



ACCELERATING ENERGY TRANSITION

Agenda

ABOUT US
ENVIRONMENTAL
GRT SOLUTION
TODAY
TOMORROW
CONCLUSION

History and numbers

1971

Company foundation by Dr. Alain Jenny as an R&D group, focusing on industrial development of innovative processes developed in research laboratories at EPFL and other universities.

2004

Reinforcement of engineering capabilities in order to be able to provide innovative industrial solutions in the field of pollution and waste management.

2014

Strengthening of financial position with new shareholders, who contributed to directly finance industrial operations and processing of non-recyclable waste materials projects.

2016

Aquisition of 35% of PROIL

2017

Creation of GRT Italia and GRT Britannia to expand activities in Italy and UK.
World first integrated Formic Acid Fuel Cell demonstration unit developed in Grt labs and proved as efficient electricity production system.

2018

More than 45 years of experience



Vision

Some of the most relevant challenges for mankind today concern the reduction of human footprint on the planet and the preservation of the environment for future generations.

In this context GRT Group intends to be an active player in the circular economy industry, fuelling the green industrial revolution, through the application of innovative technologies.

GRT Group vision is the commitment to address 3 major environmental challenges:

- Reduce CO₂ emissions,
- Reduce Plastic waste littering,
- Enable Energetic transition;

by providing technological solutions for present and future.

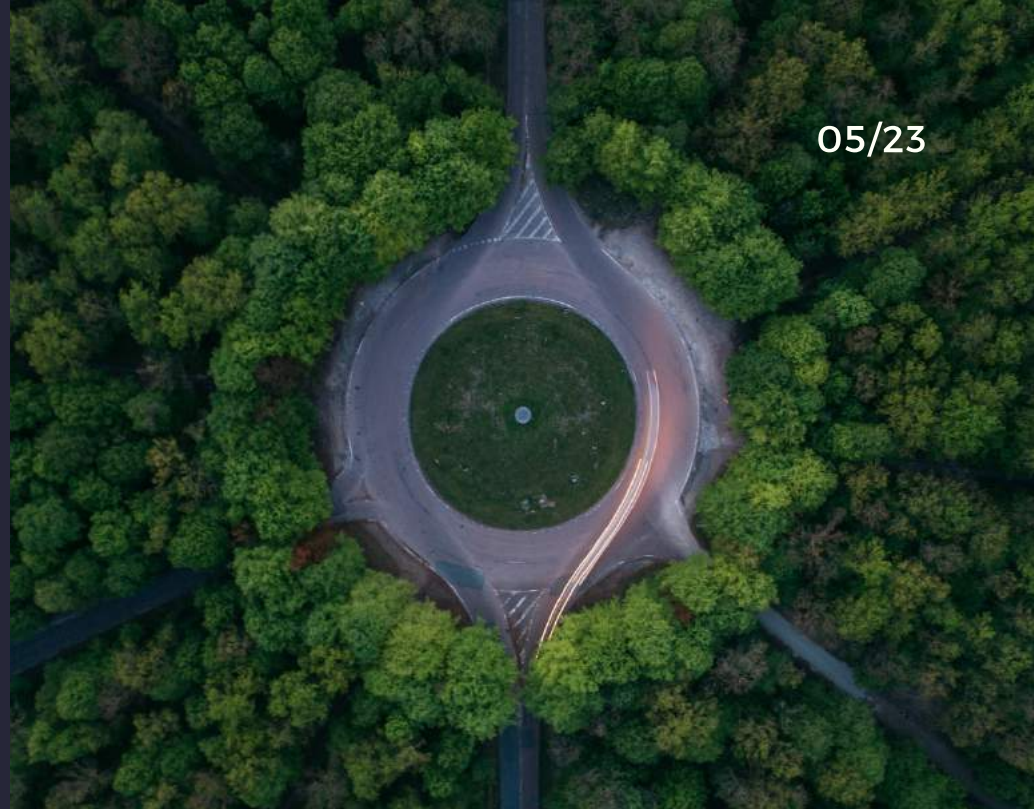
Values

Ethics and Environment first

Continuous innovation
through R&D on circular
economy technology and
processes

Leadership through excellency
in processes, people
competences and skills
enhancement

Responsibility to future
generations and local
communities



Mission

For over 45 years, GRT Group has pioneered and boosted scientific and industrial approaches by developing original technologies in the sustainable economy sector.

