

# CAT<sub>2</sub> CONVERTERS

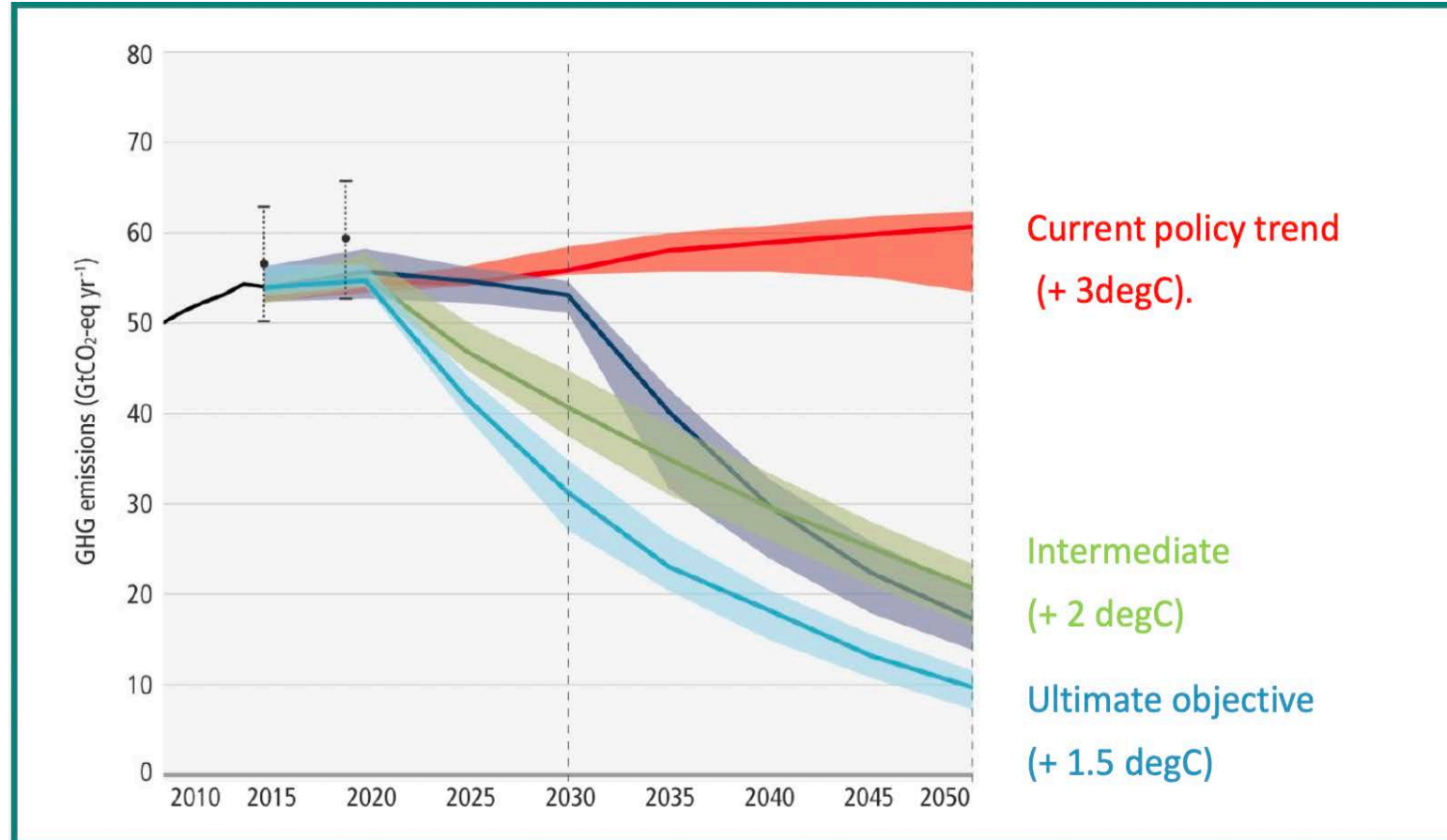


Creating added-value chemicals from bio-industrial CO<sub>2</sub> emissions

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## PROBLEM:

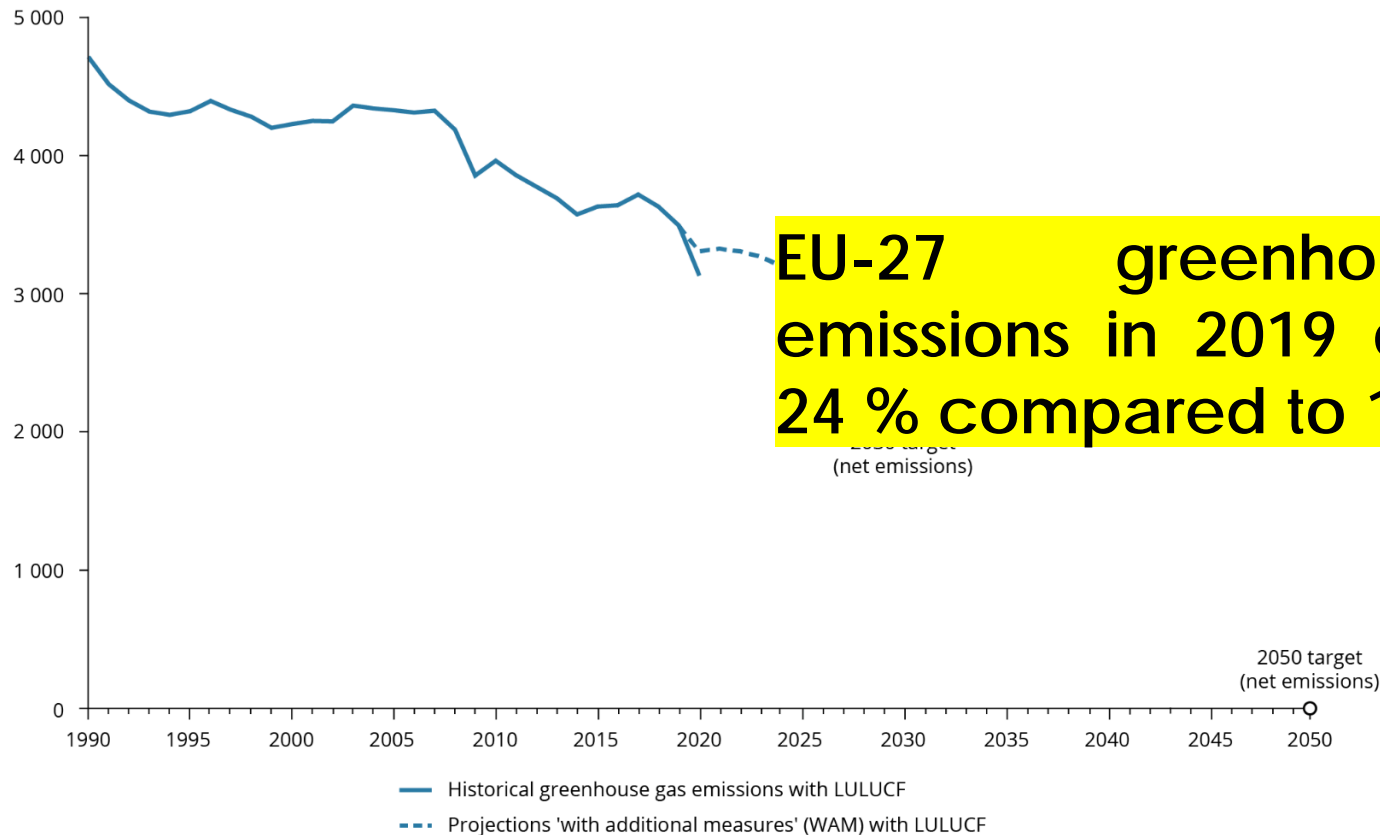
- Human-induced greenhouse gas (GHG) emissions have never been as high as they are today.
- Global warming should not exceed 1.5°C



## MEASURES:

### Greenhouse gas emissions targets, trends and projections in the EU, 1990-2050

Million tonnes of CO<sub>2</sub> equivalent (Mt CO<sub>2</sub>e)



Source: EEA, *Trends and Projections in Europe 2021*, European Environment Agency.

