8th edition

Smart PLASTICS

10|11 NOV 2021 MUSEO ALFA ROMEO AREESE

IL FUTURO DEI TECNOPOLIMERI NELLA GREEN ECONOMY

THE FUTURE OF TECHNOPOLYMERS IN THE GREEN ECONOMY

Eligio Martini, Managing Director - GRUPPO MAIP

plast PLAST:DESIGN

OUR VISION

MAIP Group is like a running child, by nature intellectually **CURIOUS**.
Everyday he runs toward the **FUTURE and INNOVATION.**
He goes through a greenfield, fully **respecting ENVIRONMENT & ETHIC.**

MAIP NEW SITE (Italy)

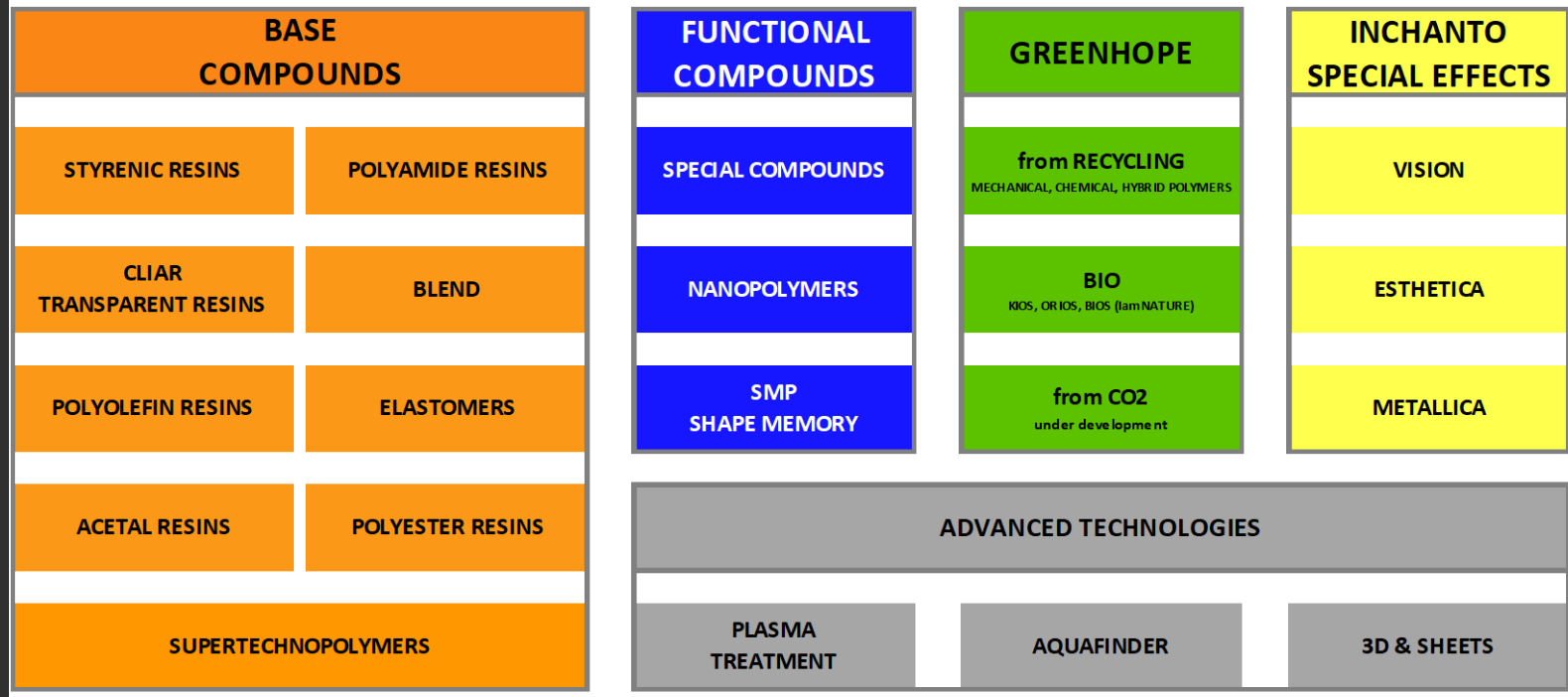
KEY FACTS:

- **Focus: ZERO CO_2 emissions.**
- Photovoltaic solar plant, able to cover the 30% of the Company Consumption.
- REDUCTION OF CO_2 EMISSIONS OF ABOUT 800 tons/ year through the purchase of energy produced exclusively from CERTIFIED RENEWABLE SOURCES.
- Further positive balance of about 100 T of CO_2 thanks to the contribution of the green areas (MAIP PARK) owned or managed by our Group.
- A new Benchmark for the Compounding Industries. Full integration Industry 4.0.
- Almost doubling Capacities.

