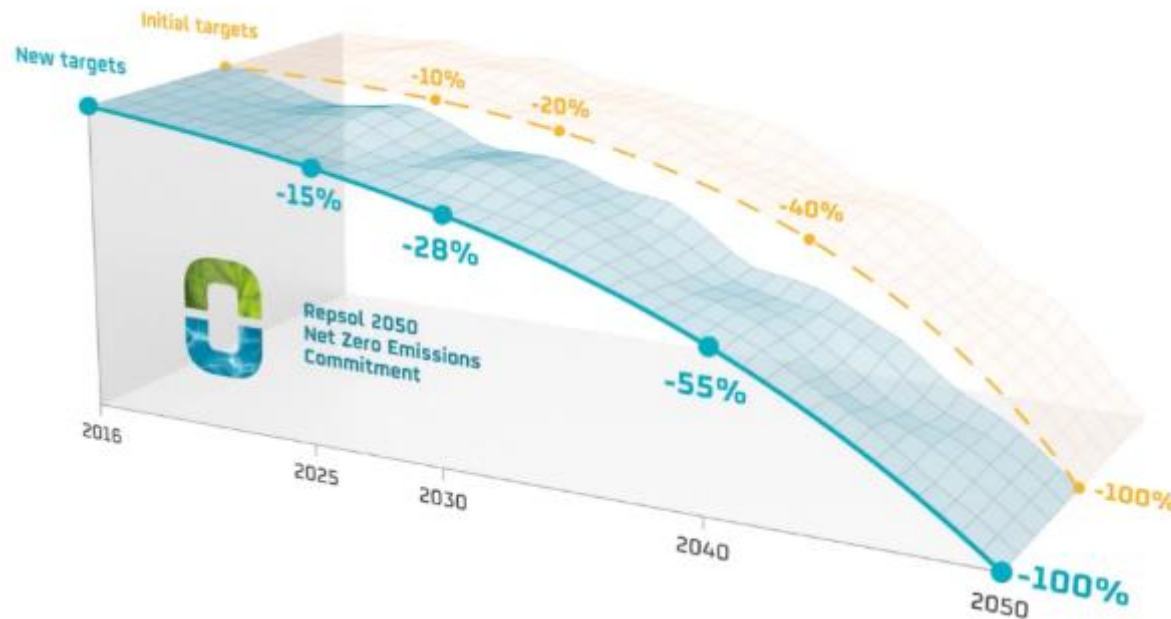


 V CICLO DE  
**ECONOMÍA CIRCULAR**  
EL SECTOR INDUSTRIAL HACIA LA CIRCULARIDAD

**Ecoplanta**  
David Pérez Gonzalo

## Repsol. Net Zero Emissions Target

Repsol is a global multi-energy company with a vocation to lead the energy transition, with the goal of being **net zero emissions by 2050**.



It is present throughout the energy value chain, employs 24,000 people, distributes its products in nearly 100 countries and has 24 million customers.