- Implementation of EU and national policies

in the use of

- Improvements in energy efficiency

- Structural changes in the EU economies.

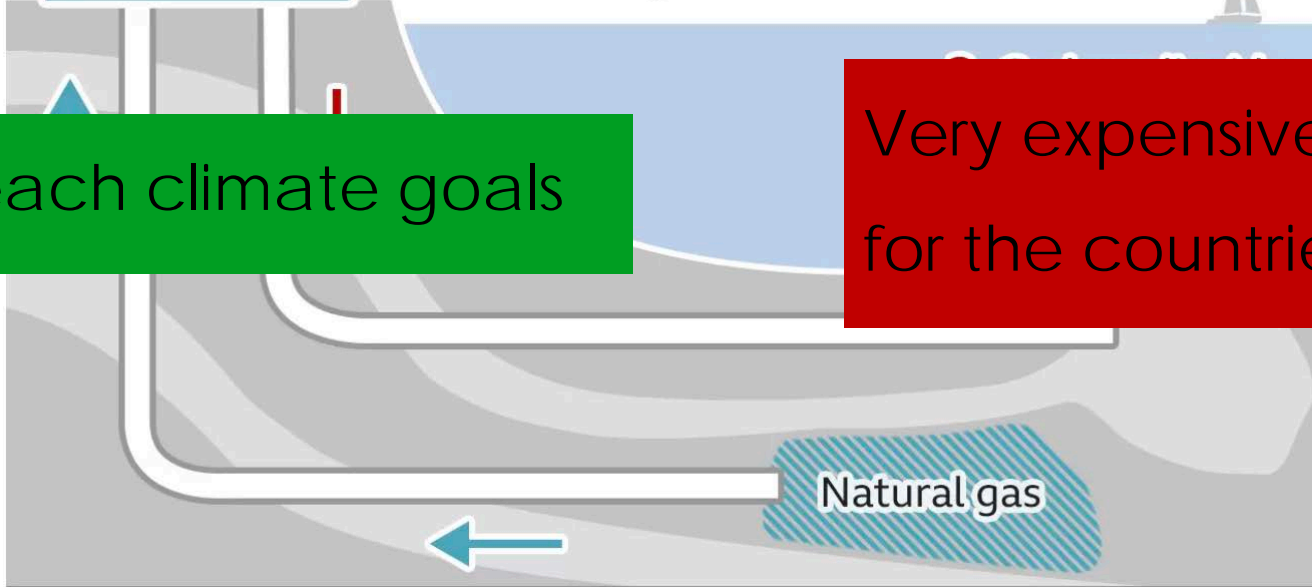


## CARBON CAPTURE AND STORAGE:

1. Natural gas burned at power station