R&D CENTER

OUR RANGE PRODUCTS

- ENGINEERING POLYMERS
- SPECIAL EFFECTS
- TAILOR MADE PRODUCTS
- NEW & GREEN POLYMERS
- ADVANCED TECHNOLOGIES

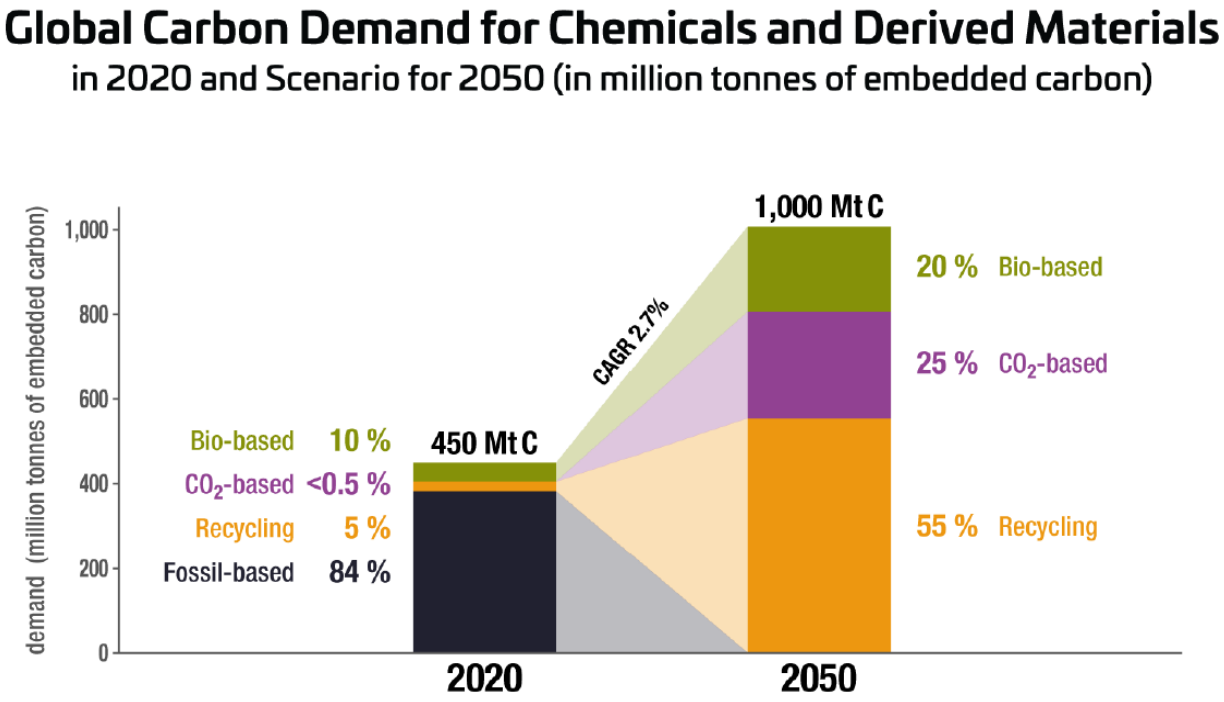


THE FUTURE OF PLASTIC

The most visionaries envision an absolute revolution, the DISRUPTION of the current chemical industry.

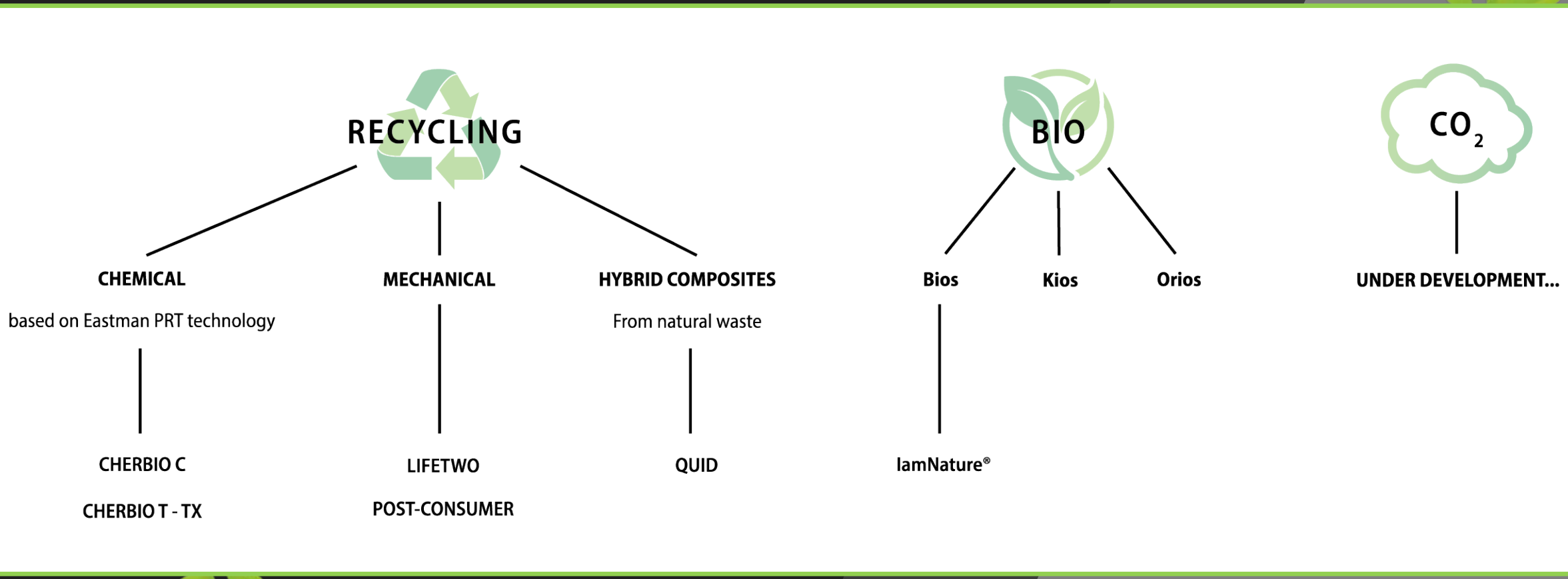
THE FUTURE OF POLYMERS

GLOBAL CARBON DEMAND AND SCENARIO FOR 2050



available at www.renewable-carbon.eu/graphics

OUR GREEN RANGE PRODUCTS



GREENHOPE POLYMERS

RECYCLING

- Mechanical Recycling — LIFETWO
- Chemical Recycling — CHERBIO
- Hybrid composites — QUID

GRUPPO MAIP

LIFE TWO

RECYCLING AND UPGRADING

GRUPPO MAIP

LIFE TWO

RECYCLING AND UPGRADING

The logo is registered worldwide, recalling **the phoenix rising from its ashes, symbolizing the second or third life of a plastic** material.

LIFETWO products are characterized by several specific properties:

Dedicated and tailor made formulation for the various technical requirements.

- **Physical-mechanical properties near to prime**
- **Homogeneus properties within the production batch**
- **Homogeneus performances batch to batch**
- **Processability near to Prime**
- **Quality certificates for each single lot**

LIFE TWO

RECYCLING AND UPGRADING

OUR CERTIFICATIONS

The brand **LifeTwo** is an environmental product certification system dedicated to materials obtained from the valorisation of plastic waste.

We have chosen CSI certification as it introduces the concept of **“Quality"** in recycled plastics and the concept of **“Traceability"** of recycled materials, which are the basis of our Company Quality Philosophy.