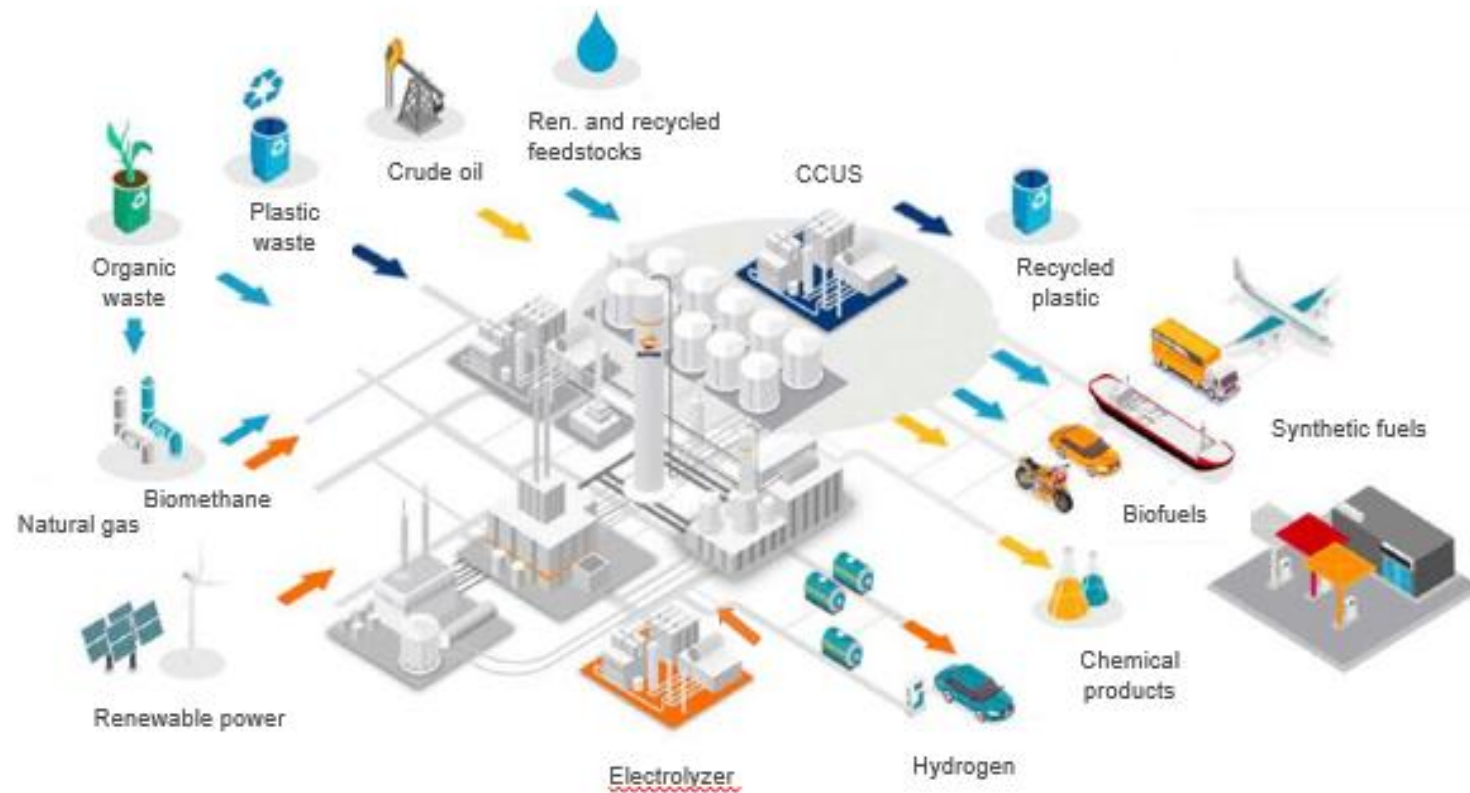
To achieve net zero emissions by 2050, Repsol is committed to an **inclusive model** that integrates all technologies for **decarbonization**, based on improving energy efficiency, increasing its **renewable electricity** generation capacity, producing fuels with a low carbon footprint, developing **new solutions** for customers, developing the circular economy and promoting **cutting-edge projects** to reduce the industry's carbon footprint.

## Repsol. Strategic Targets

Raw materials  
Scope 3

&

Energy  
Scope 1 - 2



 **2,4 GWeq**

Increased renewable H2  
ambition by 2030

 **2,3 TWh**

Increased biomethane target  
by 2030

 **2,7 Mton**

Renewable fuels by 2030

 **200 kta**

Recycled polyolefins  
by 2030



Committed to Net Zero  
Emissions

# Repsol and Enerkem Fit - The leaders in sustainability



Pioneer in molecular recycling

## What did Enerkem seek in Repsol?

### Repsol can speed up Enerkem's project rollout in Iberia

- Repsol is the main H2 producer and Iberia has competitive renewable energy for green H2
- Well positioned in the waste ecosystem
- Industrial asset base and operation
- Offtake integration → leader in trading and marketing
- Experience licensing proprietary Technology to third parties
- Strong track-record of world-scale projects