The mission of GRT Group is to implement, at full industrial level, innovative technologies, in the circular economy environment.

**To reduce
CO₂ emissions**

**To eliminate
environment
littering**

**To enable
energetic transition
from fossil fuels to
renewables**



**To reduce earth
limited resources
exploitation**

**To extract Value
from waste, reducing
local pollution and
damages to the
oceans ecosystems**

**To be Responsible
towards local
communities**



08/23

CO₂ emissions

ENVIRONMENTAL

Global CO₂ emissions set to rise by 2% in 2017.

Main consequences:

Global warming -> desertification, sea level rise, stronger storms and extreme events;

Ocean acidification -> world's oceans 30% more acidic since the Industrial Revolution.



Environment littering

ENVIRONMENTAL

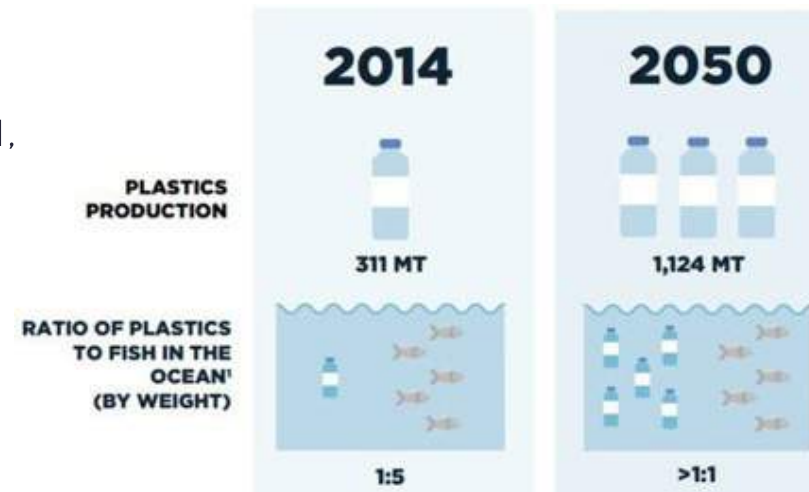
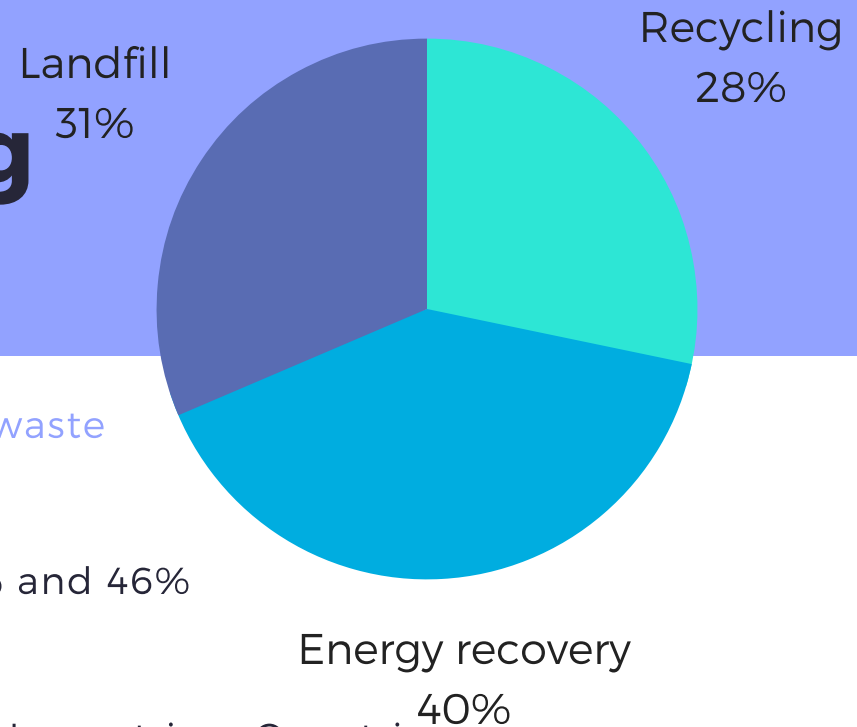
In 2014, 25.8 million tons of post-consumer [plastics waste](#) ended up in the official waste streams.

Since 2006 recycling and recovery increased by 64% and 46% respectively. Landfill decreased by 38%.