CSI
RECYCLED PLASTIC
min. 55% PCR+PIR
Licence RPP210137

CSI
RECYCLED PLASTIC
min. 55% PIR
Licence RPP210138

CSI
RECYCLED PLASTIC
min. 75% PCR+PIR
Licence RPP210136

LIFE TWO

WHAT'S READY TO APPROVED

The LIFETWO portfolio is above all dedicated to technical materials, of which we give below some grades with relative technical data sheets.

Famiglia materiale	Classe FCA	Sigla ISO	MAIP				
			Disponib. Kit provini	Nome commerciale	Grado Recupero	% Riciclato (PI/PC)	Approvazione Dichiaraz.
PP	PP 65.40	PP-TD25		LIFETWO 40 516	Post Industrial	>75	Inviata
	PP 140.80	PP-GF30		LIFETWO 40 640	Post Industrial	>75	Inviata
	PP 130.50	PP-(GF15+TD15)		LIFETWO 40 340/316	Post Industrial	>75	Inviata
	PP 140.120	PP-GF30		(LIFETWO 40 640)	Post Industrial	>75	Inviata
	PP 135.90	PP-GF20		LIFETWO 40 440	Post Industrial	>75	
	PP 145.110	PP-GF40		LIFETWO 40 840	Post Industrial	>75	Inviata
PA	PA 240.80	PA66-GF30		LIFETWO A 640	Post Industrial	>75	Inviata
	PA 210.50	PA66-GF15		LIFETWO A 340	Post Industrial	>75	Inviata
	PA 65.200	PA66+EPDM		LIFETWO A E24B	Post Industrial	>75	
	PA 200.100	PA6-GF30		LIFETWO B 640	Post Industrial	>75	Inviata
	PA estetica cover motore	PA-xxx		LIFETWO ??????	Post Industrial		
PC+ABS	PC+ABS 95.350	PC+ABS		LIFETWO 04 T2	Post Industrial	>65	Inviata
	PC+ABS 100.450	PC+ABS	Sì	LIFETWO 04 65 U1 NERO 388	Post Industrial	>65	
	PC+ABS 105.450	PC+ABS		LIFETWO 04 T4	Post Industrial	>65	Inviata
	PC+ABS 110.80	PC+ABS-GF10		LIFETWO 04 240	Post Industrial	>65	
	PC+ABS 115.70	PC+ABS-GF20		LIFETWO 04 440	Post Industrial	>65	

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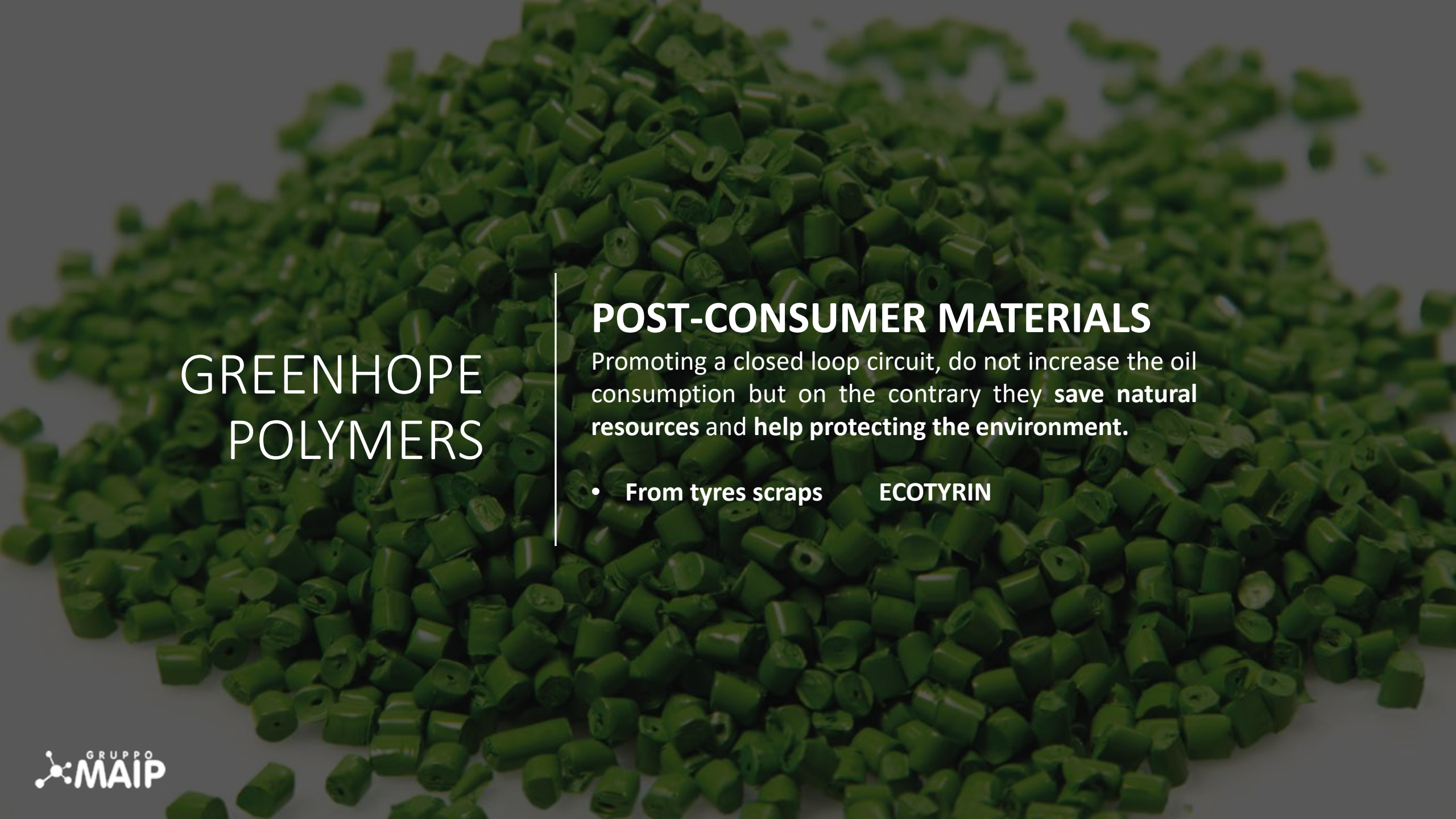

GREENHOPE POLYMERS

POST-CONSUMER MATERIALS

Promoting a closed loop circuit, do not increase the oil consumption but on the contrary they **save natural resources** and **help protecting the environment.**

- **From tyres scraps** **ECOTYRIN**

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ECOTYRIN

MAIP has developped a PP based grade for Mudguard, filled with **recycled Tyres powder**.

