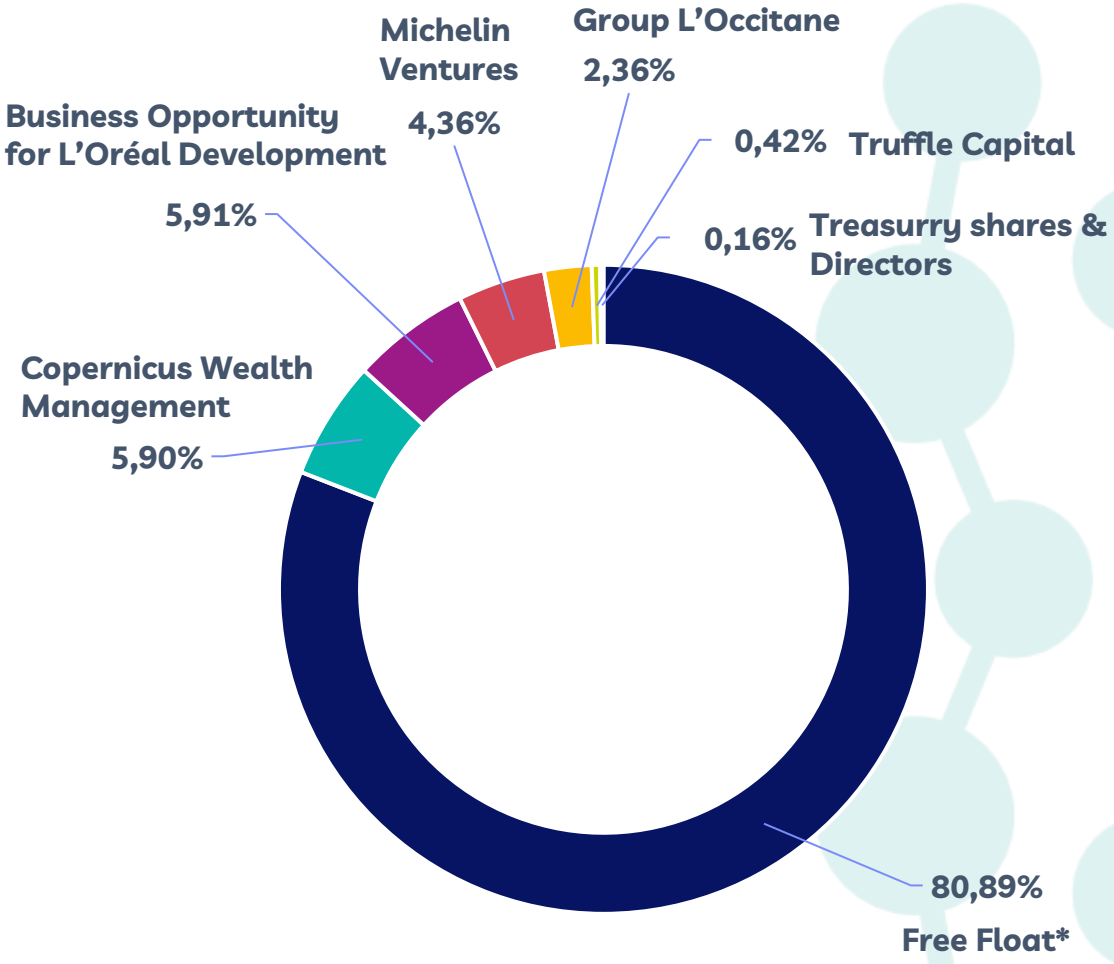
Intellectual Property Committee

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	
BNP PARIBAS EXANE	Laurent Jelebart
BRYAN GARNIER	Xavier Regnard
GILBERT DUPONT	Alexandre Letz
KEPLER CHEUVREUX	Baptiste de Leudeville
ODDO BHF	Jeremy Garnier



*Free Float ~ 50% Institutional holders and 50% retail holders

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	**9**	**28**
R&D expenses, net	(5,540)	(2,335)
Sales and marketing expenses	(1,354)	(845)
General and administrative expenses	(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 *(in thousand euros)*	**June 30, 2022** **(6 months)**	**December 31, 2021** **(12 months)**	**June 30, 2021** **(6 months)**
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



Vanina VARLAMOFF

Legal Affairs and Human Resources Director

Lawyer , Strategic contracts manager & HR supervisor



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



JACQUELINE LECOURTIER *

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



VINCENT KAMEL *

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



JUAN DE PABLO *

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



ISABELLE PARIZE *

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



JEAN FALGOUX

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



ALAIN CHEVALLIER

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



EMMANUEL LADENT

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

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.

MICHELIN

NICOLAS SEEBOTH

- 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.

* : **Independent Directors**

CARBIOS

Enzymes powering the Circular Economy

THANK YOU!