SCALING UP CHEMICAL RECYCLING AND THE ROLE OF CERTIFICATION

PLASTIC ENERGY®

A GROWING PROBLEM – A GROWING AWARENESS

The problem is not plastics per se, but plastic waste….

20x

The use of plastics has increased twentyfold in the past half-century

1M+

Every day more than 1 million tonnes of plastics are produced worldwide

8M+

Every year more than 8 million tonnes of plastic waste leaks into the ocean

14%

Only around 14% of plastic packaging is recycled worldwide (14% incinerated, 40% landfilled)

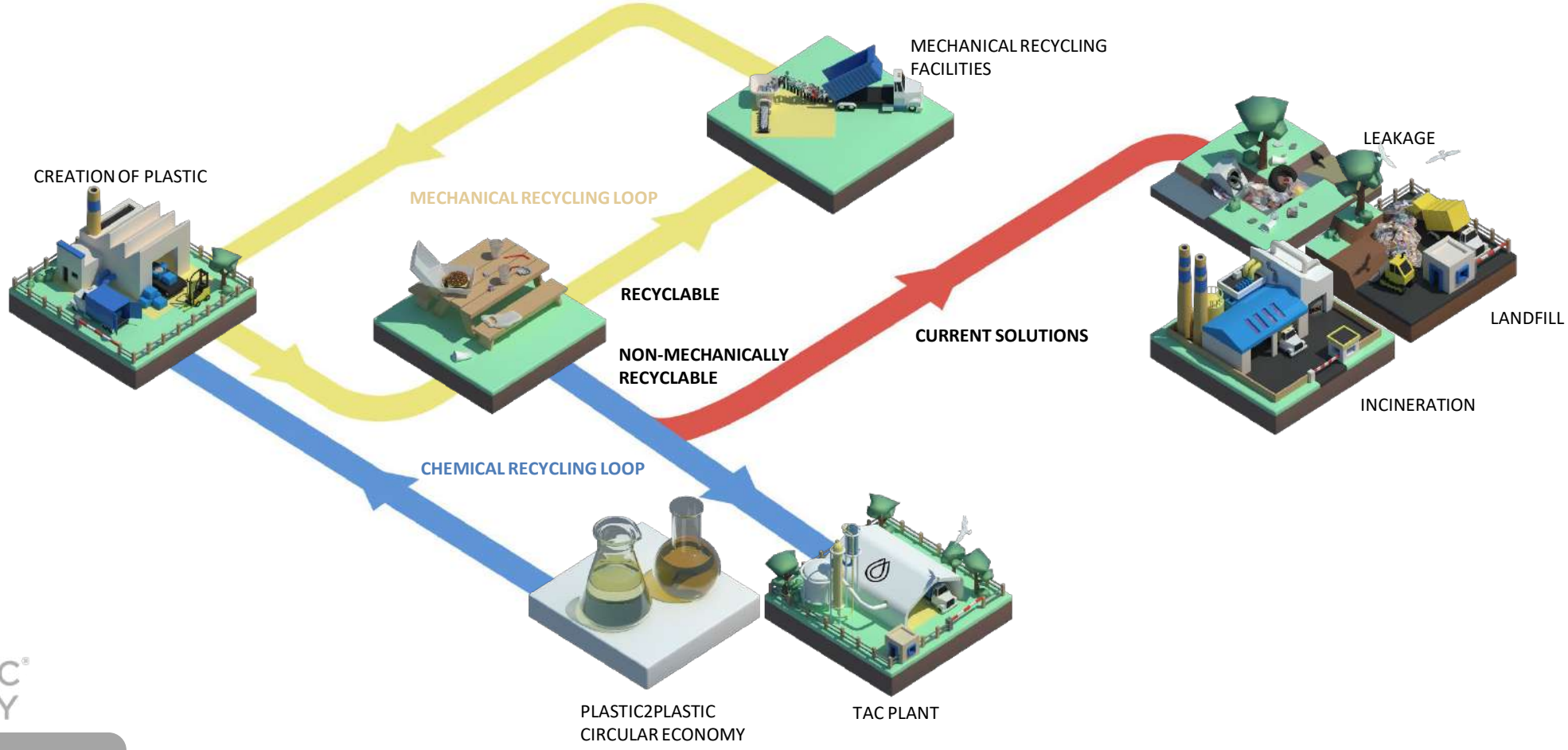
GROWING MOMENTUM TO TACKLE PLASTIC WASTE :

- Media campaign and societal awareness
- Chinese import restrictions
- Policies and voluntary commitments to increase recycling and improve waste management

CHEMICAL RECYCLING PROVIDES A SOLUTION

- Plastic Energy with its technology converts end-of-life plastic waste into hydrocarbon oils (TACOIL), to be used as a feedstock to make clean recycled plastics and create a circular economy.

