



# High quality methylal from non-recyclable plastic waste by an improved Catalytic Hydro-Gasification Plasma(CHGP) process

<http://www.life-ecomethylal.eu>

## Funded by



## Associated beneficiaries



AIMPLAS

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3. Life ECOMETHYLAL main objectives
4. Main results
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# Background

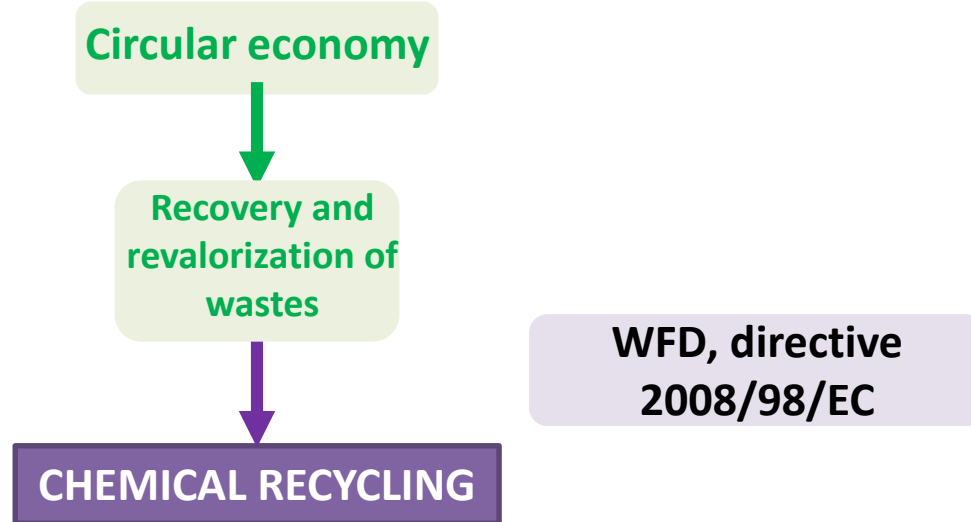


Circular economy