In 2014, landfilling was still the 1st option in many EU countries. Countries with landfill ban (AUT, BEL, CH, DK, GER, LUX, NL, NOR, SWE) achieve higher recycling rates.

When not properly disposed, plastic waste ends up as litter in the environment, [harming wild life, fisheries and tourism](#).

Marine Litter has become a [global challenge](#). Since 2011, 65 associations in 34 countries have signed on to the Global Declaration for solutions on Marine Litter. 260 projects are underway, planned or completed since.



Energetic Transition

ENVIRONMENTAL

80% of global energy today comes from fossil fuels.

The intermittent nature of renewable energies creates the need for energy storage in order to allow their use on large scale.

11/23

How do we address environmental issues

TODAY AND TOMORROW

CO₂ emissions

Environment littering

Energetic transition

2
TECHNOLOGIES

Plastic to fuel

To produce liquid fuel with non-recyclable plastics and renewable energy

Energy to storage

To store energy from renewables through Liquid Fuels: LOHC or Bio-diesel

An integrated strategy

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TODAY AND TOMORROW

GRT Group is committed to transform non-recyclable plastic into valuable fuel and to accelerate the energy transition via a new concept of energy storage.

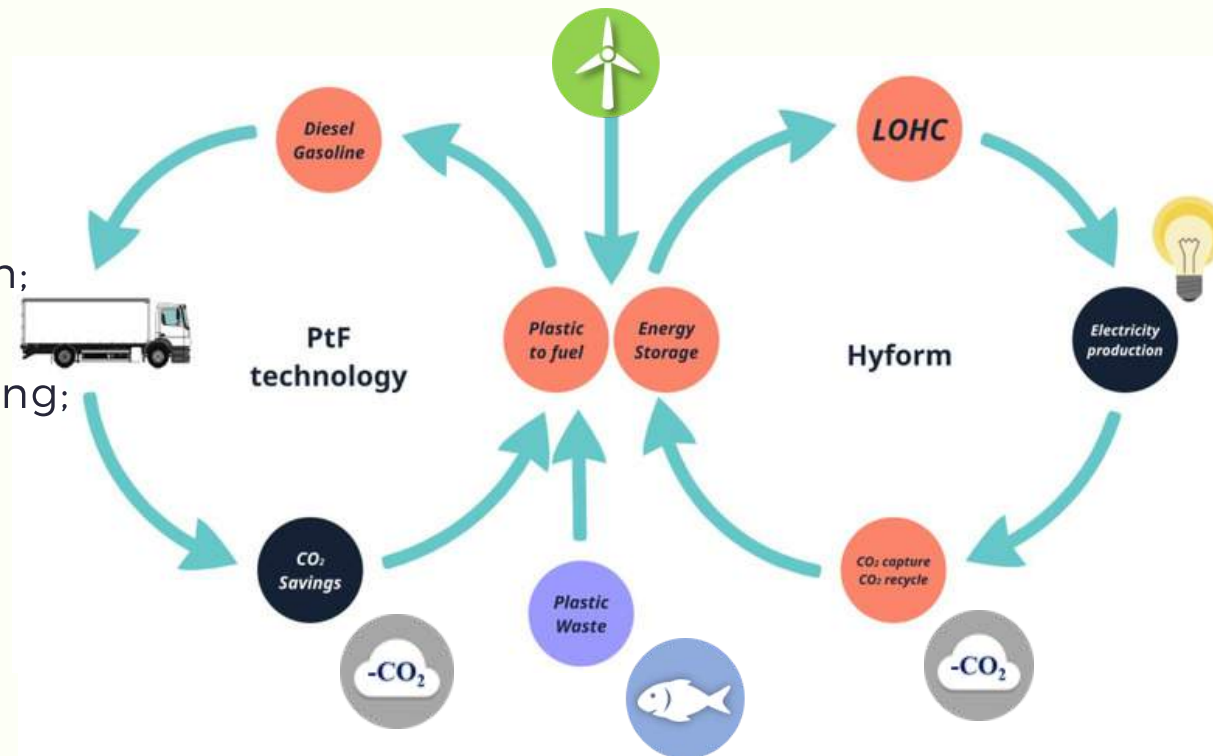
These represent efficient solutions for today and tomorrow, addressing the issues of:

CO₂ emissions reduction;

environment littering reduction;

and energetic transition enabling;

in order to preserve the environment and to allow our economy to move to an economically efficient sustainable model.