Leading the energy transition

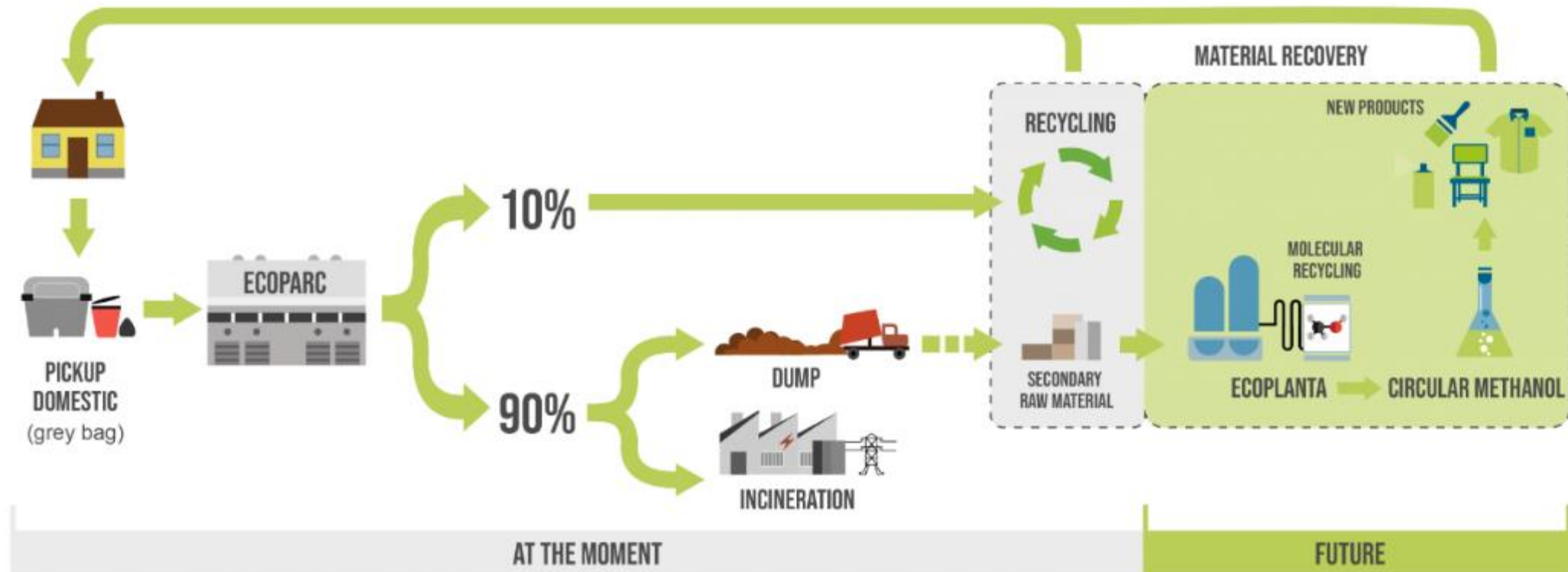
## What did Repsol seek in Enerkem?

### Enerkem, a good partner to meet Repsol decarbonization goals

- Preferential access to advantageous technology
- Better access to new projects in Iberia
- Early investment in a technology company with value upside potential
- Opportunity to develop competitive advantages in a new technology
- Technologist of choice for joint developments