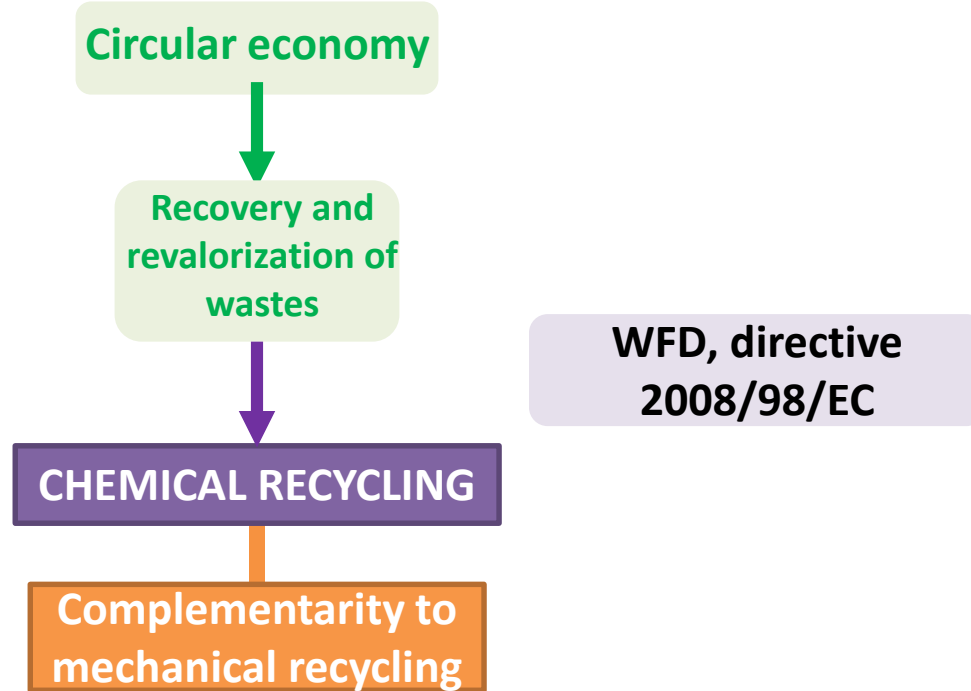


Recovery and  
revalorization of  
wastes

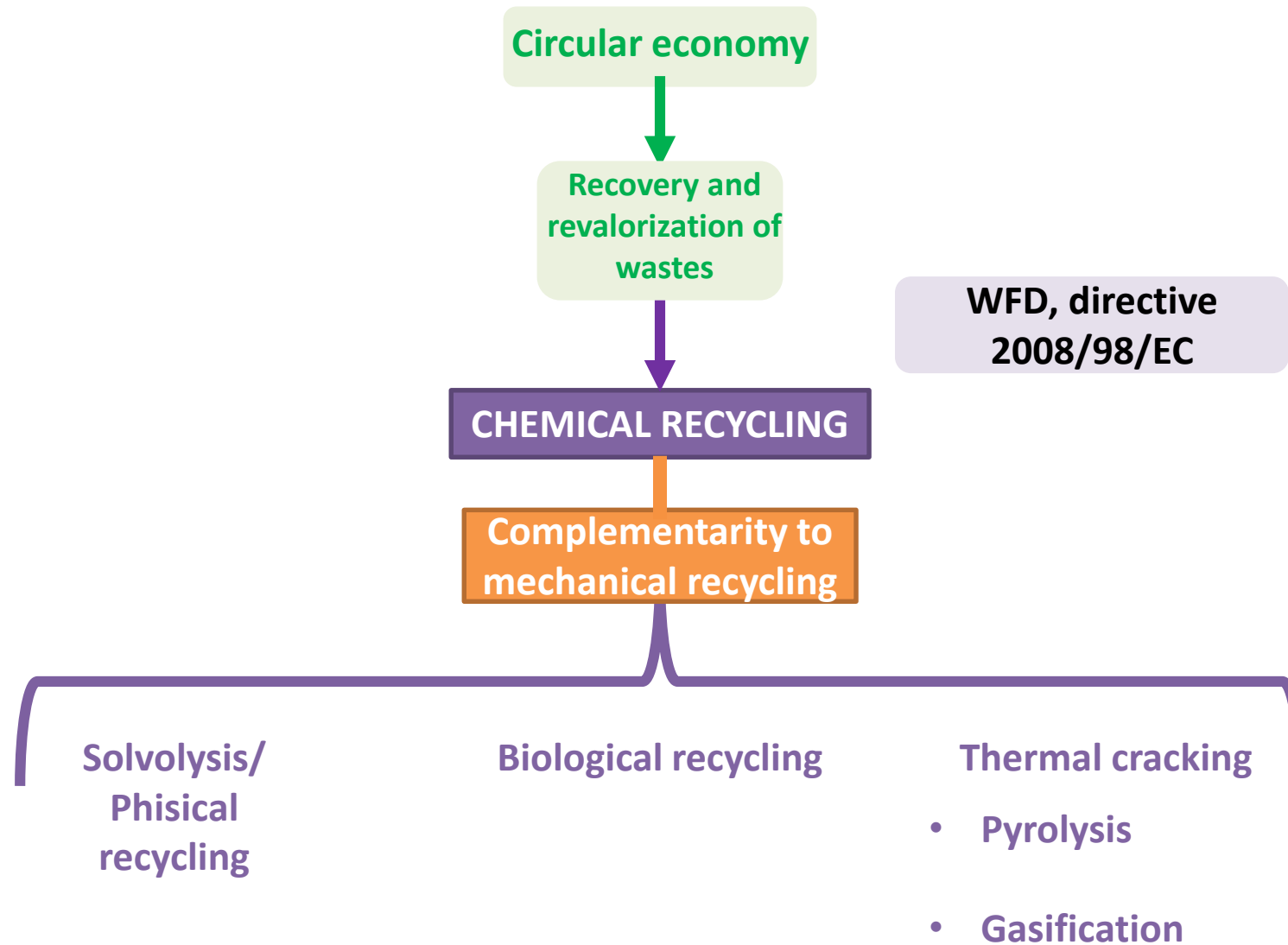
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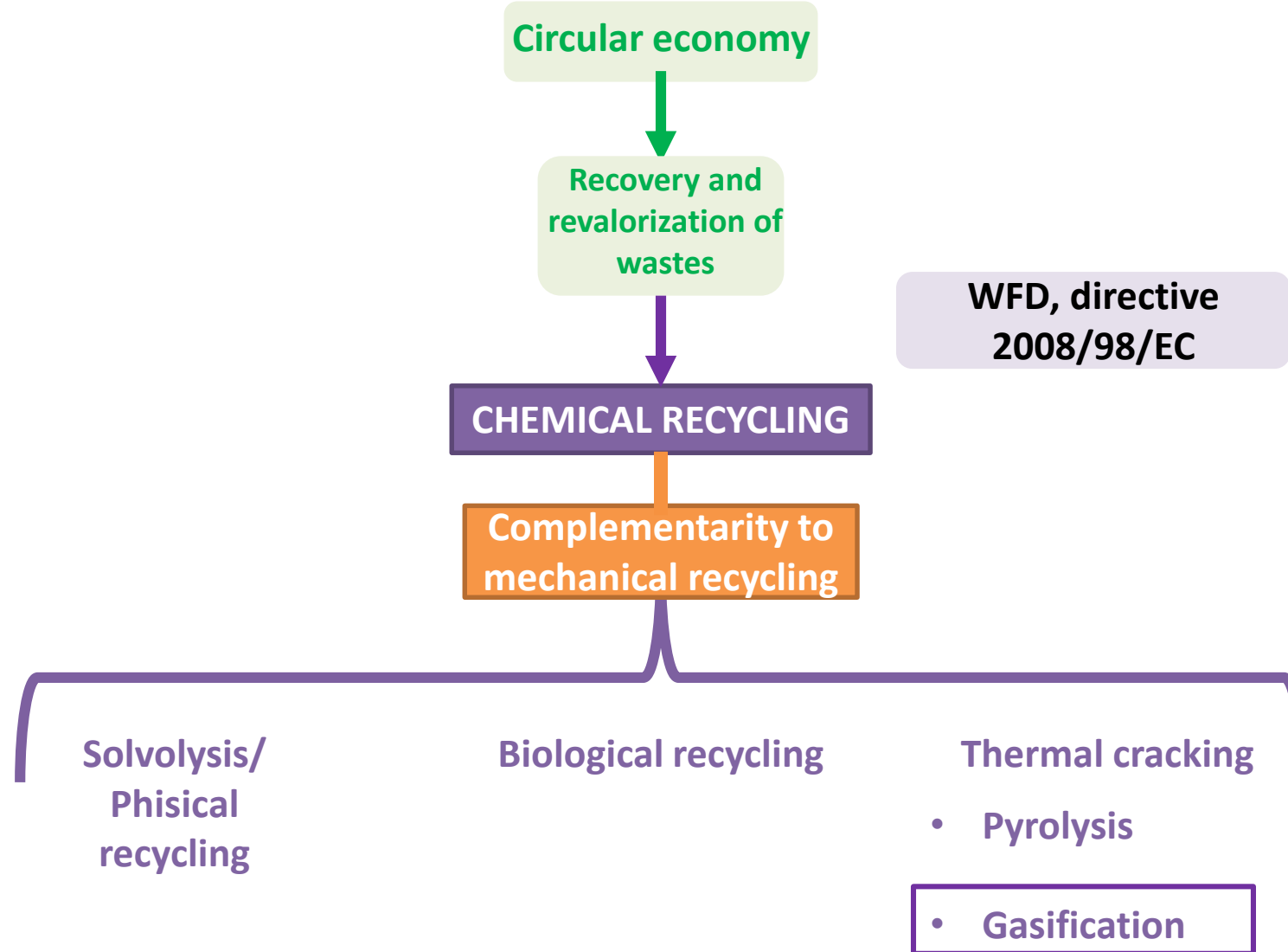
# Background