Plastic to fuel

TODAY

Non-recyclable plastic waste



Renewable energy



are converted into ready to use **liquid fuels** through a thermal conversion process.



Plastic to fuel: how it works

TODAY



Inputs:

renewable electricity



Non-recyclable waste plastics

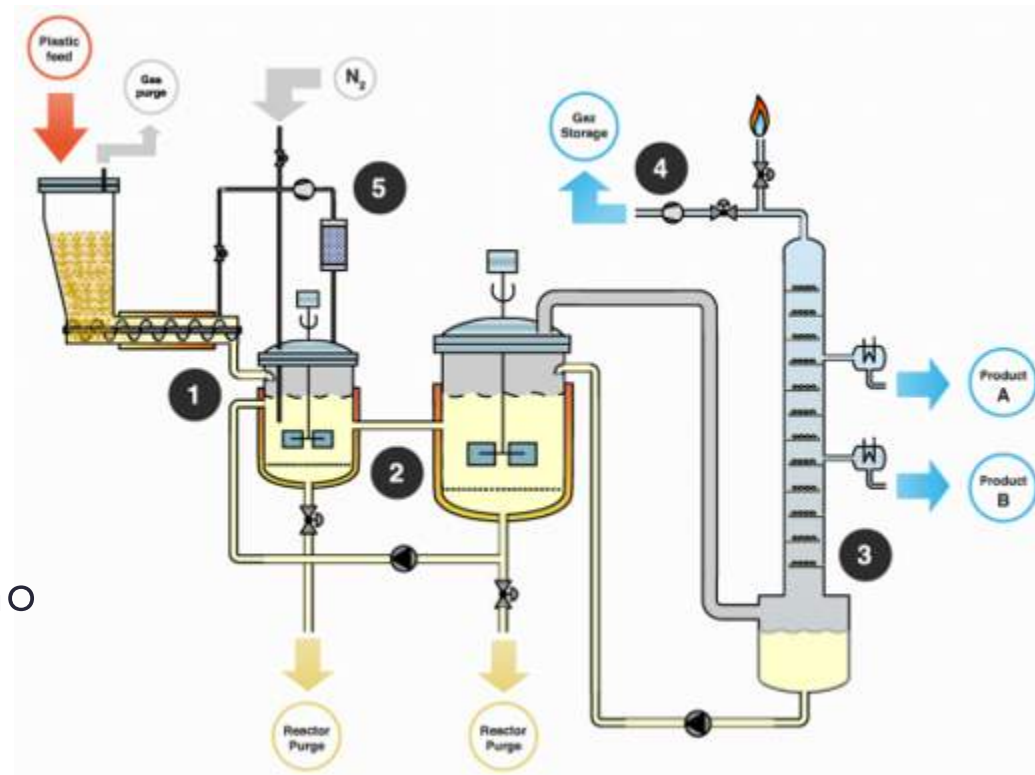
Outputs:



Liquid low-carbon fuels
(Diesel, gasoline)

