



# MADE

Microwave Assisted DEpolymerization



# What happens when you put together a bunch of technical people?



**Dr. Maurizio  
Crippa**

*Founder & CEO*

- PhD in Material Science
- 15 years of experience



**Dr. Matteo  
Parravicini**

*Founder & COO*

- PhD in Chemistry
- 10 years of experience



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*CFO*

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**Dr. Fabio  
Silvestri**

*CMSO*

- MBA from MIP
- PhD in Material Science



**Dr. Alessandro  
Sanzone**

*Head of R&D*

- PhD in Chemistry

# The problem of 21<sup>st</sup> century | Plastic Waste



- “**460 million metric tons** of plastics were used in 2019, a number that nearly doubled since 2000”
- "After taking into account losses during recycling, **only 9% of plastic waste was ultimately recycled**, while **19% was incinerated** and almost **50% went to sanitary landfills**,"
- "The remaining **22% was disposed of in uncontrolled dumpsites**, burned in open pits or leaked into the environment”

Source: OECD.org



# Breaking down the problem

**~90M  
tons**

Polyester is the most used polymer after polyethylene, with application that spans from packaging to textile.

**~60M  
tons**

Polyester fibers represent more than 50% of the total fiber production, and more than 2/3 of the total polyester production worldwide.

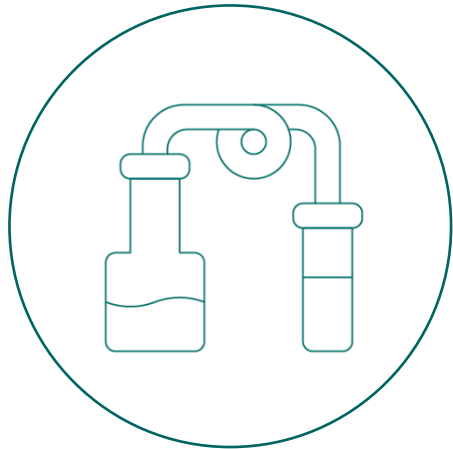
**0-8 %**

Nowadays almost no polyester fibers are upcycled (mainly due to technological limitations) and just a small amount of PET from packaging.

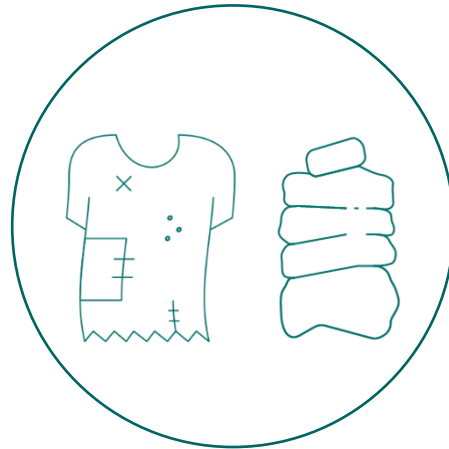


Source: Textile-Exchange\_PREFERRED-Fiber-and-Materials-Market-Report\_2021

# Solution | MADE -**M**icrowave **A**ssisted **D**epolymerization-



A technology able to treat what **mechanical recycling** is **not able** to

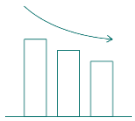


A process that is independent from the **feedstock**, from **polyester blends** to **packaging**



A way to go back to TPA and MEG and **completely avoid** polyester **incineration** and **landfilling**

# MADE by gr3n | How the process works



Depending on the energy source used to power the plant, the **CO<sub>2</sub>** impact can be **reduced** to more than 60%



Electrolysis is the enabling technology to make the process **circular** and **profitable**



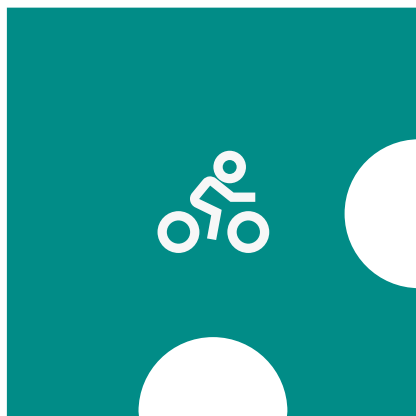
The **output** of the de-polymerization plant are **TPA** and **MEG**, that can later be re-polymerized to close the loop