2. Carbon dioxide separated from other gases



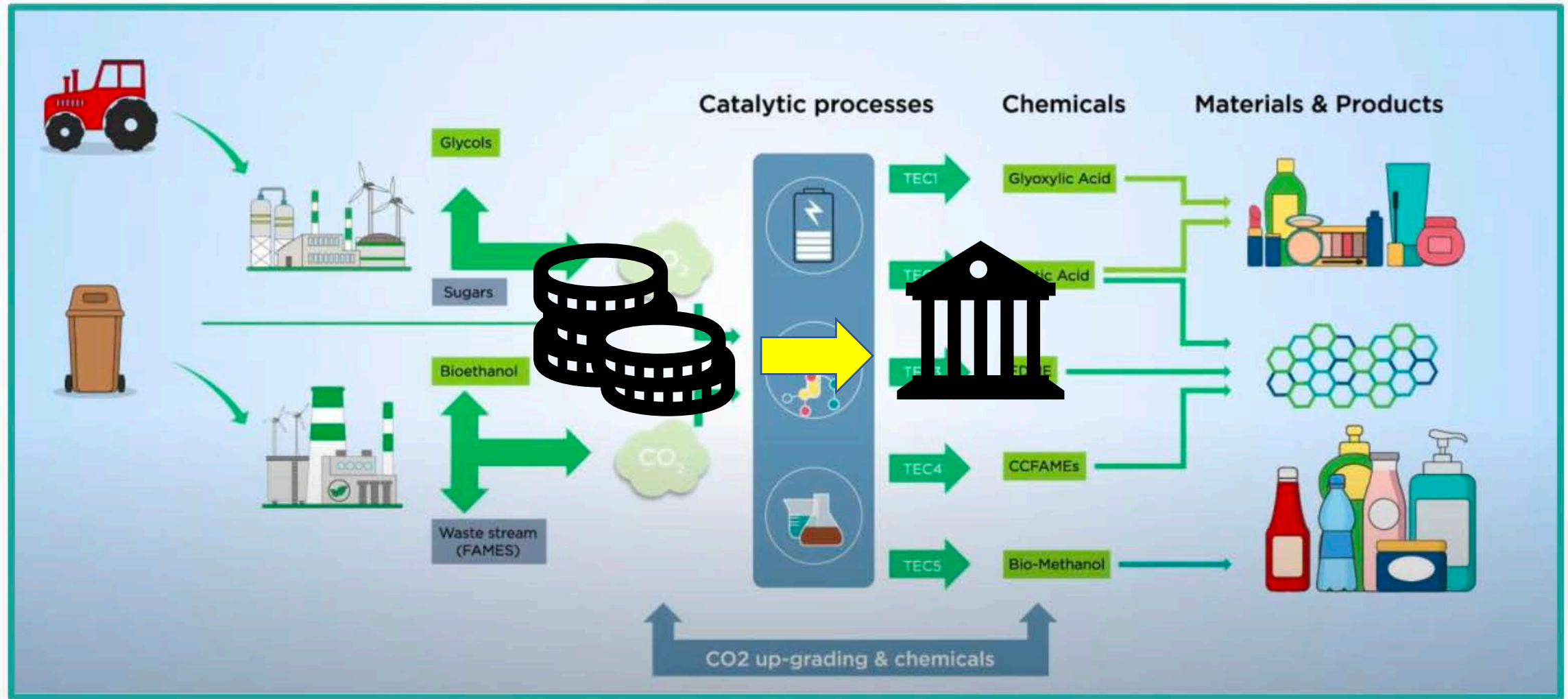
Fast option to reach climate goals

Very expensive and a burden for the countries using it

Source: BBC, *Carbon Capture: What it is and how does it fight climate change?* 2023



