



With the contribution of the LIFE
Programme of the European Union
LIFE20 CCM/GR/001642

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CO₂toCH₄: Demonstration of a mobile unit for hybrid energy storage based on CO₂ capture and renewable energy sources



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What are the main objectives and the scope of the project CO₂toCH₄ ?



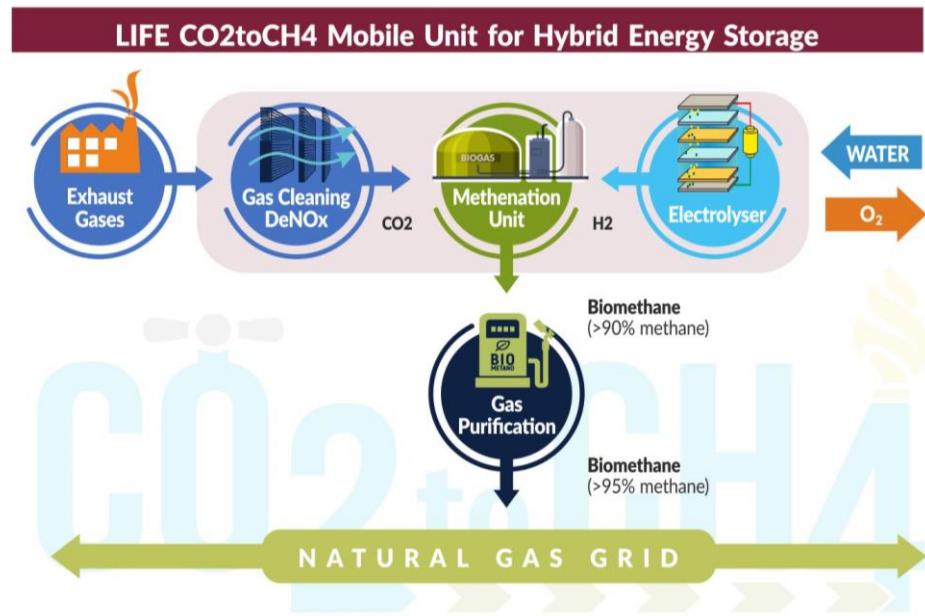
The Project

▶ Brief Description

The **construction, testing** and **operation** (TRL8) of an autonomous mobile unit for hybrid energy storage capable of being installed in remote energy systems (e.g., remote areas or islands that are not interconnected with the main energy grid).

▶ Basic Technology

The use of **Renewable Energy Sources** (RES) for the electrolysis of water, to produce H_2 and the **biological conversion of the produced CO_2** from the exhaust gases of power plants **into CH_4** (as a non-fossil biofuel).



Key Objectives

01



EFFICIENT ENERGY STORAGE AND CO₂, CAPTURE & UTILIZATION

By constructing, testing and operating (TRL8) a smart mobile unit for the hybrid energy storage able to be installed in remote energy systems that commonly have low capacity.

02



MAXIMIZE EFFICIENCY

By developing technically advanced systems and control architectures based on microbial resource arrangement

03



PROCESS SUSTAINABILITY

By demonstrating system evaluation and assessment of environmental, economic and social impacts.

04



MARKET EXPLOITATION

By identifying any safety, environmental, regulatory, or resource (economic) constraints that may affect its penetration into the market. By assessing the viability, cost and benefits of the proposed system.

05



REPLICATION, TRANSFERABILITY

By defining business requirements and critical success factors that must be met.

06



PROMOTE PUBLIC AWARENESS ON CLIMATE CHANGE MITIGATION & CIRCULAR ECONOMY CONCEPTS

By fostering employment growth and increasing capacity building in relevant technologies for increased competitiveness. By contributing to the implementation of the EU policy and legislation.

Which are the main activities of PPCR and how are they associated with the project?



PPC Renewables

Profile

PPC Renewables S.M.S.A." is an **100% subsidiary** of PPC S.A., **founded in 1998**.

Forms of RES

Utilizes all forms of RES:

- **Wind**, • **Solar**, • **Hydroelectric**,
- **Geothermal** • **Biomass – Biogas**




Carbon Dioxide Reduction (CO₂)

PPCR achieved a reduction of:

446.297 tn of CO₂ emissions in 2022.

Current Projects

A pioneer, nationally and at the European level operating:

- **36 Wind Farms**, 
- **19 Small Hydroelectric Plants**, 
- **32 Photovoltaic Plants** 
- **1 Hybrid Power Plant.**

Portfolio

- **Current portfolio over 600MW**
- **Projects near or under construction around 900MW**
- Within the **next five years** aims to create an **expanded and diversified portfolio of RES and energy storage projects**, expected to reach **levels of over 5GW.**

PPC Renewables association with the project

CONTRIBUTION TO CLIMATE CHANGE MITIGATION

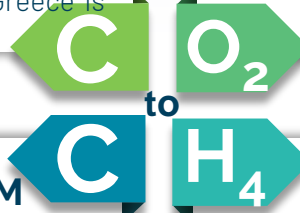
increasing electricity production from RES & reducing CO₂ emissions

- ✓ **LIFECO₂toCH₄** mobile unit will be able to **capture** and **convert ~9 kg CO₂/m³ reactor/day**.
- ✓ Using the **LIFECO₂toCH₄ system**, the combustion of **lignite** could be avoided.
- ✓ **LIFECO₂toCH₄** mobile unit could **produce 2.200 kWh/year** in full annual operation (avg annual electricity consumption in Greece is **5.000 kWh/household**).

INNOVATION

investing in new modern projects, utilizing all innovative renewable technologies to produce clean electricity

- ✓ **LIFECO₂toCH₄** project develops and demonstrating an **innovative** and **sustainable** system that converts exhaust gasses into green energy, resulting in the minimization of CO₂ emissions.



EXCESS ELECTRICITY STORAGE PROBLEM

- ✓ **Overcome** the barrier of the inefficient and expensive storage of excess electricity by using a mobile unit for hybrid energy storage **based on CO₂ capture** and **renewable energy sources**.

FOCUSING ON LOCAL COMMUNITIES

- ✓ **Comfort** the issue of **remote areas and islands** concerning the **high risk of a power outage** by using a competitive procedure for storing energy in a mobile unit.

Thank you

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