# Why MADE

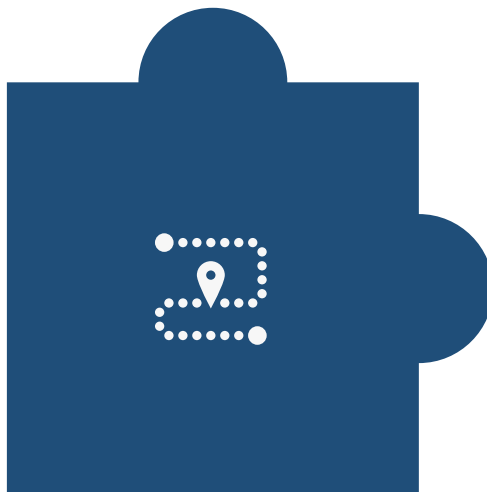
## Faster

Full **de-polymerization** in approximately **10 minutes**, allowing a **continuous process**



## Flexible

**Robust** contaminant **purification** process (up to 30%)



## Economically Sustainable

**-67% energy\*** used, and **-64% CO<sub>2</sub> emission\*** compared to monomer production from fossil fuel



## Easily scalable

13K tons/year reactive unit, to **easily increase the capacity** from 10 up to the desired one



# About Us



## VISION

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**Every polymer**  
(must be considered) **as a source**, using it as an alternative to producing monomers and then again polymers, towards effective circularity.



## MISSION

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**Eliminate plastic waste** issues on a global basis offering plastic producers and recyclers a **profitable way** to treat plastic waste and enabling them to close the loop through chemical recycling.



## VALUES

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**Passion**  
**Scientific Approach**  
**Diversity**  
**Accountability**



# What we have done so far| R&D Hub

The R&D facility near Chiasso can pre-treat the material, both packaging and textile, depolymerize it and even polymerize the recycled TPA and MEG using our pilot and demo scale reactors.

## Org. Chem. lab and characterization

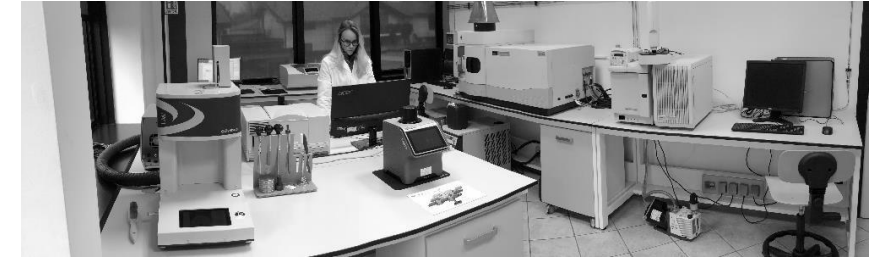
- GC-MS
- ICP-OES
- FTIR (ATR)
- UV-Vis
- DSC
- Plastometer
- Colorimeter
- Bench microwave reactor