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# Background







## R&D PROJECTS



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*Life*  
ECO  
METHAL  
LAL

## R&D PROJECTS



### MAIN POINTS

- Non recyclable plastic fraction
- Technology: plasma catalytic hydrogasification
- Methylal

# Overview: non recyclable plastic fraction

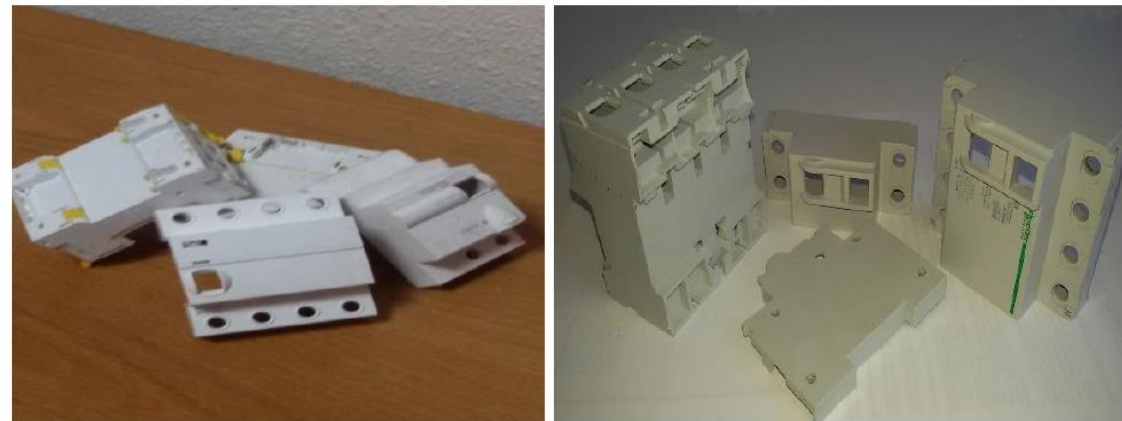


PACKAGING WASTE



AUTOMOTIVE WASTE

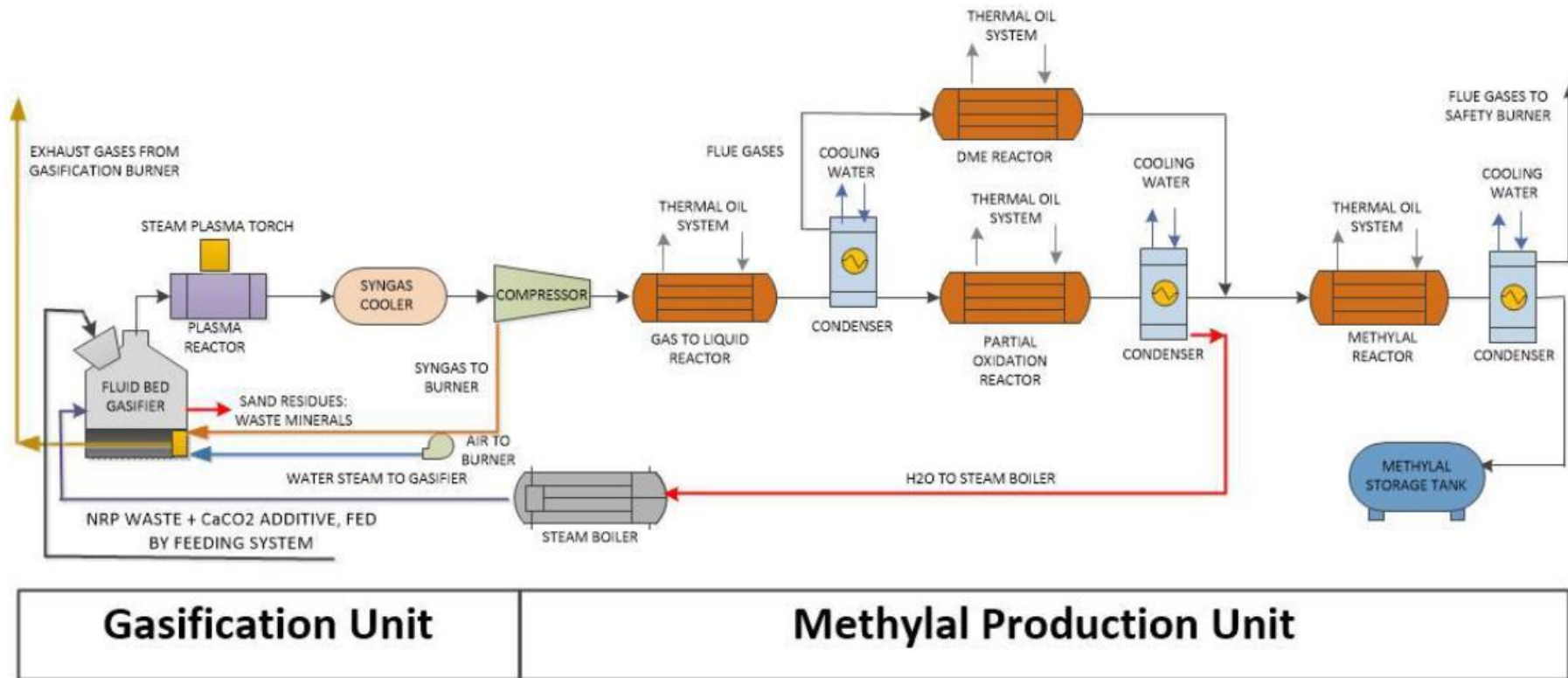
# Overview: non recyclable plastic fraction