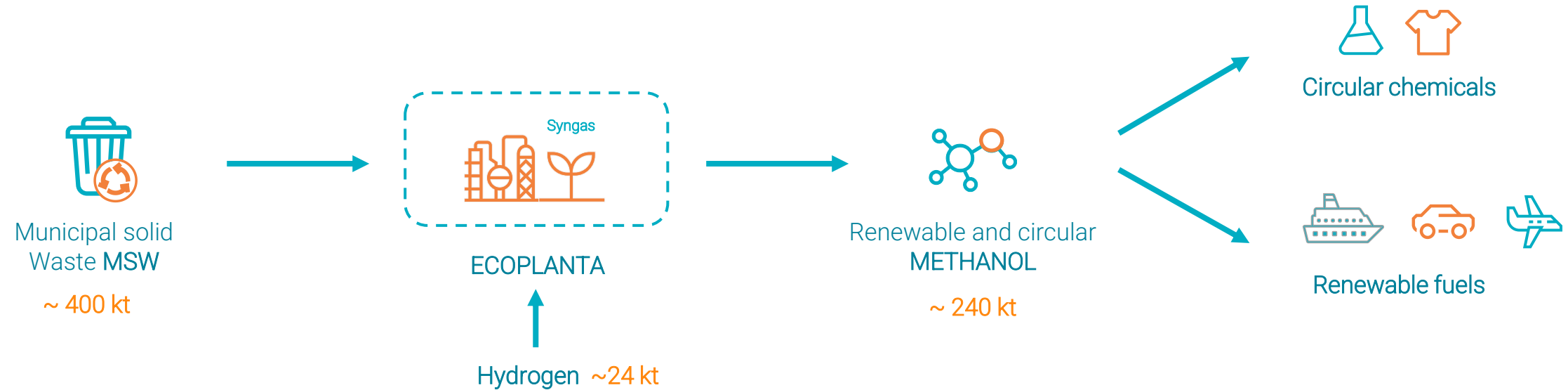


## Ecoplanta - FOAK project that contributes to the development of the circular economy, decarbonization and more sustainable future



- Located in El Morell, Tarragona– will be the first plant in Spain to produce **circular** and **bio methanol** from treated **municipal waste**, mainly from the surrounding **Eco-parks**.

## Ecoplanta - Project summary



- Startup in 2028
- 3.4 Mt CO<sub>2</sub>eq of greenhouse gas (GHG) emissions reductions over the first ten years of operation
- Recycling over 70% of the carbon present in the residual waste
- Located in Tarragona, Spain

# Ecoplanta - Highly innovative waste-to-methanol process



## Waste to landfill reduction

Ecoplanta will process the **non recyclable waste** from Ecoparks that currently end up in landfills.

The project is aligned with the EU and national directives in terms of reduction of waste to landfill and increasing recycling rates. The EU Waste Directive (2008/98/CE amended by 2018/581) sets **ambitious goals**:

	2030	2035
% waste to landfill reduction	20 %	10 %
% material recycling	60 %	65 %

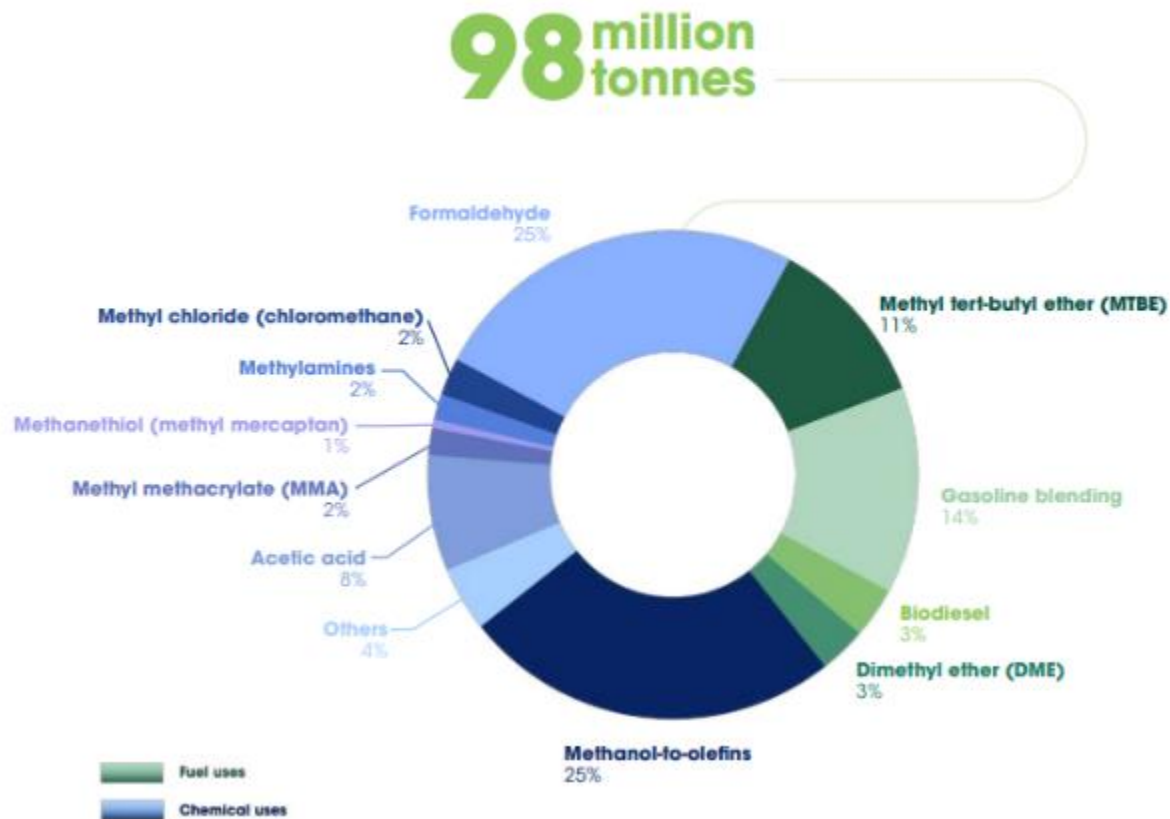


## The product

The process will produce around 240,000 tonnes of **renewable/circular methanol**, that can be used for:

- Production of **circular chemical products**: material recovery to manufacture chemical products (paints, resins...) and circular plastics (through the production of circular polyolefins)
- **Advanced biofuels**: according to the EU REDIII directive, the biomethanol produced will be considered an advanced biofuel used initially for road transport. Additionally, methanol can be used to **decarbonize "hard-to-abate" sectors** such as **maritime transport** and **aviation** with further processing.

## Methanol uses



- It is expected a high increase in the methanol demand to be used as shipping fuel
- Latest news suggests that methanol is one of the preferred option in the short-medium term with a foreseeable shift to green.
- Green methanol appears to be the frontrunner for **decarbonization of hard to abate sector like shipping or aviation.**



## Sustainability (I)



A pioneering project in Europe that contributes to the development of the circular economy, decarbonization and a more sustainable future.

### Industrial transformation – sustainable value proposal

Ecoplanta integrates the highest environmental standards in process and design, taking a first step towards a sustainable industry in the Tarragona area.

### Circular impact in methanol consumers' industries

Circular methanol, a building block for numerous industries, can become a lever to promote circularity within other sectors.



### GHG emissions reduction (IF methodology)

Ecoplanta will achieve 3.4 Mt CO<sub>2</sub>eq of greenhouse gas (GHG) emissions reductions over the first ten years of operation. It is calculated with the following formula:

$$\text{GHG emissions avoidance} = \text{GHG emissions from the reference scenario} - \text{GHG emissions from the project scenario}$$

Where:

- GHG emissions from the reference scenario are the GHG emissions from non-biogenic waste incineration
- GHG emissions from the project scenario are the GHG emissions associated to Ecoplanta.

## Sustainability (II)

### GHG emissions calculation. Biomethanol

- ISCC GHG Emissions Calculation Methodology based on Directive 2018/2001
- To be considered as a biofuel a minimum reduction of 65% must be achieved (reference fossil fuel: 94 g CO<sub>2</sub>eq/MJ)
- It was verified by Control Union (ISCC accredited company):
- An adequate calculation of process and transport emissions is considered, thus covering the scope of cradle-to-gate emissions.
- It is considered that the formula, the data and the results of the calculation of emissions obtained are correct.
- It was verified that it is obtained a calculation of savings in biomethanol emissions of > 65% (minimum required by the European Directive 2018/2001 (RED II)).