## Depolymerization

- Shredding machine
- 20 kg/batch

## Polymerization

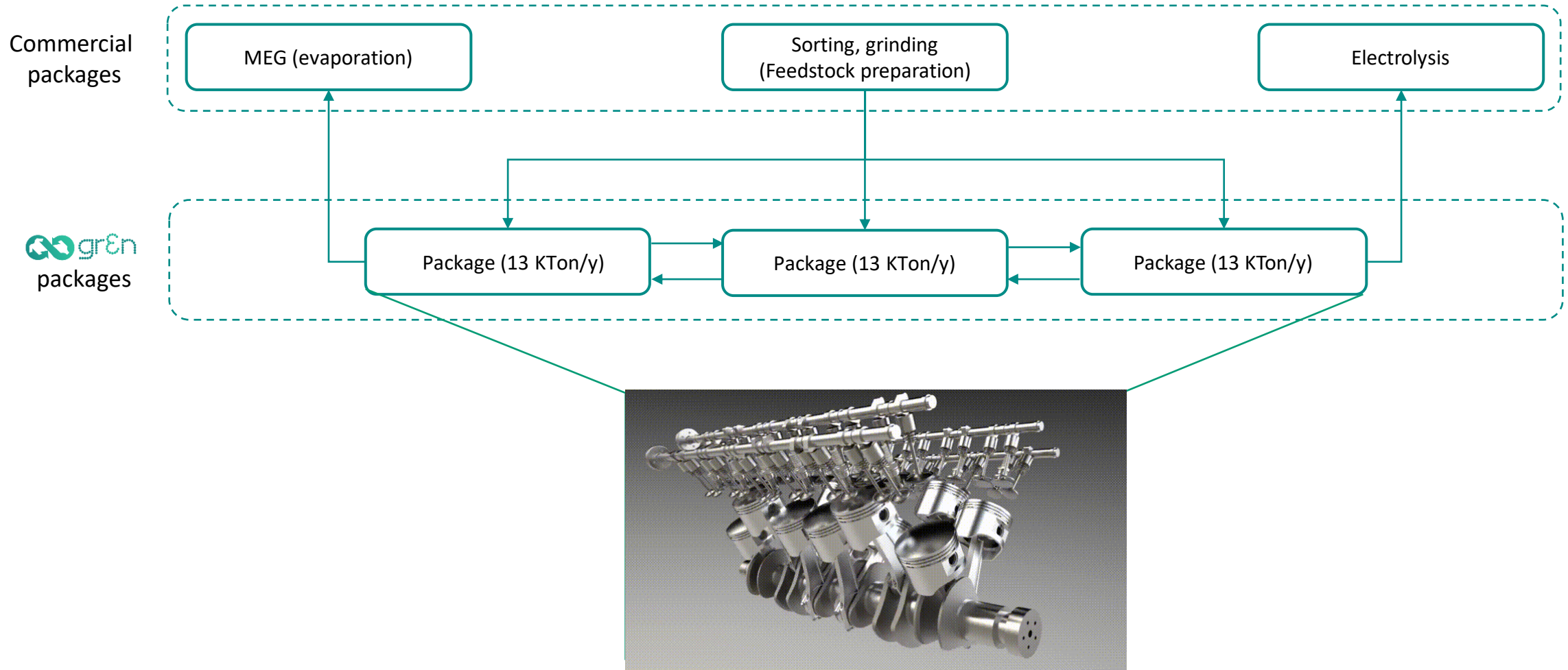
- ❖ 30 kg/batch
- ❖ 500 kg