Syngas: process energy when no
renewable energy available

Char: used in agriculture,
construction, cementeries

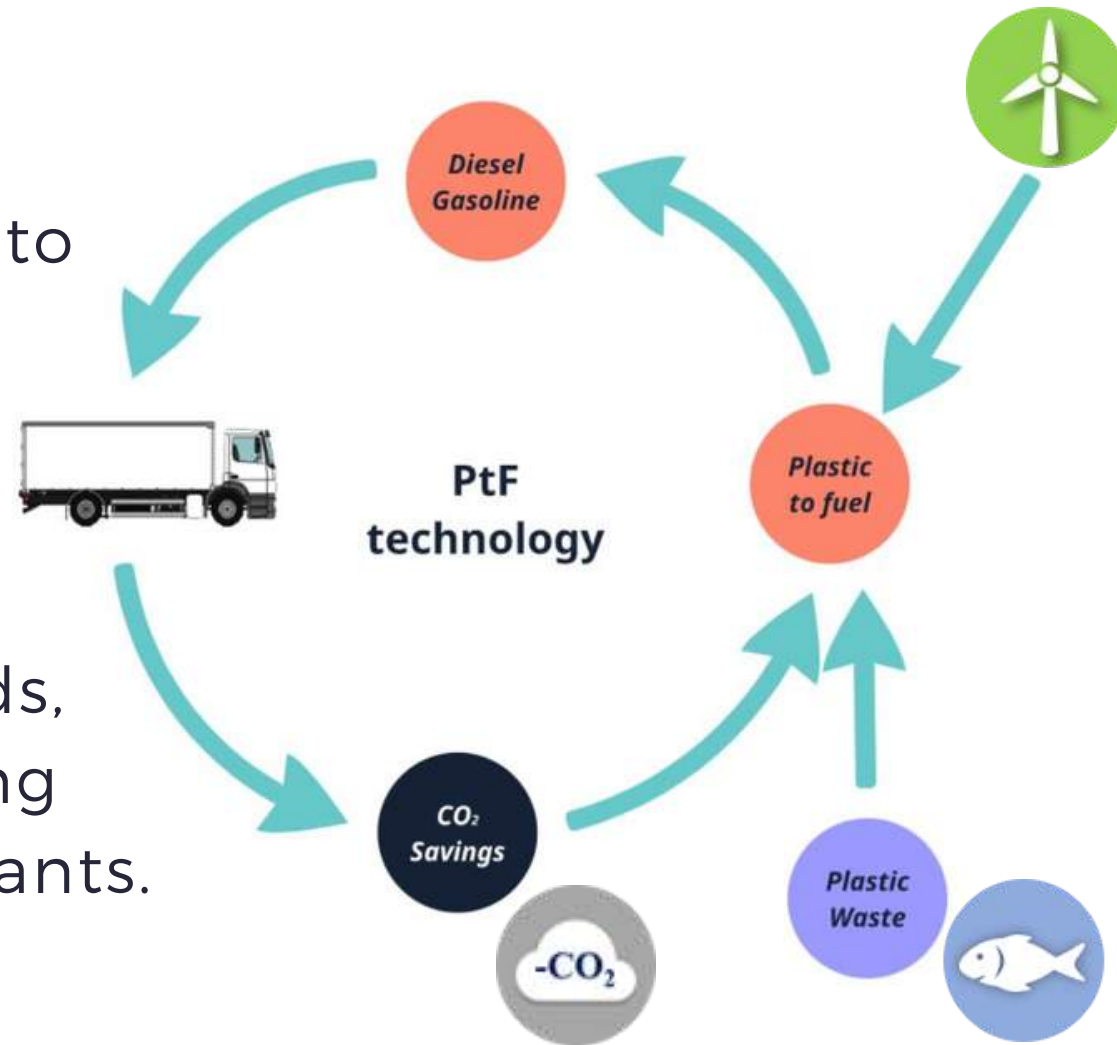


Fuel produced as a way to store energy

TODAY

Energy, from waste and renewables, is stored into liquid fuels.

Fuel produced is compliant with transportation standards, it can be used in existing engines or industrial plants.



Environmental gains

TODAY



Promote recycling by increasing the value of waste

Waste plastics are not landfilled and will not leak into the environment,



Store renewable energy,



Local production: no need for extraction, refining and transportation,

low sulphur content,

70% CO₂ savings compared to fossil fuels, no incineration of waste plastics.