GREENHOPE POLYMERS

QUID: INNOVATIVE HYBRID COMPOSITES

The thermoplastic polymer meets one or more **natural materials**, or its scraps, giving a new product connotation and overcoming the traditional dichotomy between artificial and natural.

Quid means innovation. It's expressed in a new sensorial way by means of the new use of products whose nature is theoretically opposite.

- **WARMI** **Polyolephines and wood**
- **QUIR** **Thermoplastics and pure leather**
- **NATIVE** **Thermoplastics and vegetal fibers**
- **RAIN** **Agroindustrial waste**
- **SUBERI** **Thermoplastics and cork**

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GREEN POLYMERS

WARMI
WARMIFLEX

It passes Stellantis specification.

MECHANICAL RECYCLING

- **Mechanical and molecular recycling - Some things are just better together.**
- Historically, “made with recycled content,” refers to materials and products made from mechanical recycling and also known as traditional recycling.
- The mechanical recycling process includes collecting waste plastic from recycling bins, delivering to a recycling center, cleaning, chopping, then remelting and forming plastic pellets that will be used to make other products.

- **Mechanical recycling is a very effective, environmentally friendly process that should be used whenever possible to avoid polymers end up in landfills or incinerators.**

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MECHANICAL RECYCLING IS USEFUL, BUT IT HAS LIMITATIONS:

- Requires clean sources of materials .
- Materials can only be mechanically recycled a finite number of times due to degradation, often resulting in reduced performance in key properties.
- There are a lot of different types of plastics produced: mechanical recycling can only process some of them in huge quantities.
- There are a lot of different types of plastics produced: mechanical recycling needs a good sorting of each one.
- Mechanical recycling is designed to delay plastic from going to the landfill, but alone it is not enough. We need a solution to create products that improve our quality of life and keep them in use longer.

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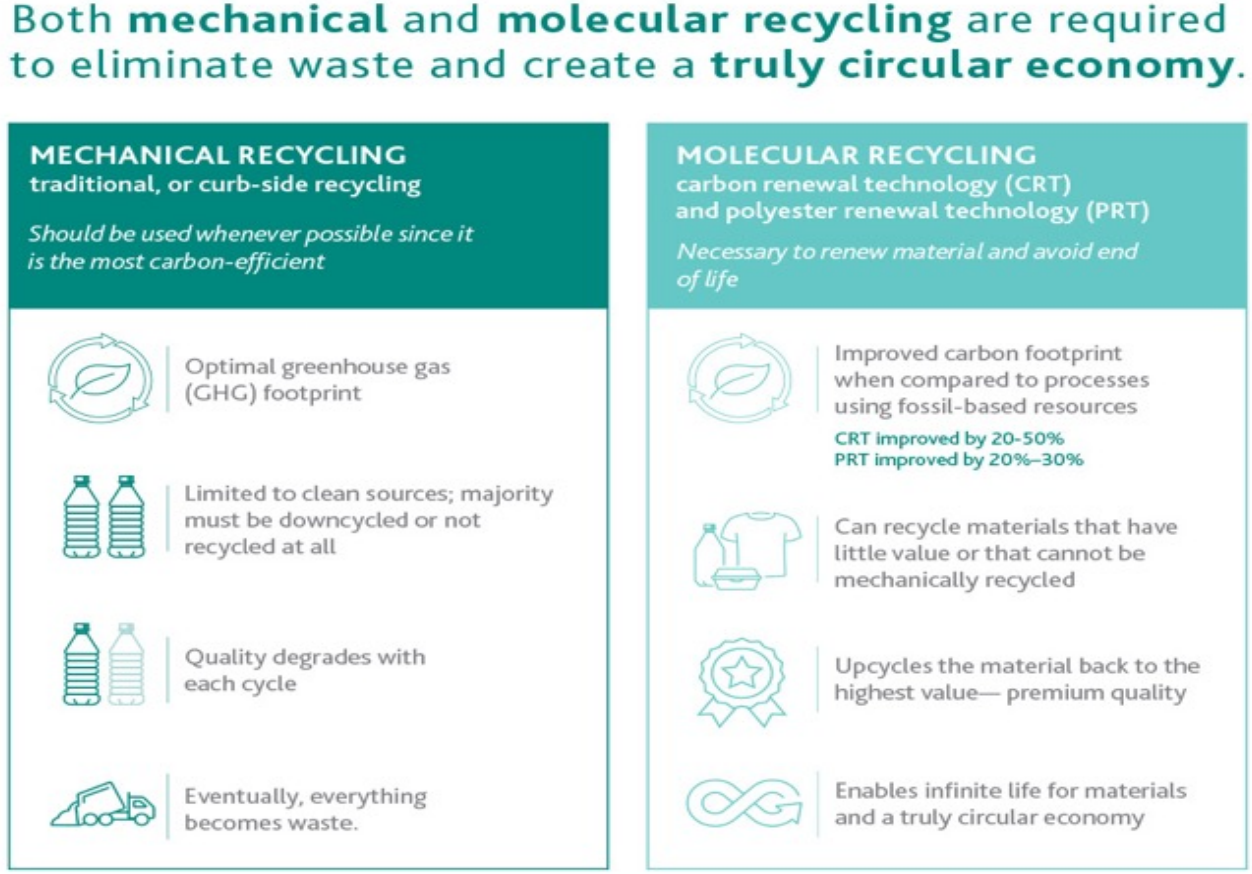
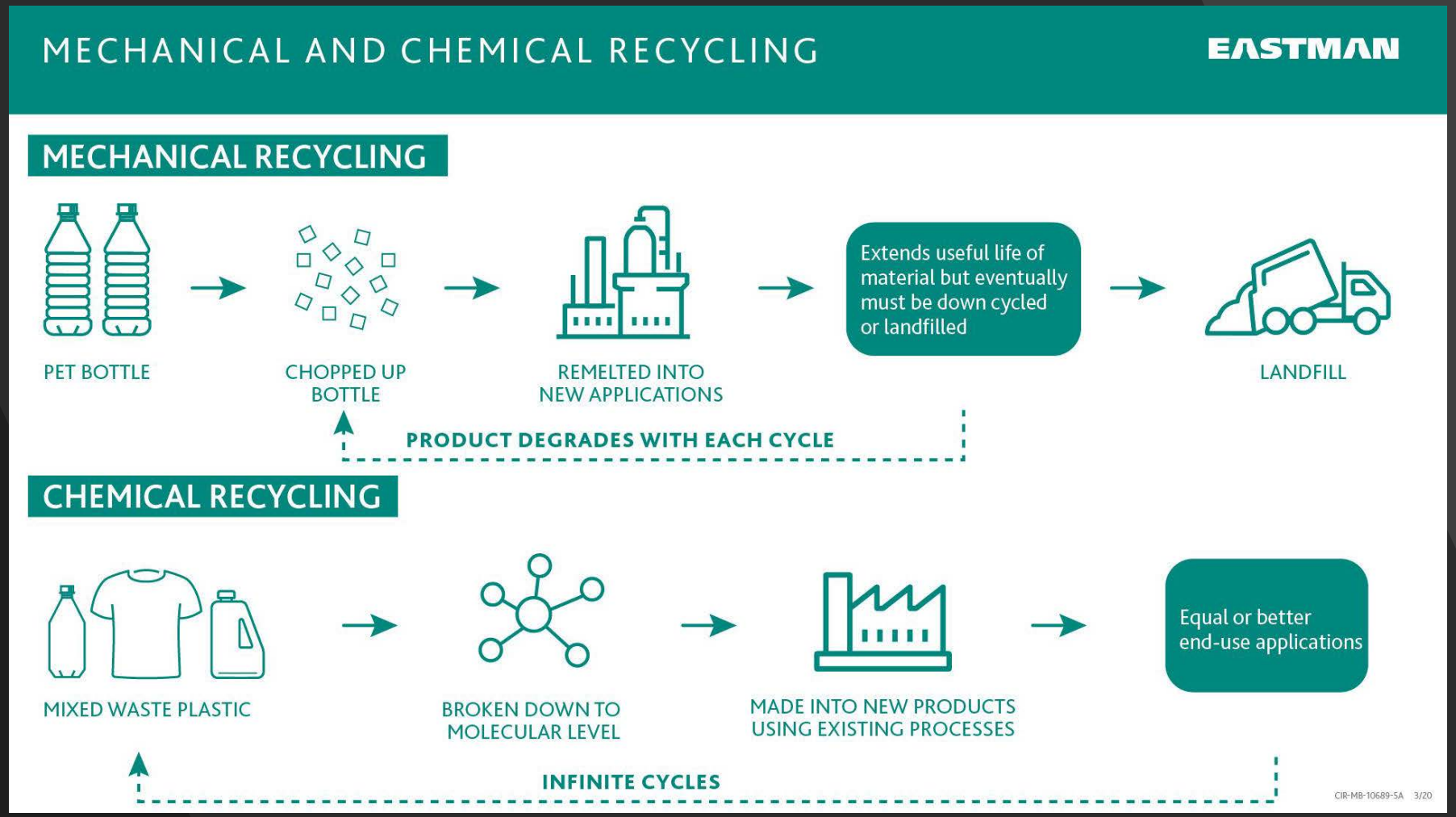
MOLECULAR RECYCLING