- Chemical recycling complements mechanical recycling and overcome some of its challenges.



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WHY CHEMICAL RECYCLING?

Preventing pollution

Recycling more

Prioritizing highest waste management option

Increasing recycled content in food-grade materials

Developing and improving recycling infrastructure

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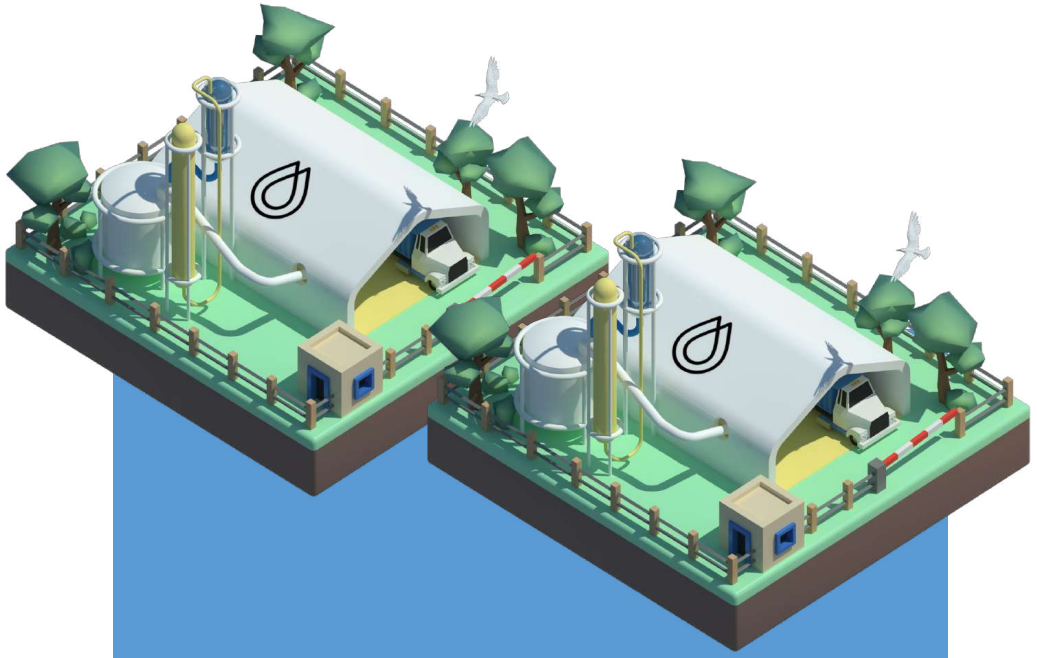
PLASTIC ENERGY – WHO WE ARE

INDUSTRY LEADER IN CHEMICAL RECYCLING
Convert end-of-life plastic waste into hydrocarbon oils.

PATENTED TECHNOLOGY
We have been developing for the past 10 years the Thermal Anaerobic Conversion



INDUSTRIAL PLANTS & OPERATIONAL EXPERIENCE
2 industrial and commercial plants operating for the past 3 years

PLASTIC2PLASTIC PROCESS
Only company to have validated and certified the Plastic2Plastic process for a circular economy of plastics

PARTNERSHIPS
Long-term partnerships with major industry players

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PLASTIC ENERGY – OUR MISSION

REDUCE POLLUTION
Improve waste management by diverting plastics away from landfills and incineration, and preventing leaks in our ocean

CIRCULAR ECONOMY
Contribute to closing the plastic loop

INCREASE RECYCLING
Support countries in reaching recycling targets by recycling previously non-recyclable plastics

HIGH-QUALITY RECYCLED CONTENT
Increase availability of virgin-quality recycled content suitable for food-grade products

REDUCE OIL DEPENDENCY
And the production of virgin plastics

ECONOMY
Boost local economies by building new plants and creating jobs

NEW PLASTICS ECONOMY Global Commitment

Plastic Energy signed the Ellen MacArthur Foundation New Plastic Economy Global Commitments

By 2025, Plastic Energy will convert at least 300,000 tonnes of low-grade plastic waste into feedstock for new plastic manufacturing (Plastic2Plastic).