# CARBON CAPTURE AND UTILIZATION:



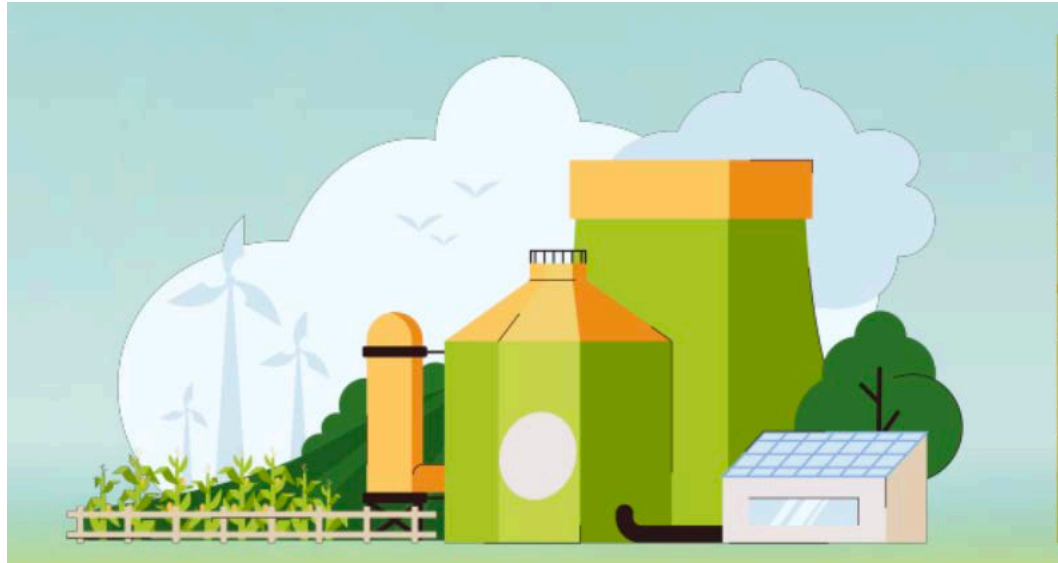
# PROJECT OBJECTIVES

- Reduce greenhouse gasses emissions based on three catalytic processes (electrochemical, enzymatic and thermochemical)
- Transform waste-CO<sub>2</sub> from two biobased industries into five added-value chemicals (glyoxylic acid, lactic acid, furan dicarboxylic methyl ester, cyclic carbonated fatty acid methyl esters, and bio-methanol), with application in the chemical, cosmetics, and plastic industries.



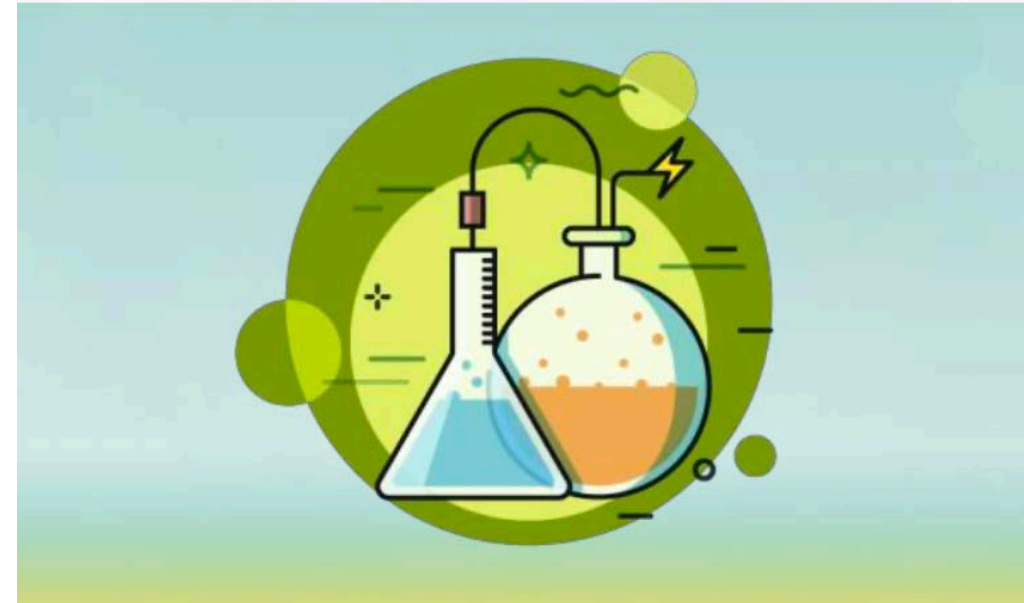
# YES BUT, WHAT IS A BIO-BASED INDUSTRY?

- Uses living organisms to produce various goods and services.
- This includes industries that produce food, beverages, chemicals, fuels, and other products.



# AND WHAT IS A CATALYTIC PROCESS?

- Is a chemical reaction that is facilitated or accelerated by a substance called catalyst, that makes a chemical reaction faster, more efficient, or more environmentally friendly





# DO I SEE THOSE CHEMICALS IN MY DAY TO DAY?



**Glycolic acid (GA):** pharmaceuticals, dyes, resins, and other chemicals.



**Furan dicarboxylic methyl ester (FDME):** polymers, resins, and other materials more sustainable compared to traditional petroleum-based products.



**Bio-methanol:** fuel, solvent or biofuels. Is a renewable alternative to petroleum-based methanol.



**Lactic acid (LA):** biodegradable plastics, flavoring agent and preservative in the food system. PH adjuster in cosmetic and personal care industry.



