ZERO WASTE EUROPE

# Chemical recycling & recovery

## Environmental impact and how to legislate

zerowasteeurope.eu

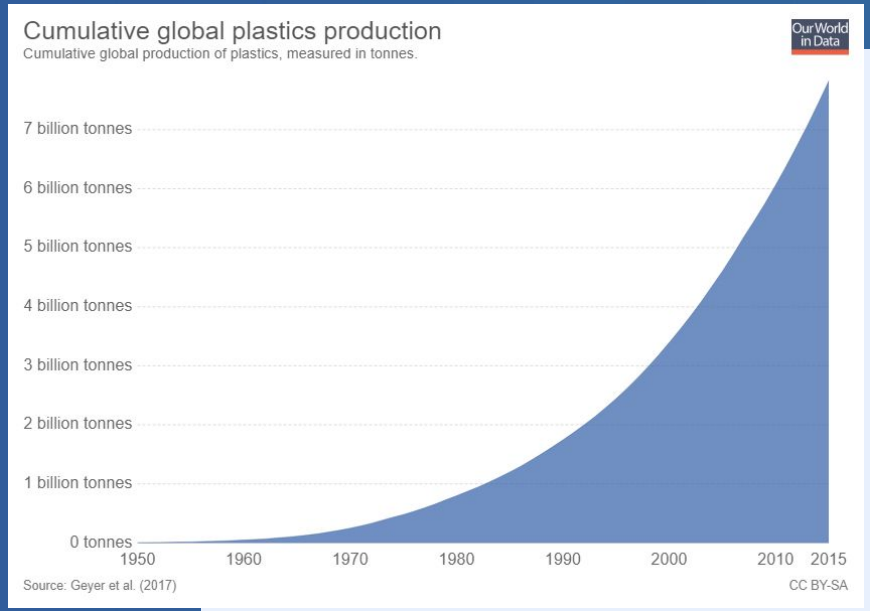
# Zero Waste Europe

Support NGOs, local groups and communities

Change European Policies

Mentor cities towards a Zero Waste transition

## European network for a circular economy



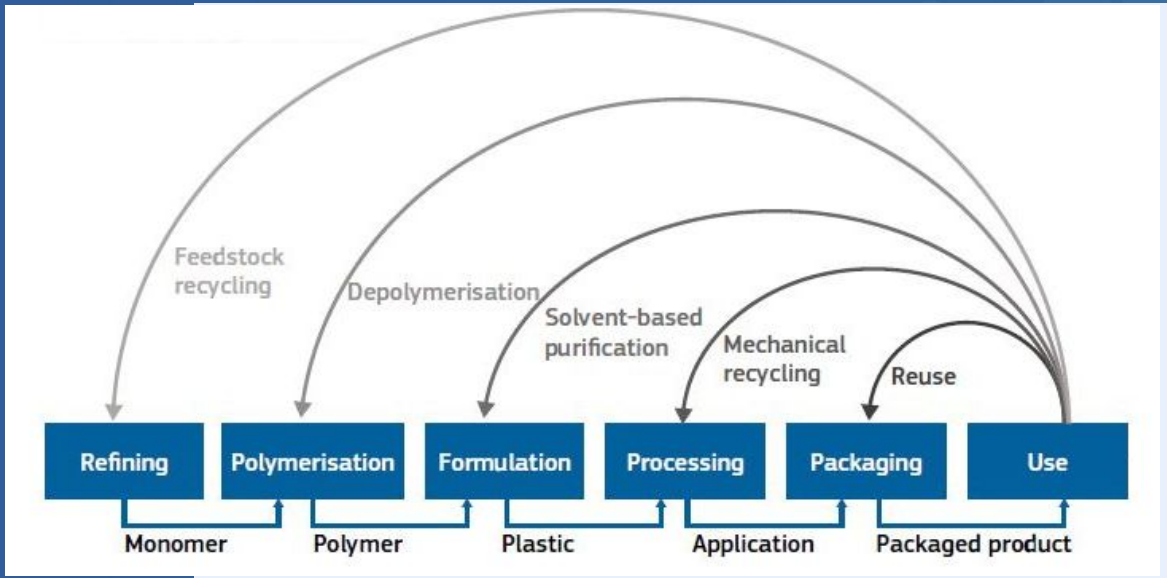

## What role does recycling play in a circular economy?

Global plastic waste volumes

- 2016: 260 M tons
- 2030: 460 M tons (with current trajectory)