ELECTRICITY/ELECTRONIC  
WASTE



# Overview: plasma catalytic hydrogasification



# Overview: plasma catalytic hydrogasification



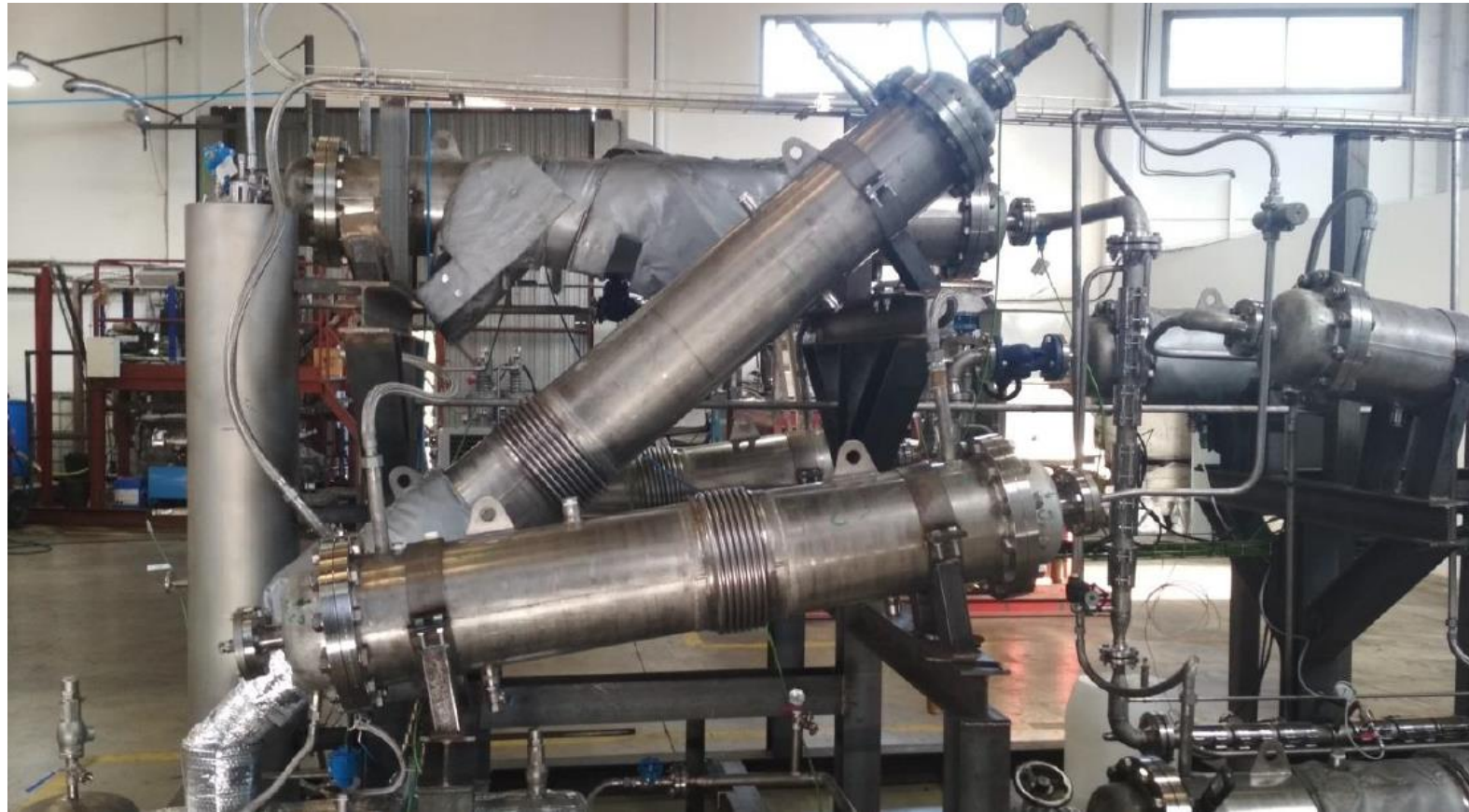
## GASIFICATION UNIT



# Overview: plasma catalytic hydrogasification



## METHYLAL REACTOR UNIT





# Overview: plasma catalytic hydrogasification



## CATALYST REACTOR





## Plasma Catalytic Hydrogasification

## Plasma Catalytic Hydrogasification

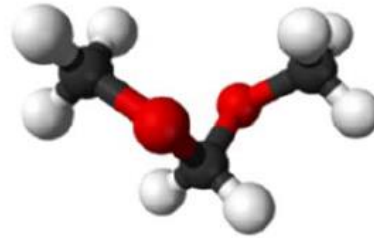


**ENERGY  
CHALLENGE**  
OPTIMIZE  
ENERGY  
EFFICIENCY?



**LEGISLATIVE CHALLENGE**  
TRACEABILITY/CALCULATION  
RECYCLED FRACTION IN  
PRODUCT?

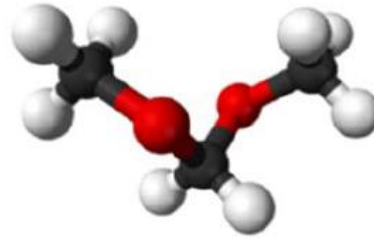
# Overview: Methylal



(Dimethoxymethane)

Condensation reaction in acid medium. Alternative: CHGP

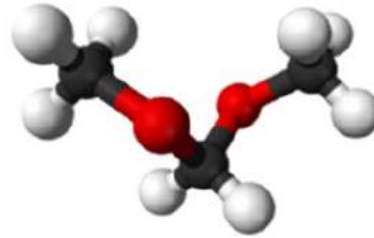
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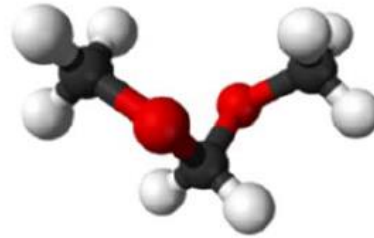
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## GENERALITIES

Biodegradable  
Amphilic  
Low viscosity

## APPLICATIONS

Organic synthesis  
Electrolytic  
solutions lithium  
batteries  
Good dissolving  
power  
Substitute for  
traditional fuels

# Objectives of the project



1. **Reduce the NRPW address to landfill** and a **new eco product** commercialized (by material recycling) which is a **more sustainable** alternative compared to the current one from fossil sources
2. **It contributes to the shift towards a resource-efficient, circular economy** and specifically, to the plastic waste recovery
3. Implement a **mature** and **patented solution** for **homogeneous biomass**
4. These plants can be installed inside/closed to the plastic treatment plants/recyclers companies to treat the non-mechanically recyclable fraction
5. The LIFE ECOMETHYLAL **replicability** to all EU **will contribute to reduce landfill waste**



# Main results



- Development a pilot plant with a compact and modular configuration which requires small space and low investment. It runs continuously, reducing energy consumption
- Ecomethylal plant is able to manage heterogeneous plastic waste resulting in low humidity and some pollutants
- **3.6 tonned of waste treated** in the project
- **36 % efficiency process** (kg methylal/kg plastic aste) which could be increased to 50 % by improving temperatura and pressure control at the industrial plant
- **>80 % purity of methylal**