**Cyclic carbonated fatty acid methyl esters (CCFAMEs):** surfactants, lubricants and biodegradable plastics.



# IMPACTS

CATCO2NVERS



CATCO2NVERS will advance in setting up sound business models which involve all the actors across the proposed value chains and consider the different scenarios of the technology implementation while bringing down environmental impacts and production costs

1

## Environmental benefits

The reduction of greenhouse gas emissions and air quality protection

2

## Economic benefits

European industries can become more competitive and create new jobs in the bio-based sector, becoming also more resilient to the volatility of oil prices

3

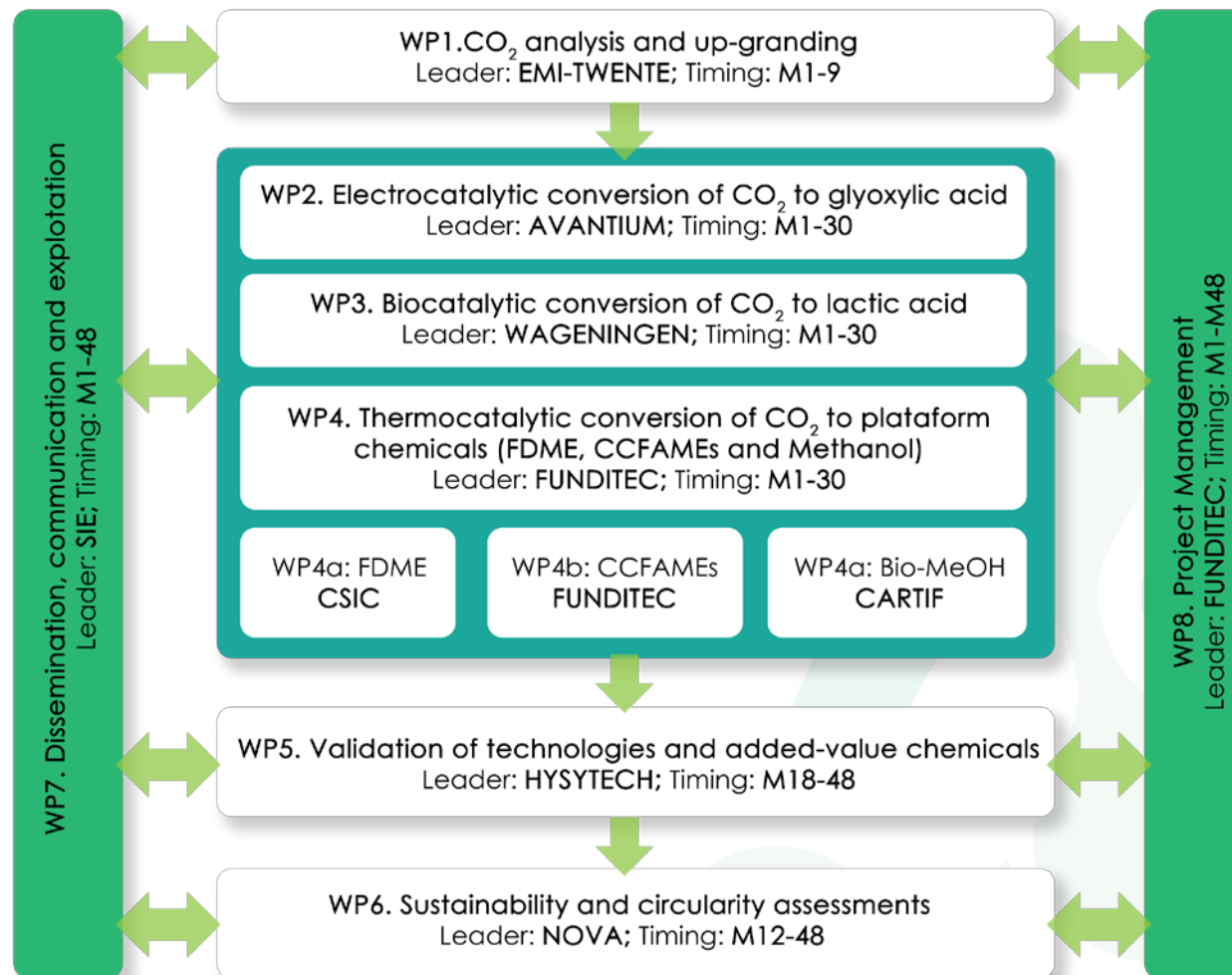
## Social benefits

New jobs opportunities in rural areas, reducing urban-rural migration



*This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 953073.*

# METHODOLOGY



# PROJECT PARTNERS



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