Through Eastman's Advanced Circular Recycling technologies, also known as **molecular recycling**, we are creating value from waste. These technologies break down waste into its molecular building blocks so it can be reused over and over again—creating an infinite life span for materials that were previously destined to be discarded.



MOLECULAR RECYCLING



GRUPPO MAIP AND EASTMAN PARTNER ON NEXT GENERATION SUSTAINABLE MATERIALS FOR AUTOMOTIVE INDUSTRY

Specialty formulations to deliver bio-based and molecular recycled content polymers for interior automotive applications

"**Maip is the right strategic partner** to help bring new sustainable polymer formulations to the automotive industry." said Scott Ballard, Eastman's vice president

FOR CIRCULAR ECONOMY

GREEN POLYMERS

The products we designed on Eastman basis, will be marketed with our new **Che-R-Bio** brand.

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GREENHOPE POLYMERS

MOLECULAR RECYCLING

- Eastman are utilizing two different types of molecular recycling technologies—carbon renewal technology and polyester renewal technology.
- **Carbon renewal technology (CRT)** uses a broad mixture of plastic waste - in some instances items as diverse as mixed plastics, textiles, and carpet - and uses them as a material source. Then, that mixture of waste is converted back to small molecules and chemical building blocks that are used to make a broad range of new consumer products.
- **Polyester renewal technology (PRT)** takes polyester plastics, such as soft drink bottles, carpet, or even polyester-based clothing, and unzips them back to their basic monomers. These monomers are then sent through a polymerization process to make final products.

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MOLECULAR RECYCLING

Based on Eastman molecular recycling technology, MAIP is able to compound and colouring different materials:

- **CHE-R-BIO C based on Carbon Renewal Technology (CRT)**
- **CHE-R-BIO T and CHE-R-BIO TX based on Polyester Renewal Technology (PRT)**