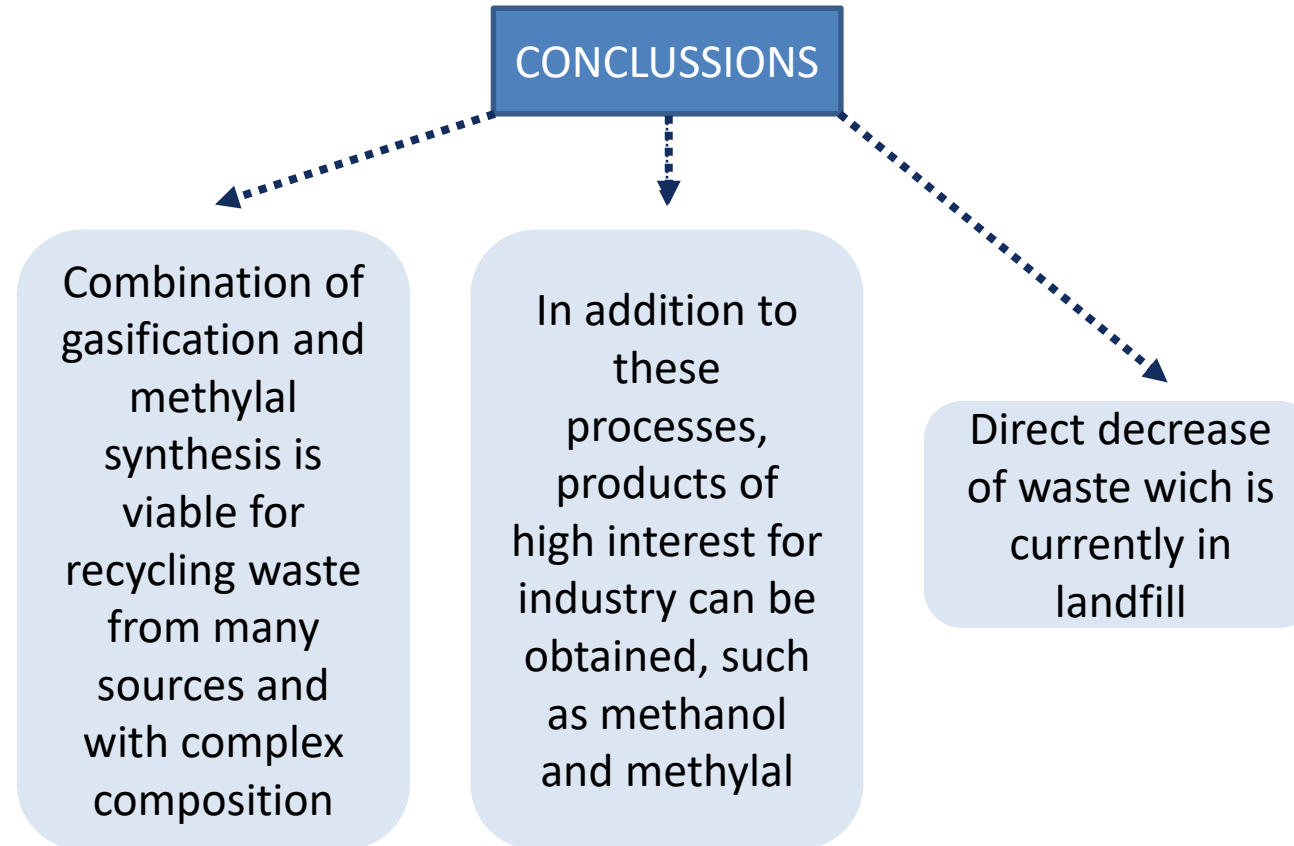
**ECONOMIC  
CHALLENGE:**

improve  
kg methylal/waste  
ratio?  
Variability of waste  
price?



- **Plant emissions** comply with the limits of current **European environmental** regulations
- Try to **collect and optimize residual heat** flows from the gasification unit and the exothermic reaction. It could reduce the total in 70 % reduction of electrical power in the synthesis unit compared to the pilot plant
- The **compact size** of the technology allows it to be implemented at the waste manager's facilities
- The modular nature of the technology, with an annual treatment capacity of a maximum of a **8000 tonnes/year** of plastic waste

# Conclusions





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Associated beneficiaries



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