

Flexible Bioenergy and new economic models. Renewable bio-hydrogen production technologies from Lignocellulosic Waste and Sewage Sludge co-fermentation

LIFE REPTES PROJECT

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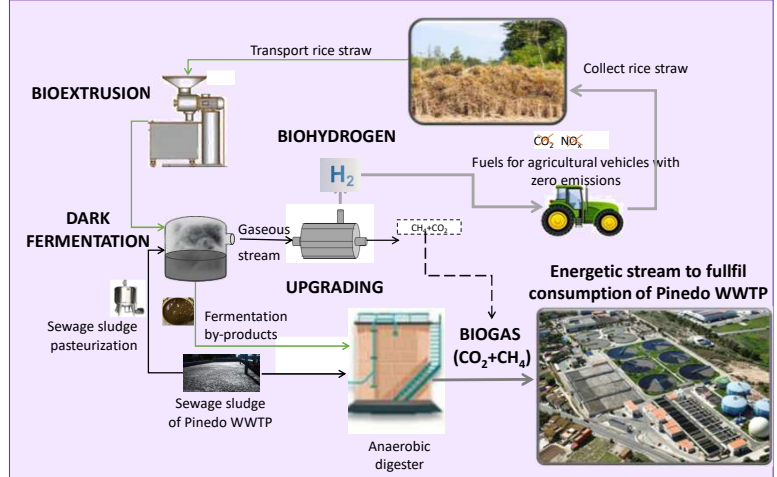
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INTRODUCTION

- Huge amounts of **rice straw** are burned annually in the rice fields situated close to Albufera Natural Park (Spain), meaning massive emissions of **greenhouse gases** (GHGs) and particulate matter that affects the quality of life of surrounding populations with an important environmental impact.
- In Albufera, **more than 88,000 tonnes** of straw are produced annually in the **14,700-hectare** cultivated. The proper management of this biowaste shows an important environmental challenge. Currently, burning or burying are the most used techniques. Both of them show important environmental problems.
- This situation is repeated yearly in other Regions of Europe that are main producers of lignocellulosic crops like rice or wheat.
- Consequently, it is urgent to find economic and environmental solutions to manage this kind of biowaste.

VALUE CHAIN OF THE TECHNOLOGY DEVELOPED WITHIN REPTES PROJECT



OBJECTIVES

Finding alternatives to burning rice straw in the surroundings of Albufera Natural Park (Valencia), through the development and demonstration of a new circular model that will produce **green biofuels (biohydrogen & biogas)** with rice straw and the sewage sludge generated in Wastewater Treatment Plant (WWTP) of Pinedo (Valencia).

Technological objectives: To design, construct and implement a demonstration plant at Pinedo WWTP including 3 different modules:

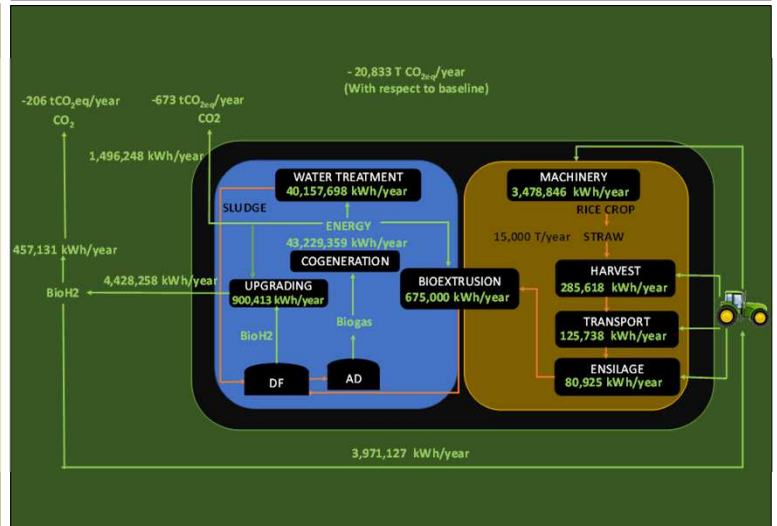
- **Pre-treatment** module for rice straw by bioextrusion of previously ensiled rice straw.
- **Dark fermentation** reactor module of 20 m³, able to treat 4 m³/d of bioextruded rice straw mixed with sewage sludge.
- **Pilot anaerobic digester** module (2 m³) for the demonstration of the enhancement of the biogas generation by using the fermented stream as a co-substrate. It is expected to reach an increase of the biogas production of at least 35 %.

Environmental objectives: To demonstrate the reduction on the greenhouse emission, in terms of CO_{2-eq}, to the environment during the project implementation.

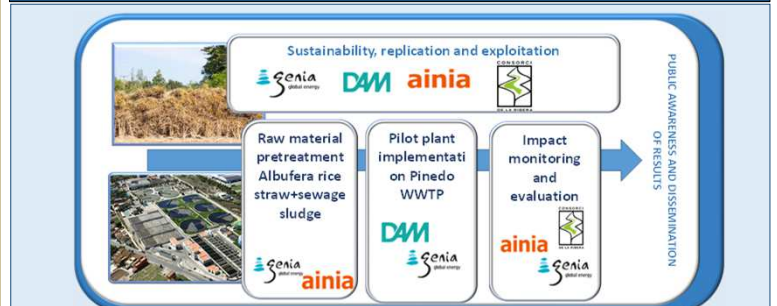
Societal objectives: To provide local authorities (councils and regional water authorities) with new tools for reaching a climate neutral economy by increasing the generation and use of renewable energy and improving the energy efficiency.

Business objectives: To demonstrate self-sustainability of the LIFE REPTES business model compared with the baseline situation.

ENVIRONMENTAL IMPACT OF THE REPTES SOLUTION



CONSORTIUM



Renewable bio-hydrogen production technologies from lignocellulosic Waste and sewage sludge co-fermentation (REPTES PROJECT)

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