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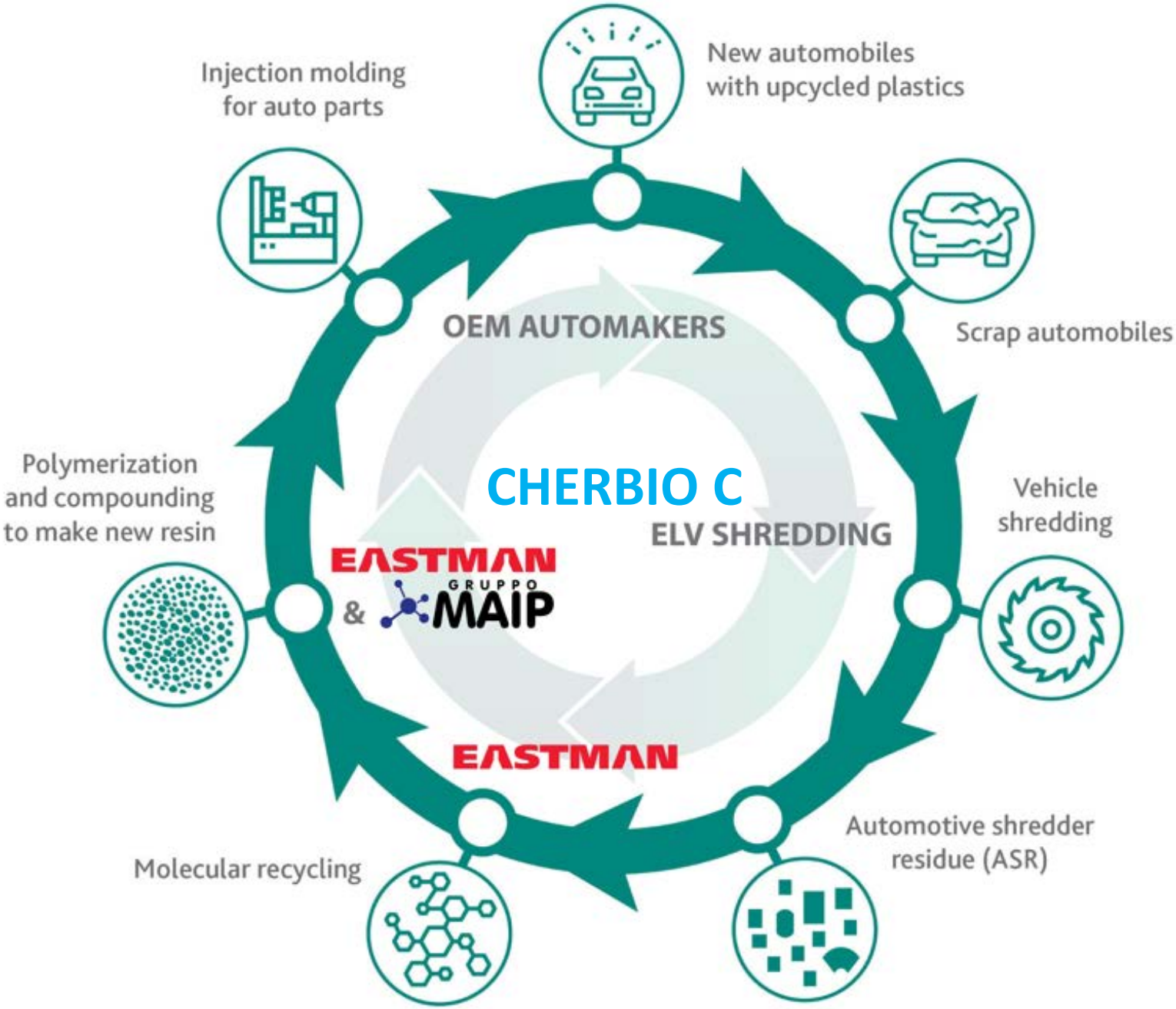
CHERBIO C CELLULOSE BASED + CHEMICAL RECYCLING

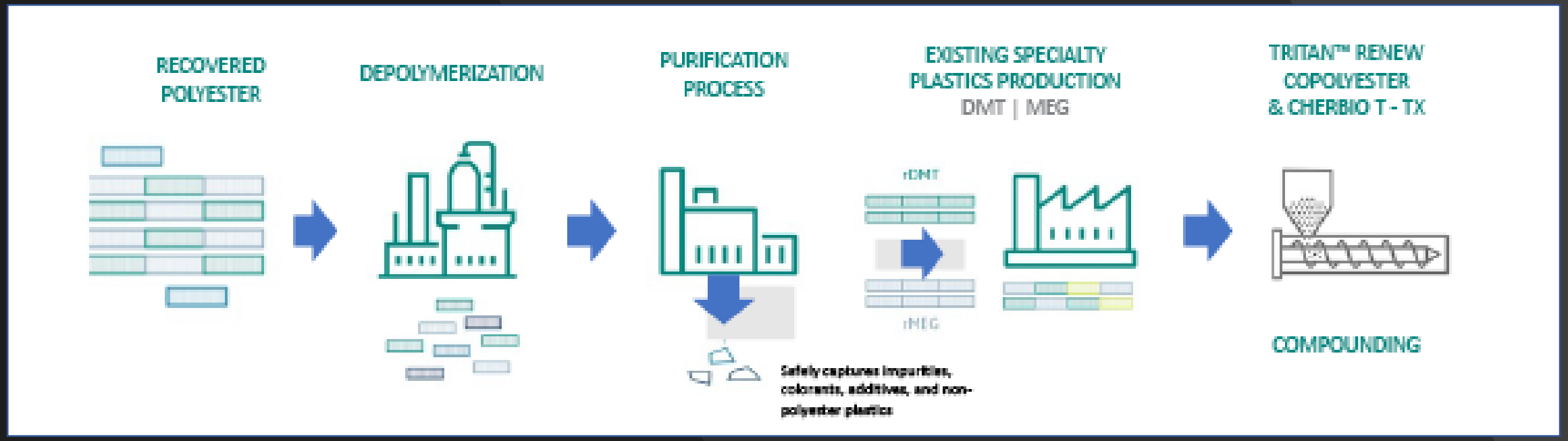
CARBON RENEWAL TECHNOLOGY (CRT)



CHERBIO T– CHERBIO TX

POLYESTER RENEWAL TECHNOLOGY (PRT)