Energy storage for energetic transition

TOMORROW

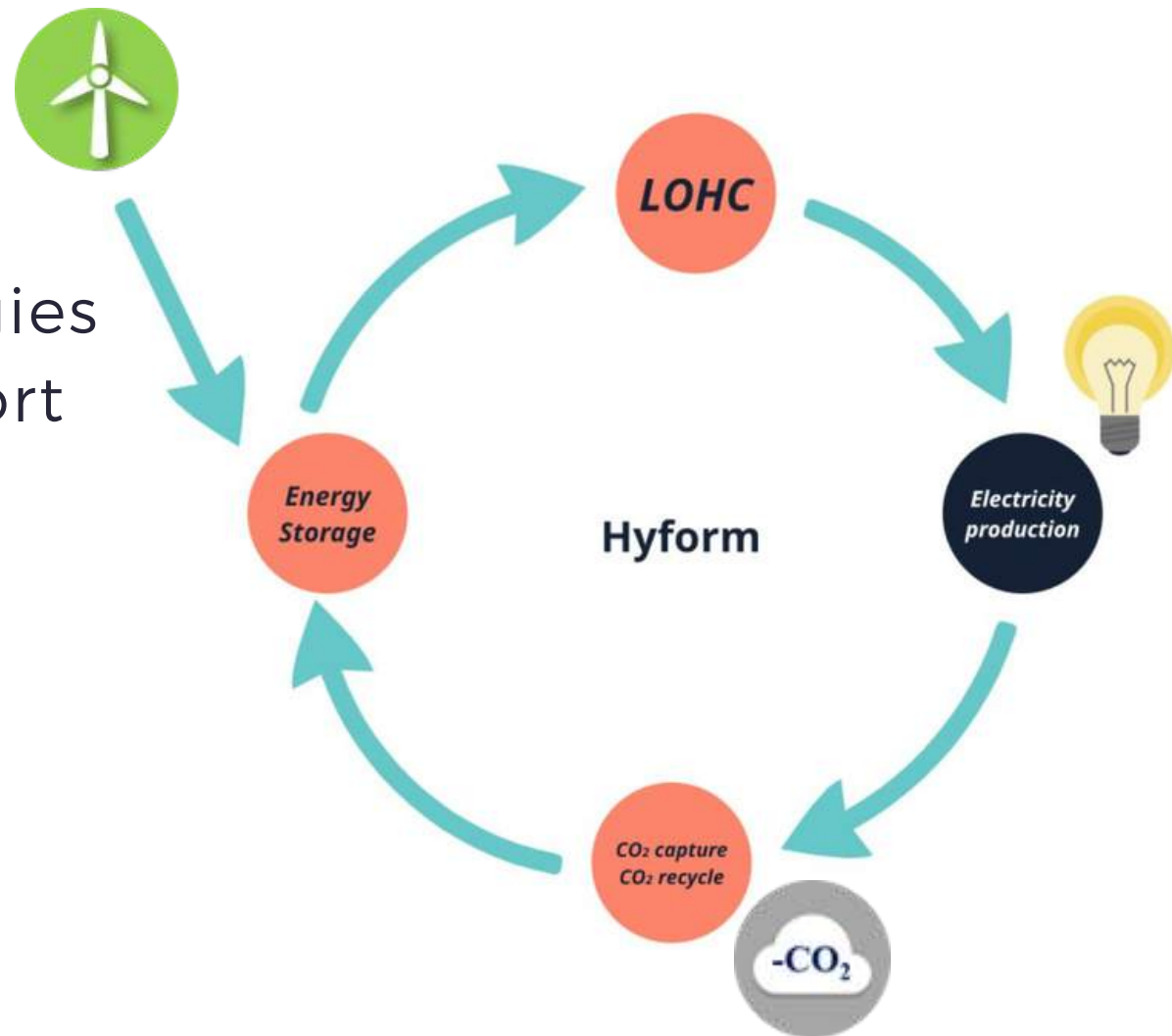
Efficient storage methods for renewable energies
are mandatory
to enable a transition
from fossil to renewable energy



The circular energy

TOMORROW

We develop technologies to support the transport and production of Hydrogen, for a clean environment.





GRT Technology status

TODAY

Conversion of Formic acid into hydrogen
Conversion of Formic acid into electricity

We successfully demonstrated efficient electricity production from formic acid and hydrogen fuel cell.

Current applications

easy and safe transportation of hydrogen in a LOHC (Liquid Organic Hydrogen carrier)

Off-grid power generation demonstration unit



Additional storage mgt capability

FURTHER DEVELOPMENT IN OUR PIPELINE

Combining renewable energy and CO₂ to produce a LOHC

Future applications

Innovative efficient high pressure Hydrogen delivery for transport.

Seasonal/Long term energy storage, allowing stable large scale renewable energy use.

Carbon capture



Environmental gains

OUR LONG TERM TECHNOLOGY VISION



Complete energetic transition from fossil to renewable energy made possible through:

- Long term energy storage;
- Transport of Hydrogen: support Hydrogen economy implementation;
- Green industrial revolution.



- no CO₂ emission.
- CO₂ capture for Hydrogen storage.

Conclusions

Our company values are based on Ethical and Sustainable Economy Model looking at long term benefits for all stakeholders : from the environment to local communities.

Rethinking consumption models, moving to a circularity principle is key for GRT Group, that develops plants to transform non recyclable plastic waste into liquid fuels/liquid energy vectors.

The GRT plastic to fuel solution addresses major environmental issues of today.

The GRT energy to storage R&D enables a sustainable future, replacing fossil fuels by efficient renewable solutions accelerating energy transition.

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