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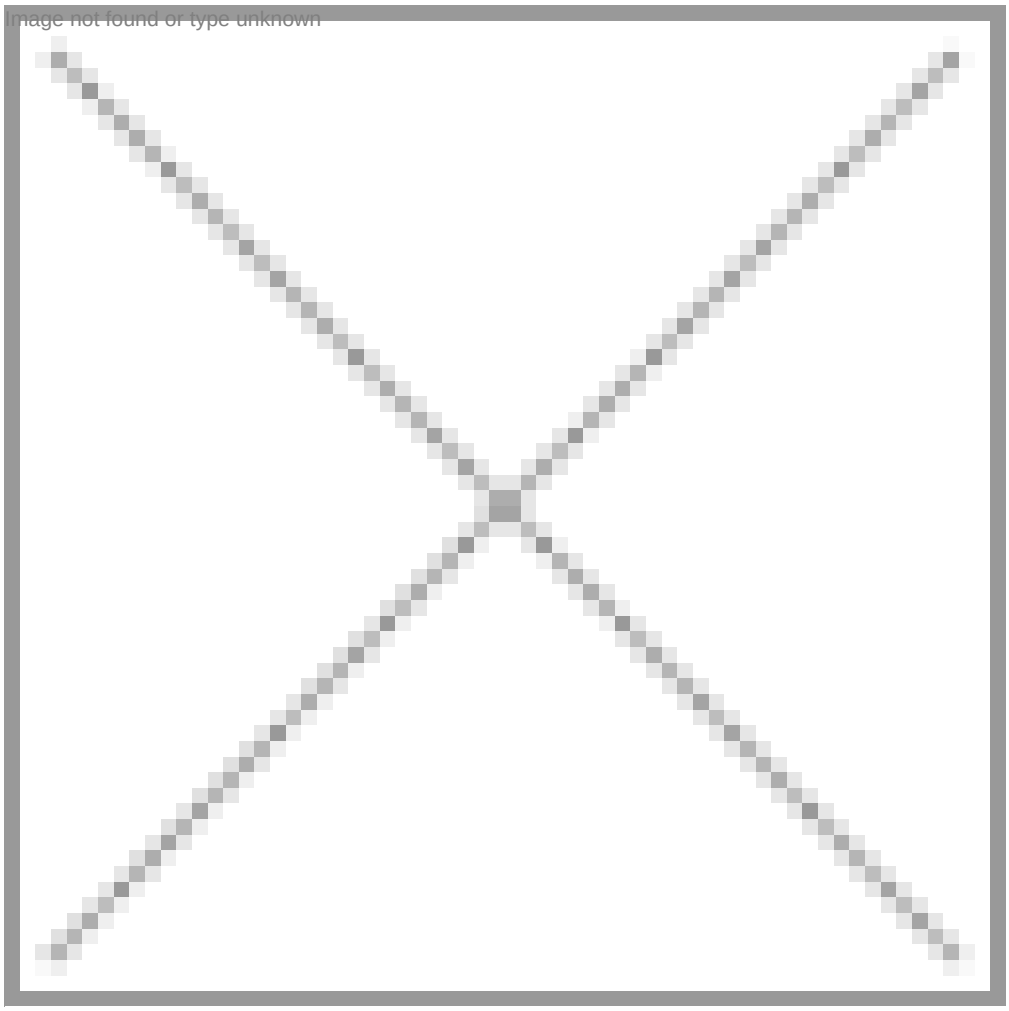

Circularity: Turning a Climate Issue into a Climate Solution

Context

Eighty-seven per cent of Europeans worry about the plastic environmental impact, and with good reason. Plastic's versatility and low cost have made it widespread, but according to the **EEA (European Environment Agency),** only an estimated 9% of the plastic ever produced has been recycled and 12% has been incinerated. The remaining seven billion tonnes of plastic waste pollute land, oceans, and habitats, causing severe climate, health, and financial issues.

Plastics2Olefins, a Processes4Planet Project

Plastic pollution is a major global environmental issue. The European Union aims to tackle it by redesigning how plastic products are created, used, and recycled. This will be achieved through ambitious policies like the **EU Plastics Strategy** and innovative projects. The Horizon Europe project Plastics2Olefins (**Recycling plastic waste into high-value materials- Closing the Loop**) is one of them. The project is funded under a Processes4Planet call and kicked off on 1 June 2022, under the coordination of the A.SPIRE member **REPSOL**.

The Aim

According to the **project's website**, in 2018, global plastic production reached 359 million metric tons, with Europe contributing 17%. The EU generated 29.1 million tons of plastic waste, of which only one-third was recycled. While recycling sorted and pure plastic is a relatively effective process, unsorted waste is often landfilled or incinerated, emitting greenhouse gases.

Hence, the starting point of the Plastic2Olefins project is the increased need for technologies to recycle unsorted plastic, creating a circular model. The identified promising technology is **pyrolysis** (the chemical decomposition of organic materials through heat), a process through which unsorted plastic waste can be transformed into circular olefins (a chemical compound of hydrogen and carbon).

Approach and Potential Impact

Up to 80% Anticipated GHG Emission Reduction

The project aims to design, build, and run a demonstration plant for recycling unsorted plastic waste at one of REPSOL's petrochemical industrial sites (in Spain). Unlike the traditional approach, Plastics2Olefins uses high-temperature pyrolysis. The innovation is currently being tested at a pilot plant with a capacity of 10kg/h. At the end of the project, a demonstration plant with a capacity of 1 tonne/hour is expected to be set (**source**).

According to the project coordinator, Ms Rebeca Yuste of Repsol, the estimated potential impact project is reducing the lifecycle GHG emissions by 70-80% compared to incineration and existing

plastics recycling processes. Plastics2Olefins also endeavours to set a pathway for the commercialisation of renewable plastic feedstock replacing fossil fuels.

For manufacturers in the plastic value chain, Plastics2Olefins technology could present an opportunity to create a perfectly circular model, as the carbon atoms in the plastic waste could be recycled into olefins and back into plastic again (**source**).

The Success Story

The Coordinator Angle

The technology will be licensed and will allow the industry to produce circular olefins with an important footprint reduction, maximising the yield of olefin from plastic wastes compared to conventional pyrolysis. For Ms Rebeca Yuste, the high replicability of the solution developed by Plastics2Olefins is a valuable contribution to a greener society.

A.SPIRE considers Plastics2Olefins a success story as it will address two major environmental concerns. It is a comprehensive Horizon Europe project taking one environmental pain point (plastic waste) and turning it into a valuable feedstock through a digitalised pilot plant that runs 100% on renewable energy in a low-carbon footprint process. An all-encompassing initiative tackling the pressing issue of plastic waste that creates a model of circular economy and climate neutrality. For a prosperous and healthier society.

Check out **this document** for more information about the June Success Story and pictures of the demonstrators.

Visit the **Plastics2Olefins website** for more information.

For more information about A.SPIRE, the Processes4Planet Partnership, and the Success Stories campaign contact **the team**.