Enables polyesters to be unzipped back to their basic monomers – DMT, MEG



EASTMAN & MAIP FOR CIRCULAR ECONOMY

CHERBIO TX

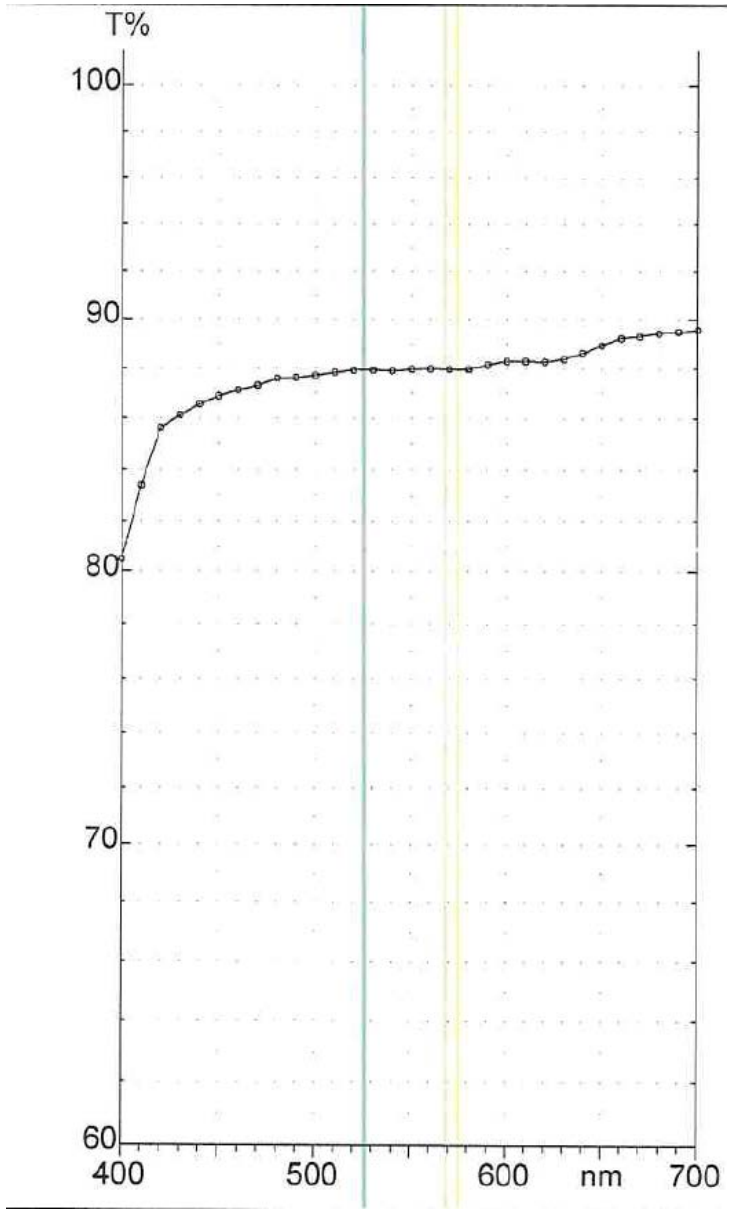
- CHERBIO TX is an unparalleled combination of sustainability, clarity, impact resistance, flowability, temperature and chemical resistance.
- CHERBIO TX is a **polyester alloy** available in different mixing percentages, based on EASTMAN PRT .
- CHERBIO TX provides you with a recycled material content that has a minimum of **30% certified recycled content,** making it easy to put your sustainability story in your report

TRANSPARENCY

CHERBIO TX

- CHERBIO TX is transparent at any thickness
- Optical quality are superb:

Transmittance : > 89%



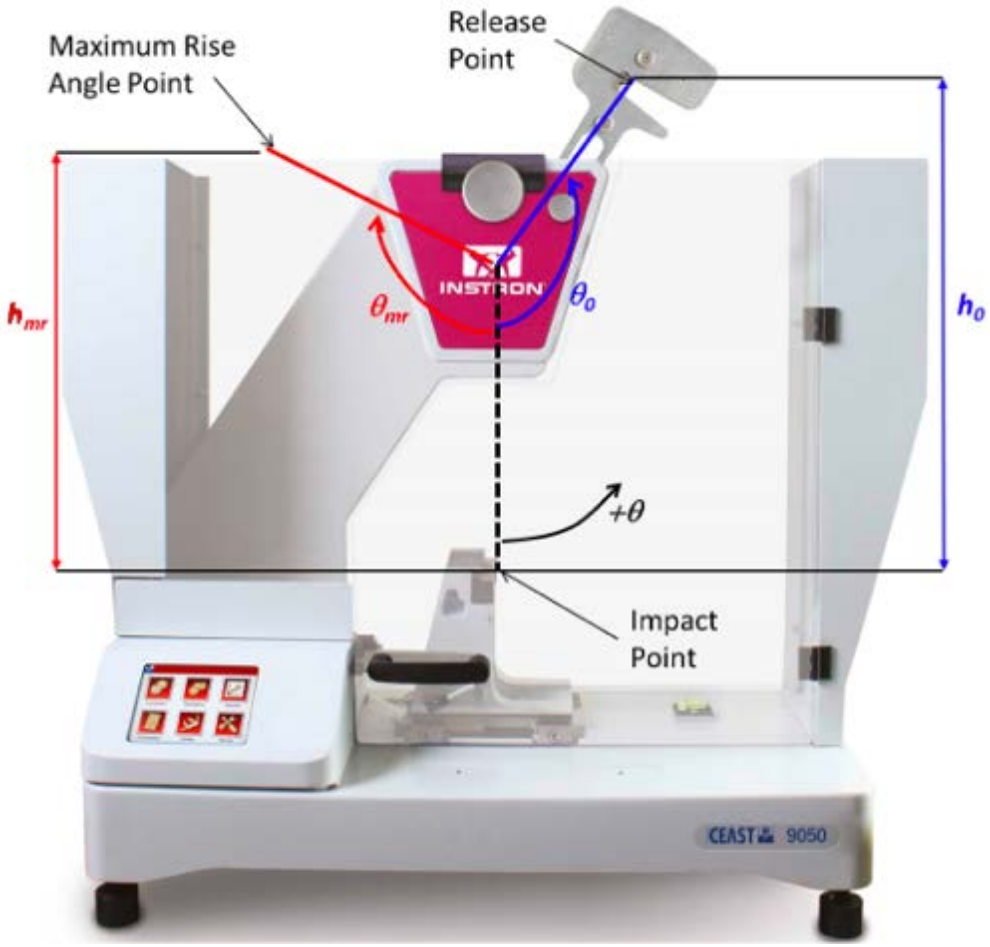
MECHANICAL PROPERTIES

CHERBIO TX

CHERBIO TX looks like glass, but is doesn't break, when it drops... Impact resistance is really very high, practically unbreakable.