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OUR FEEDSTOCK AND PRODUCT

Feedstock

- Mixed, multi-layered, contaminated plastic waste (within limits)
- No need to wash or separate by polymer-type

LDPE	PET
HDPE	PVC
PP	EPS
PS	Category 7

Product

- Each tonne of plastic waste chemically recycled will produce approx. 850 litres of TACOIL
- Output replaces fossil oil in the cracker

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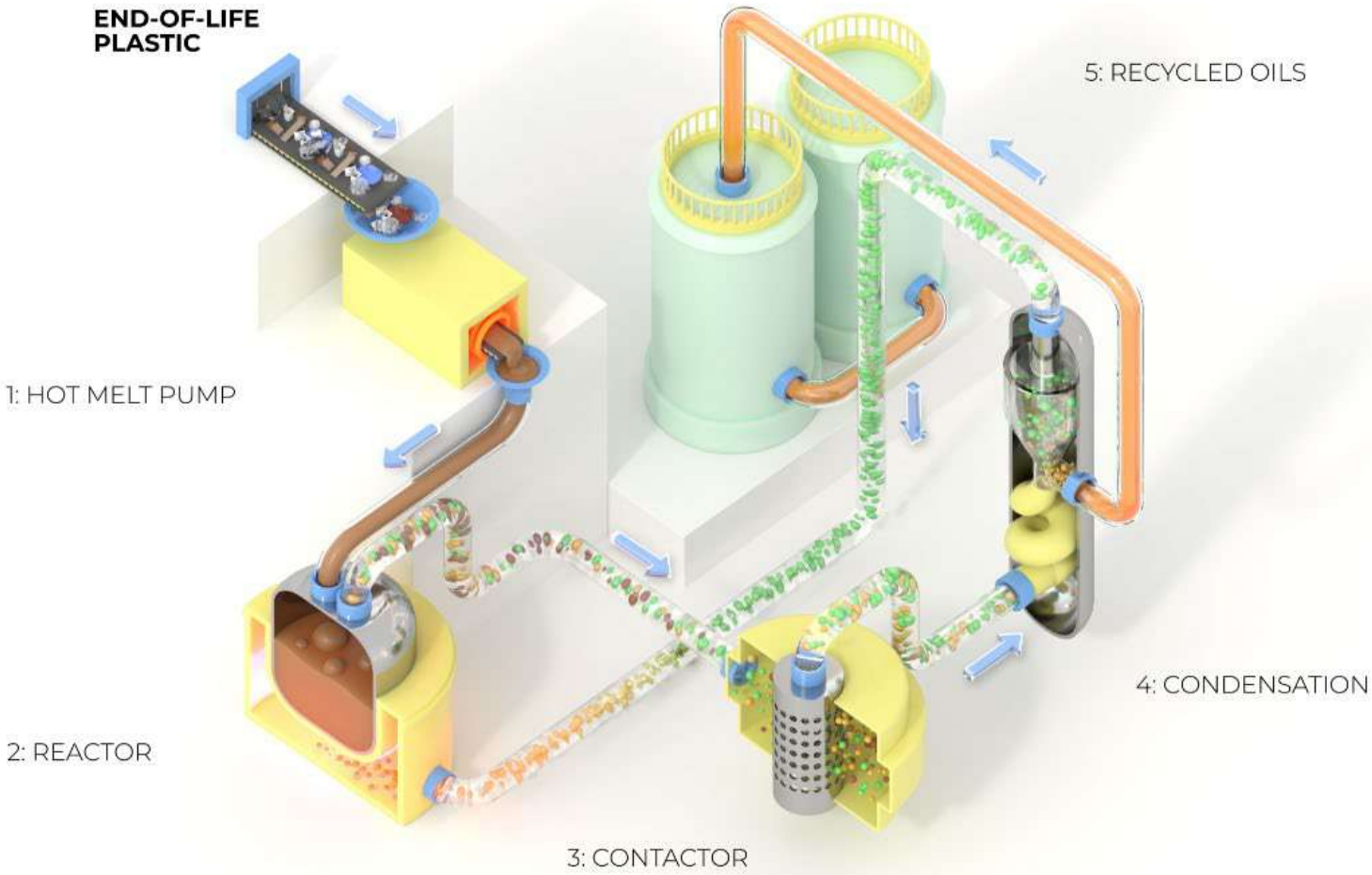
OUR TECHNOLOGY – THERMAL ANAEROBIC CONVERSION



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PROVEN RECORDS IN THE VALIDATION OF THE CIRCULAR ECONOMY – PLASTIC2PLASTIC

CERTIFIED CIRCULAR POLYMERS :

1ST company worldwide having validated & certified the circular economy of end-of-life plastics.