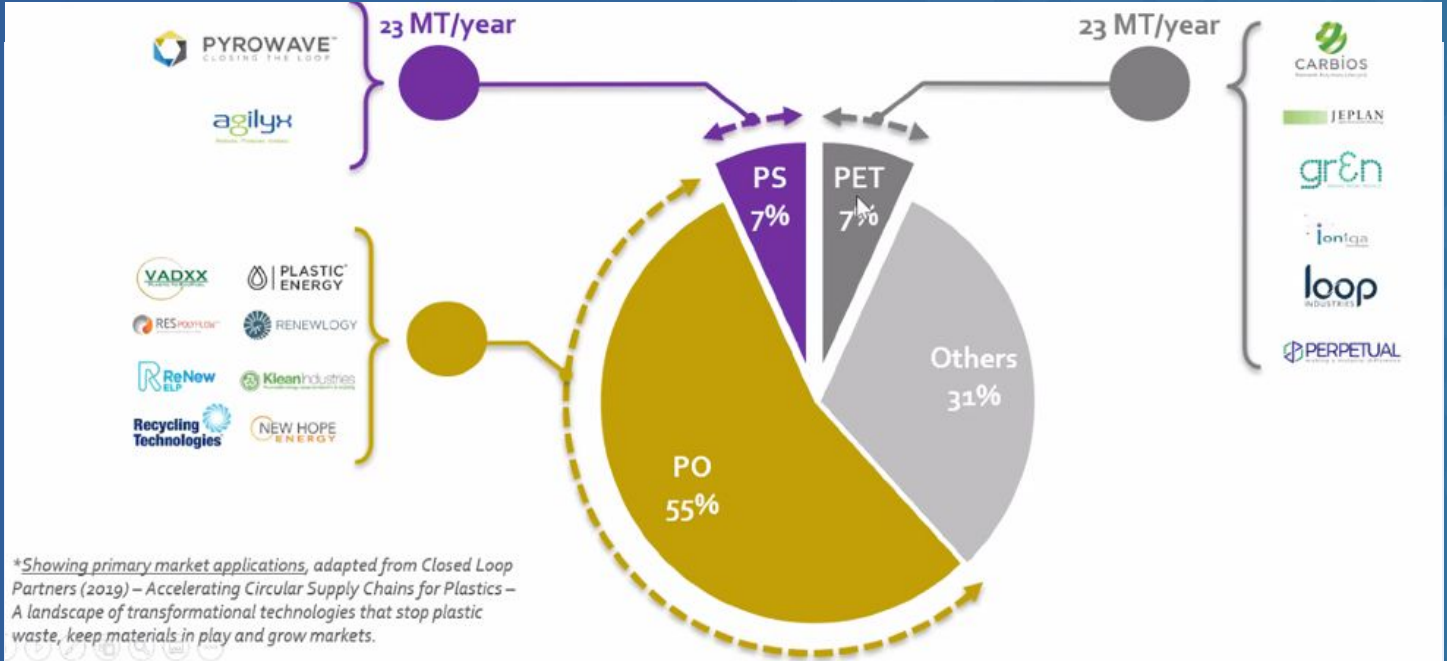
**If plastic sector keeps the current strategy, it will overshoot the carbon budget by four.**

## Recycling is not enough




## ‘Chemical recycling’ represents a range of technologies

- Chemical technology - Chemical depolymerisation & solvent-based purification
- Thermo-chemical technology - Pyrolysis & gasification




# ‘Chemical recycling’ primary market applications

# A cautious approach is needed

There is a **significant lack of knowledge about the overall life cycle impacts** of chemical recycling on the environment. There are indications, however, that chemical recycling **works only under very specific and narrow conditions** and that it **consumes energy, water and chemical resources** that **increase the pollution of water, air and land**