Notched Izod values are > 60 KJ/m^2

Elongation at break is > 100%



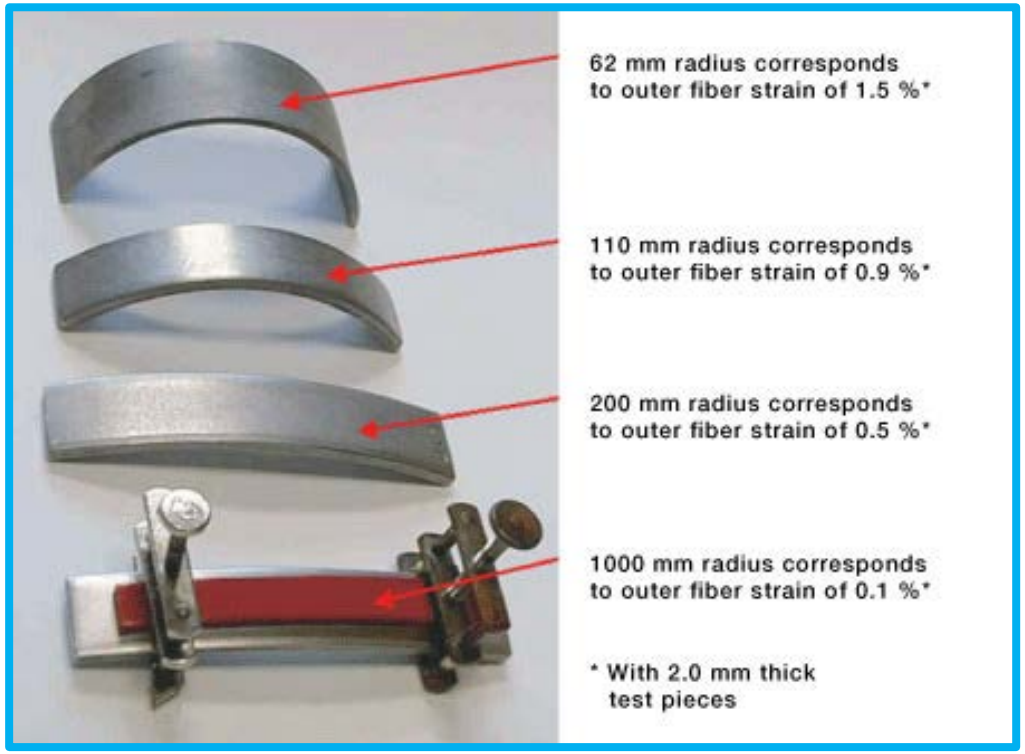
CHEMICAL RESISTANCE

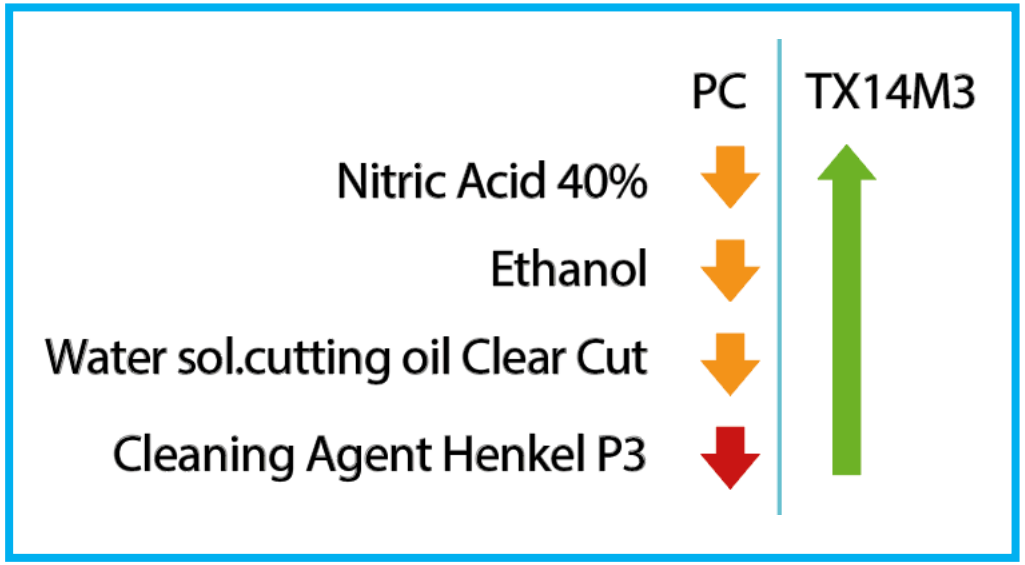
CHERBIO TX

- CHERBIO TX provides a good chemical resistance to various chemicals, especially compared with polycarbonate.
- CHERBIO TX for instance has a good resistance to different mosquito repellents, as DEET (N,N-diethyl-meta-toluamide) and similar insect repellents.
- CHERBIO TX can be formulated in special grades to improve chemical resistance to specific chemicals.

ESCR ENVIRONMENTAL STRESS CRACKING RESISTANCE

CHERBIO TX





APPLICATIONS

CHERBIO TX polymer is a great alternative for a variety of applications, including:

- Car components
- Cosmetic packaging
- Consumer Electronics
- Motorcycles and bicycle components
- Sports & Safety Accessories
- Household goods and catering products
- Household appliances and personal care

CHERBIO TX PORTFOLIO

CHERBIO TX is available in:

- Transparent grades.
- Coloured grades, transparent and opaque, including piano black high gloss.
- Mar&Scratch resistant grades, UV resistant grades.
- Special aesthetic effects.

CHERBIO TX SPECIAL EFFECTS

CHERBIO TX is available in:

- **HARMONIA TX**, diffusing polymers
- **HILITE TX**, reflective and light blocking
- **BRIOS TX**, edge glow fluorescent
- **ECLIPSIA TX**, shine in darkness
- **METALLICA TX,** Metallic
- **LINX, i**rregular stained spotted effect

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PLASTIC FROM THE FUTURE