- Announced in Davos 2019
- Renewi, PLASTIC ENERGY, SABIC, Unilever / Vinventions / Walki Group / Tupperware
- Additional examples in 2020 include Berry / Mondelez
- Certified circularity and traceability by the ISCC+
- Recycled content following mass-balance approach

PROPERTIES:

- Alternative 'naphtha like' feedstock made from end-of-life plastic waste, replacing traditional fossil fuel in the manufacturing process
- Food-grade plastic packaging

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OUR CURRENT PLANTS – ALMERIA AND SEVILLA

PLANT CAPACITY

- We have two operational plants, in Seville and Almeria, Spain, that have been operational since 2015 and 2017

YIELD

- The approx. 72-75% TACOIL produced is sold to the petrochemical industry
- The approx. 18% syngas produced is used to power the plant and reduces the need for outside energy
- The approx. 8-10% Char produced is sold to the construction industry

100% of the TACOIL produced is now going towards the production of new products.

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DEMONSTRATION OF CLOSING THE LOOP - COMMERCIALISATION OF FOOD-GRADE PACKAGING WITH RECYCLED CONTENT FROM TACOIL

Food-grade Magnum and Knorr packaging from recycled content from Plastic Energy's chemical recycling plant, commercialised on the European market.

Traceability provided through circular plastic certification

ISCC
International Sustainability & Carbon Certification

Sealed Air

Plastic Energy to convert plastic waste from Sealed Air into new feedstock for Sealed Air to make recycled plastic packaging again.

Will include R&D of eco-design and recyclability of packaging to further develop the circular economy

New value chain collaboration with Sealed Air, petrochemical company SABIC, UK-based Tesco supermarkets, and Bradburys Cheese.

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VALUE-CHAIN COLLABORATION IS KEY TO THE SUCCESS OF CHEMICAL RECYCLING

- Chemical recycling has been the missing link until recently to make this process possible
- Demand for high-quality recycled content from brand-owners are driving the development and demand for chemical recycling
- Strong collaboration with feedstock providers and petrochemical companies are essential to ensure alignment of specifications

Plastic waste

Feedstock provider
Sort the plastic waste to reach Plastic Energy feedstock specifications

TAC plant
Convert plastic feedstock into hydrocarbon oils - TACOIL

Petrochemical company
Produce Certified Circular Polymers from TACOIL

Converter & Brand-owners
Incorporate the recycled plastic into new product to be commercialised on the market

RECYCLED AGAIN AND AGAIN

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PLASTIC ENERGY – LIFECYCLE ANALYSIS

We recently received results of our independent LCA from sustainability consultants, Quantis.

KEY POINTS:

- Plastic Energy's process has a considerably **lower climate change impact than incineration with energy recovery.**
- Plastics made from Plastic Energy's recycling process have a **lower climate change impact than virgin plastic.**
- Combining chemical recycling efforts with mechanical recycling efforts will **greatly reduce the environmental impact of plastic.**
- We expect **improvements in the energy efficiency of the chemical recycling process in the near future.**

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INNOVATION IN CIRCULAR ECONOMY LEADING TO AGREEMENTS WITH KEY PARTNERS

Almeria (SP)

- Plant commissioned in 2015.
- First one in Europe with the REACH certificate.

Seville (SP)

- Plant operating since 2017
- Increase the capacity of Seville plant in 2022

Tenerife (SP)

Expected to be operational in 2022

- Sustainability project

UK

Signed: Q2 2020

Viridor

France

Signed: Q3 2020;

TOTAL

Geleen (NL)

Signed: Q4 2018; Operating: 2022

sabic

Malaysia

Signed: Q2 2019; Operating 2023

PETRONAS

Indonesia

- MoU signed in West Java for the construction of 5 plants

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Other partner for plant in Europe: INEOS

...and many more in the pipeline

OUR GROWTH

“

We will be building 10 chemical recycling plants by 2025.

Carlos Monreal – Founder and CEO of PLASTIC ENERGY

”

Minimal capacity of the new generation plant:
20,000t/a of plastic processed

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WHY ISCC PLUS CERTIFICATION?