## Municipal Solid waste generation has become a major policy and environmental priority

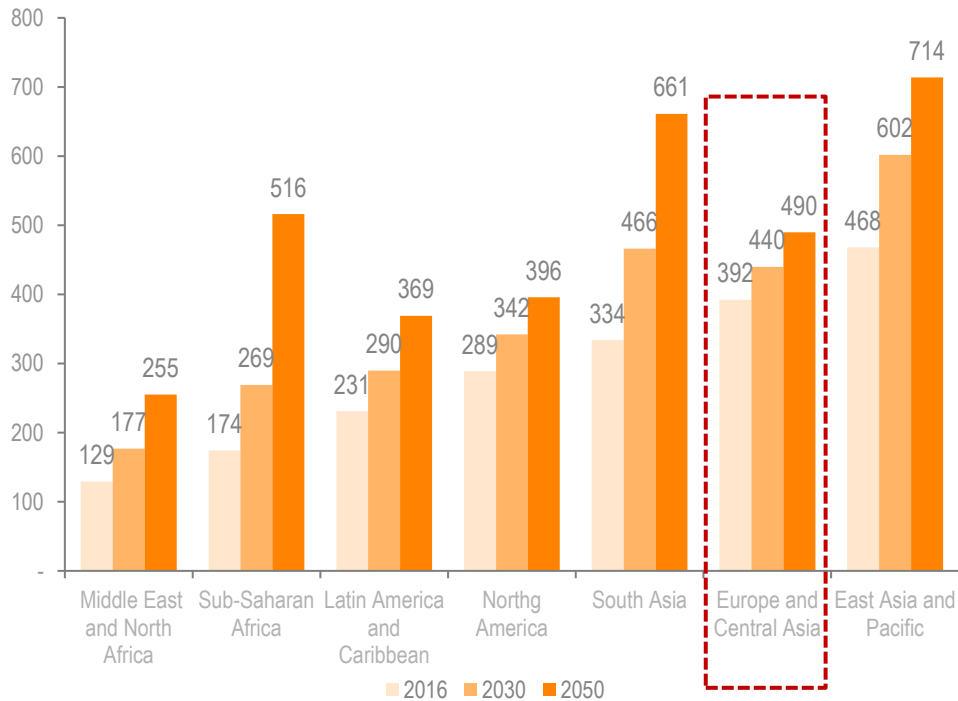
Every year, **~2 billion tonnes** of waste are dumped all over the planet and end up in landfill sites or scattered across the ocean. This amount is expected to increase to 3.4 billion tons by 2050 (70% increase from current levels).

Trends in MSW generation are directly linked to urbanization and economic development. As **countries urbanize and economic wealth increases**, consumption of goods and services increases which **results in a corresponding increase in the amount of waste generated**.

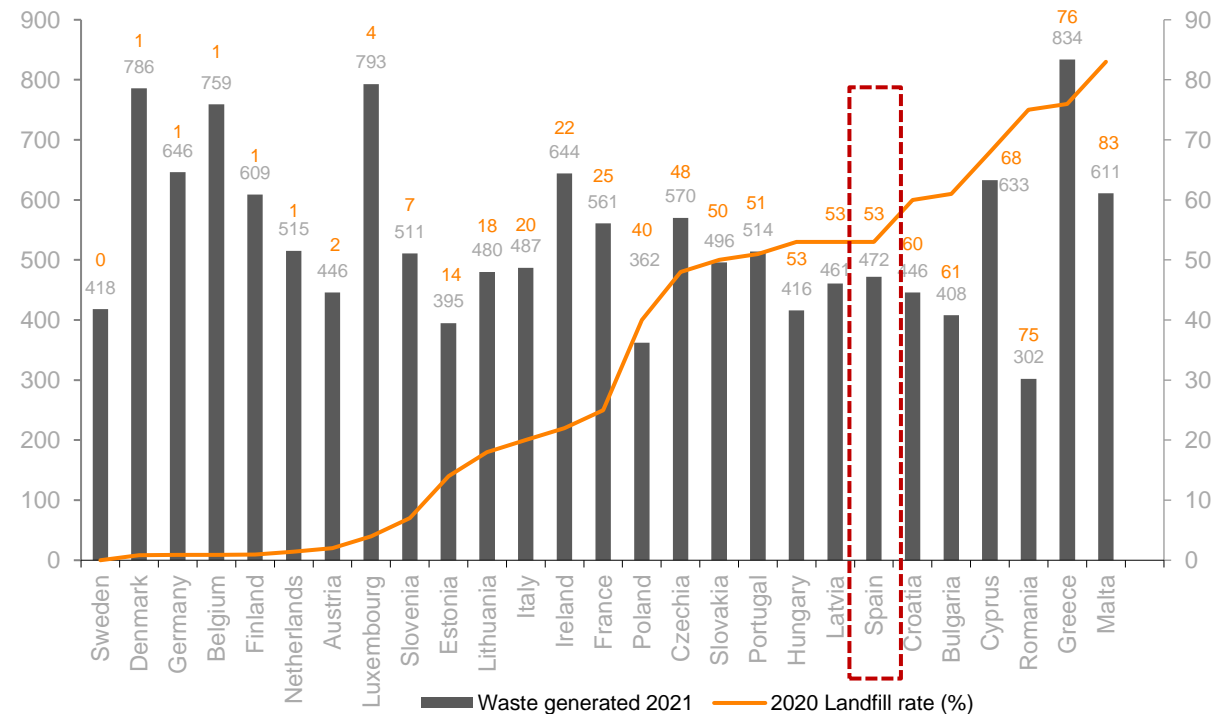
Addressing municipal solid waste has become a major policy and environmental priority.