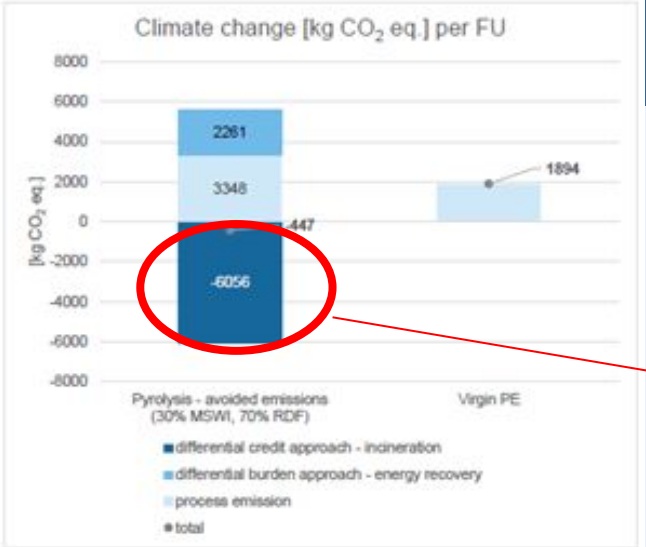
If chemical recycling is to become a more widely used technology, it will be important to **explore the environmental and climate implications and risks** as well as the financial costs in more detail

- European Environment Agency (EEA), 2021

https://www.eea.europa.eu/publications/plastics-the-circular-economy-and/


# Environmental impact

Currently, it is **impossible to make a true comparison and know the real impact of chemical recycling**, therefore there a strong need of standardised and transparent life cycle assessment (LCA).




*From LCA study conducted by Sphera Solutions for BASF*

# Understanding the climate impact

**Example: pyrolysis + PE**

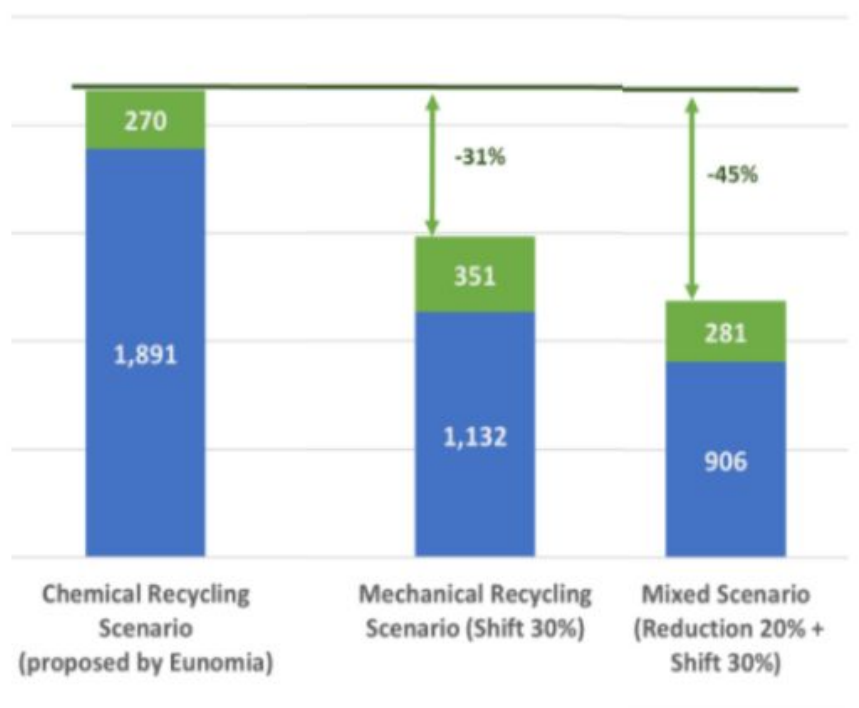
Only by giving "climate credits" from avoided incineration. If emissions from pyrolysis were transparently reported it would not come out favourably in relation to virgin plastic production.

**Energy intensive processes! Despite claims, pyrolysis cannot be self-sustained on energy while also producing plastic feedstock of reasonable yield**

# Climate impact of scenarios to manage plastic waste

Case scenario – plastic packaging

- Emissions from mechanical recycling are lower than those from chemical recycling by a factor of 9.
- Over half of the carbon is lost during the chemical recycling process (53%). For mechanical recycling, the loss amounts to 31%.



# Summary

- Chemical recycling as a role to play in the circular economy, but incentives should be given to higher part of the waste hierarchy
- Chemical recycling should only consider plastic-to-plastic practices, not plastic-to-fuel
- Plastic products should be truly designed for recycling

#ZeroWasteOurFuture

# Thank you

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