Demonstrate product traceability from ELP

Give trust to stakeholders

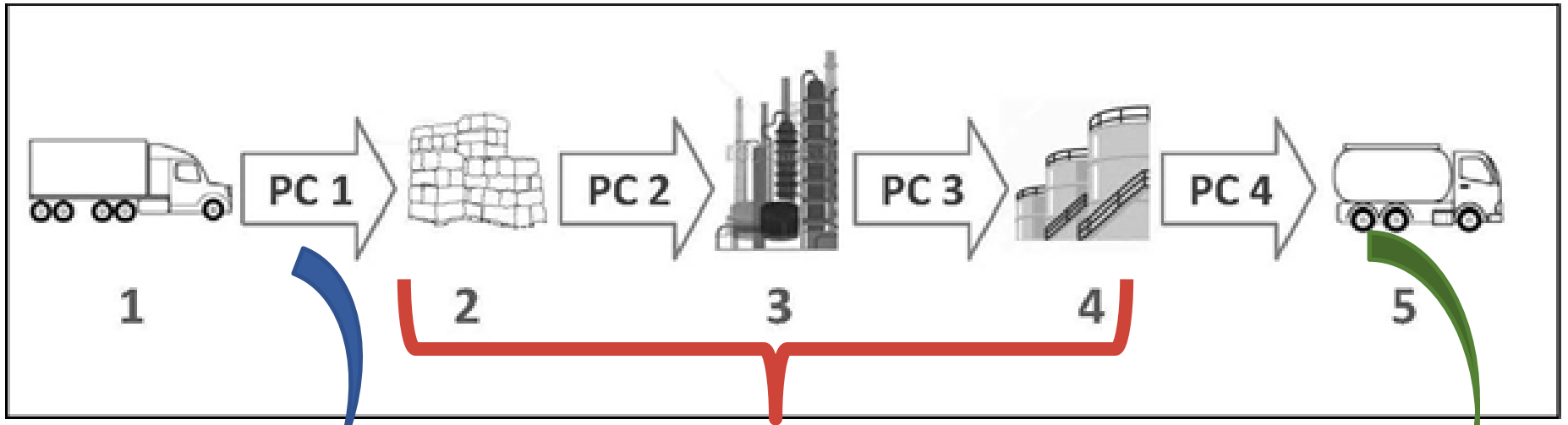
Required by main customers

PLASTIC ENERGY ISCC PLUS MANAGEMENT SYSTEM

KEY POINTS:

- We worked hand in hand with ISCC to develop the standard for waste plastic
- We are considered Collecting Point and Processing Unit
- Scope: only end-of-life plastic feedstock (supplier Self-Declarations)
- Chain of custody: physical segregation
- Incorporated into the company's Quality Management System
- In our case, easy to implement due to our previous internal Excise Tax accounting system (production is strictly controlled by the Excise Tax Agency)

PLASTIC ENERGY ISCC PLUS CERTIFICATION PROCESS



- End-of-Life Plastics
- Self-Declarations

1st Waste Plastic Conversion Facility with ISCC Certification

- Management Manual
- Policy
- Procedures (traceability and quantities register)
- Document Control
- Organisation
- Training
- PHYSICAL SEGREGATION

- SUSTAINABILITY DECLARATION

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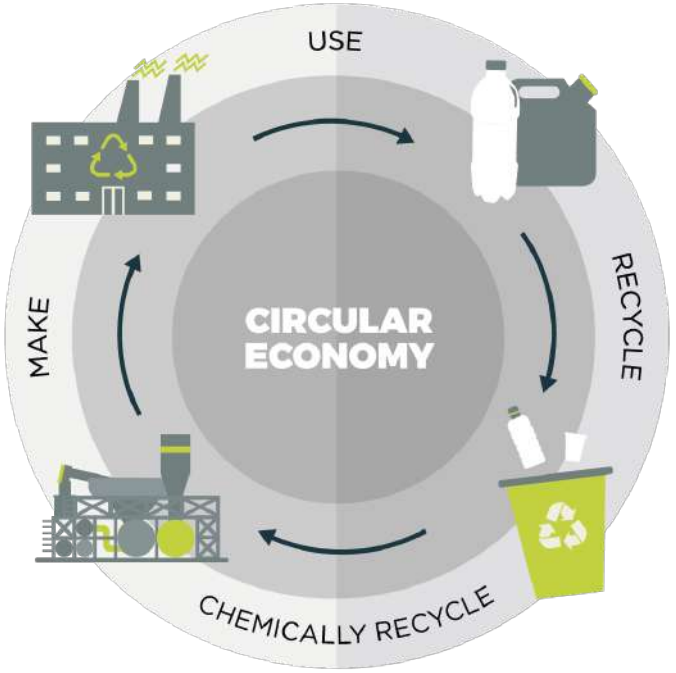
PLASTIC ENERGY ISCC PLUS CERTIFICATION

BENEFITS:

- **First company** in the chemical recycling sector certified according ISCC PLUS standard
- Availability of **records to demonstrate the sustainability of our products** throughout the chain of custody (Sustainability Declarations)
- **Promote the circular economy** through an external and independent certification system

Internally:

- It helped us to improve the identification of the stored batches
- Learn more about the behavior of the technology before different plastic feedstock, based on **internal traceability studies**



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