# Some of our tests

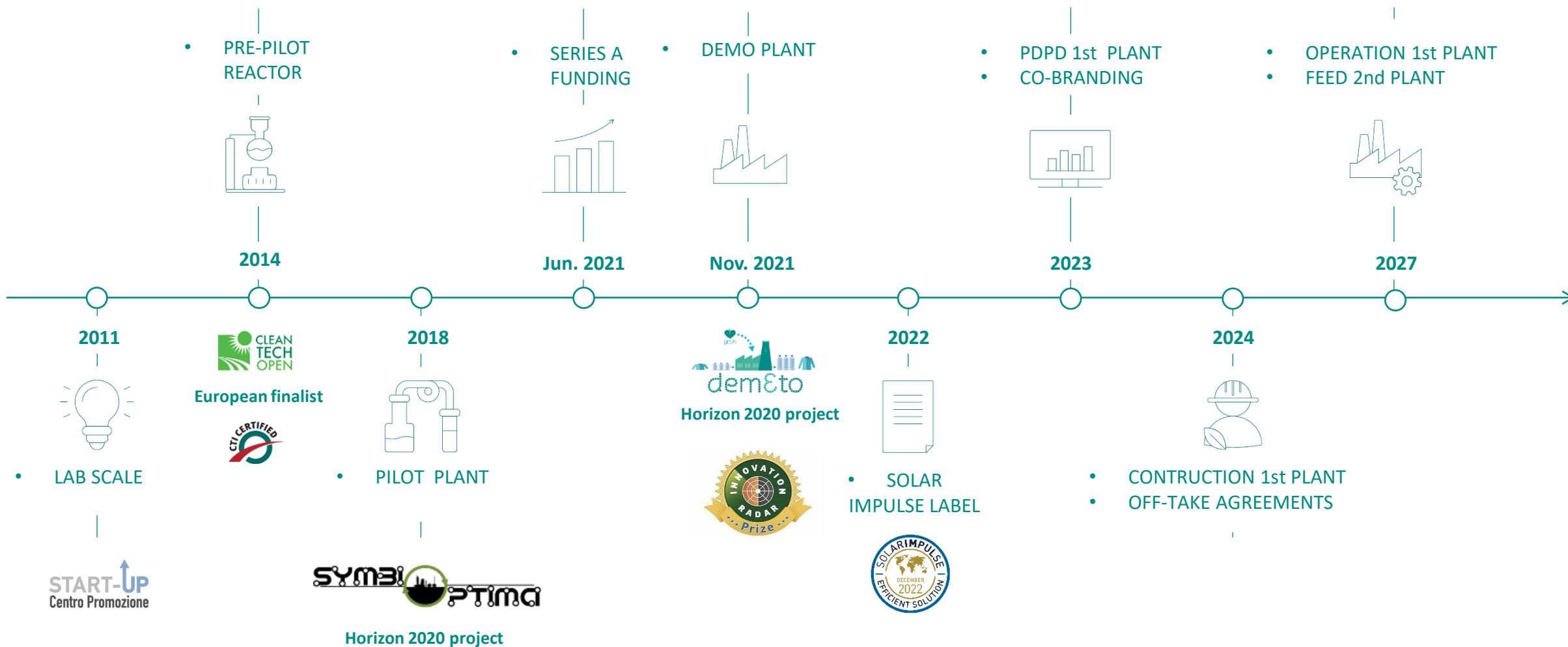


# The industrial Package(s)

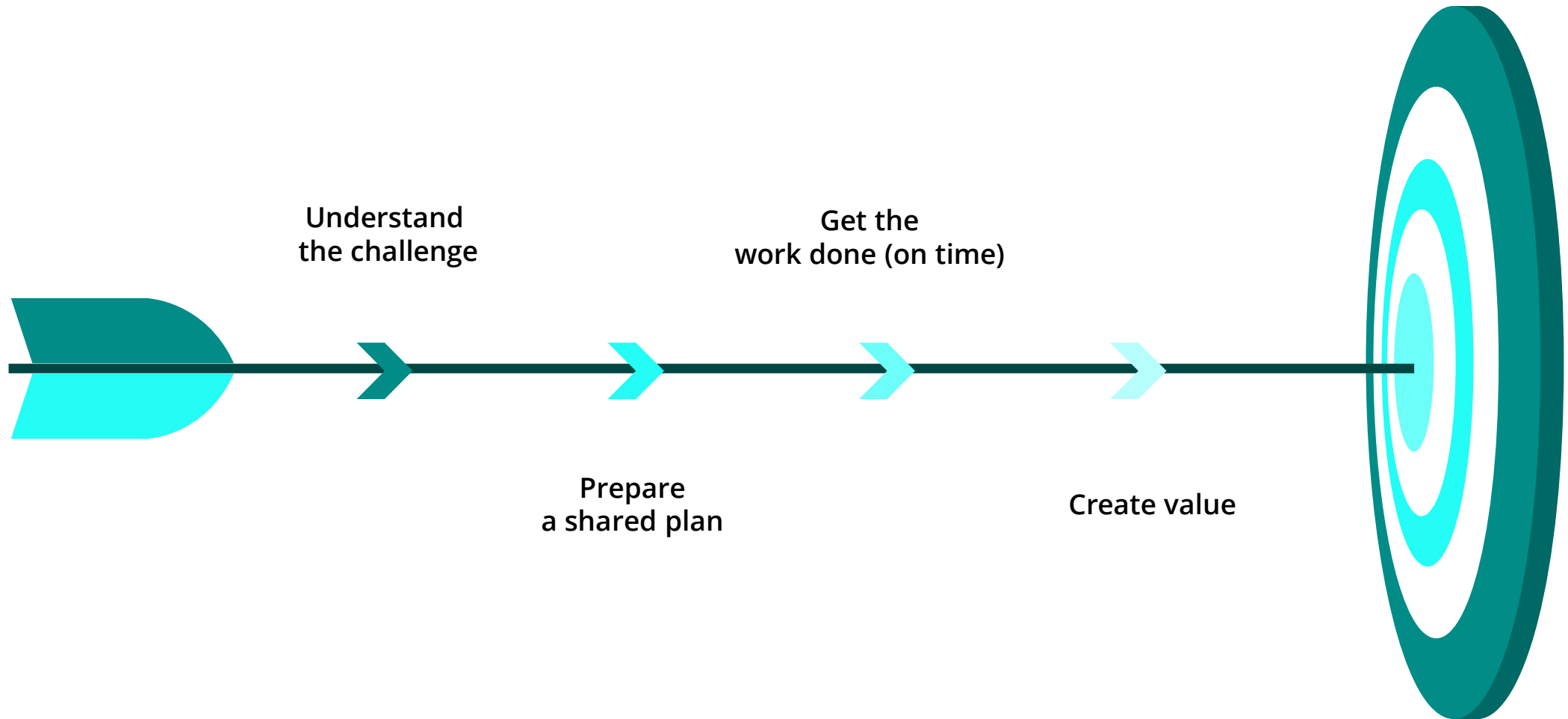




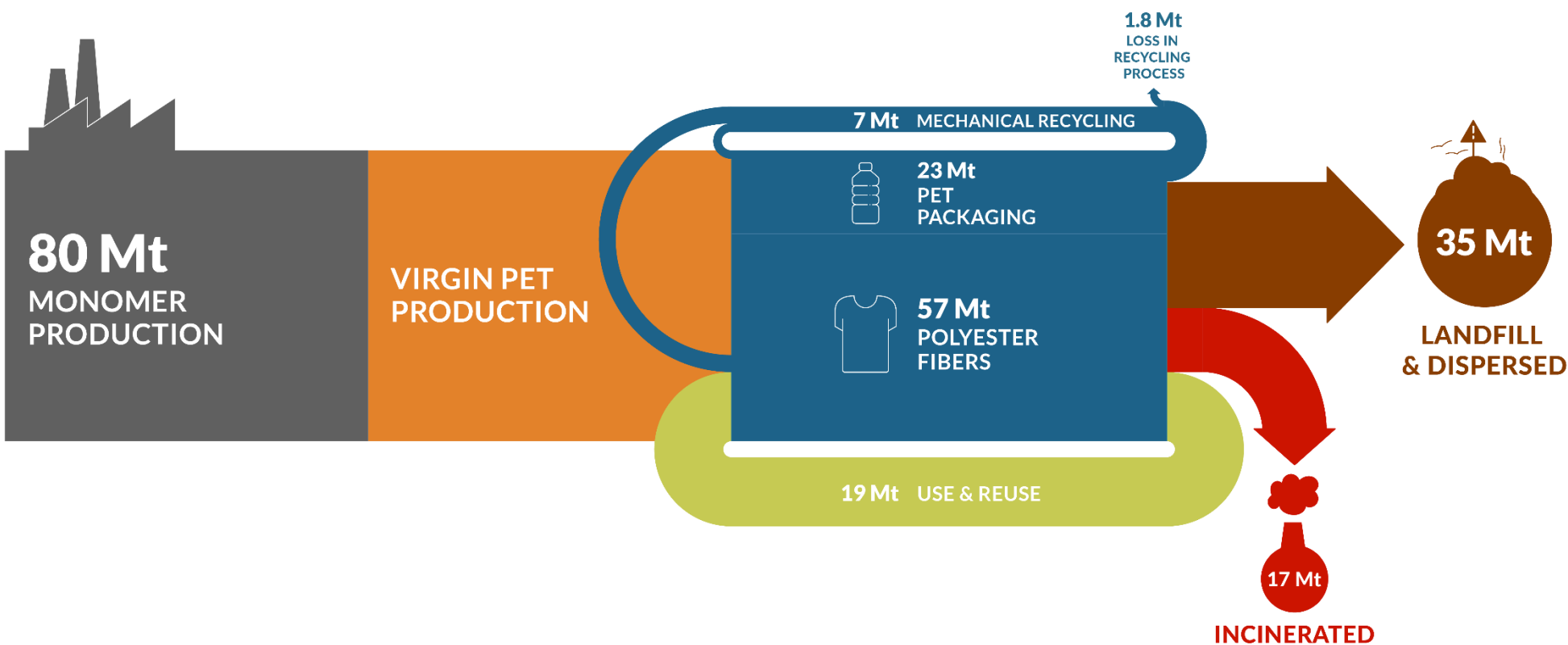
# Gr3n Timeline | What, When, How



# How to collaborate



# The gr3n way





# The gr3n way



# Contact US

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