# Municipal Solid waste generation has become a major policy and environmental priority

**Municipal Waste Generation Evolution per Region from 2016 to 2050 (mt/y)**



**Municipal Waste Generation (kg/capita) and Landfill rate (%) from EU countries**



# Gasification Technology Main Features

## 1. Flexibility

High flexibility to process heterogenous feedstocks (e.g. MSW low purity requirements and contaminants)

## 2. Versatility

Syngas production from waste has a large potential to decarbonize industrial processes as well as transport and chemical applications due its flexibility.

## 3. Efficiency

Key in the hybridization pathway as the most efficient way to produce E-fuels, and synergies with renewable H2 for chemicals production

## 4. Maturity

Higher maturity and utilization of the technology for greater short-term value capture

## 5. Scalability

Number of gasification lines

## 6. Sustainability

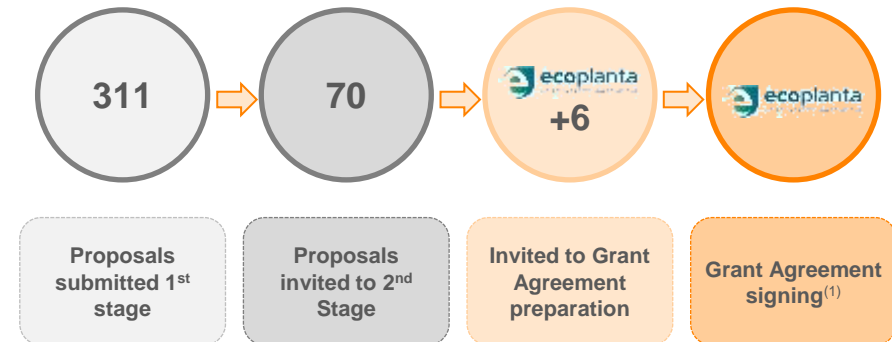
- EU Green Deal and Fitfor55 goals.
- Transport → (advanced bios)
  - Chemicals → (circularity/bios)

# Ecoplanta was 1 of the 7 projects awarded with the Innovation Fund grant amongst more than 300 applicants

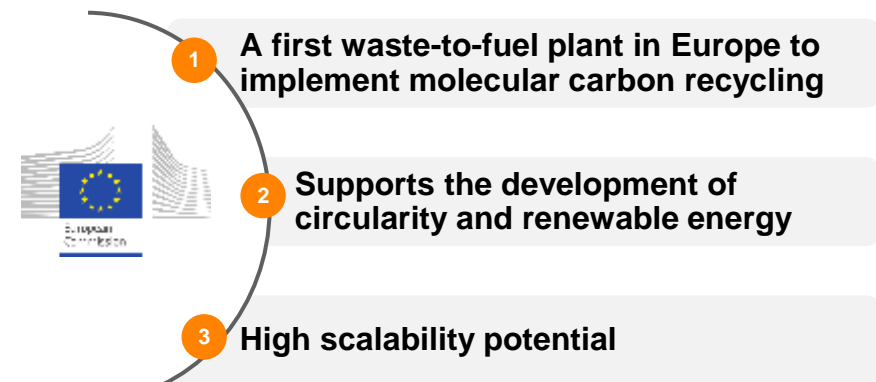
## Innovation Fund overview

- Ecoplanta was **one of the seven awarded projects** from the over 310 large-scale projects submitted in the European Innovation Fund Program in November 2021. In March 2022, Ecoplanta signed the **grant agreement** with the European Commission
  - Ecoplanta was the only large-scale project awarded in Spain
  - It offers a waste treatment solution unique in the EU
- There are currently no other plants in Europe using reject material from waste treatment plants to produce sustainable chemicals and biofuels
- The EU deemed the project innovative and Enerkem's technology sufficiently mature to be developed at a commercial scale

## Selection Process



## Criteria



# THANK YOU

[www.ecoplanta.net](http://www.ecoplanta.net)

