



STORAGE RESEARCH INFRASTRUCTURE ECO-SYSTEM

RI Information sheet 2022

CNR ITAE, Messina, Italy

STORECHEM-Net (Network of Chemical Energy Storage research facilities and equipment)

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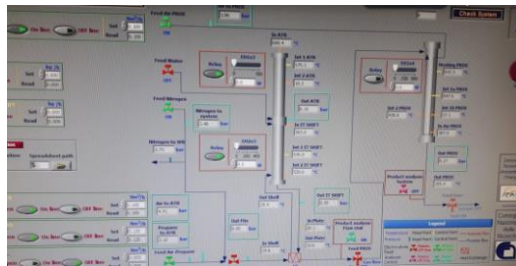
Project Acronym	StoRIES
Call	H2020-LC-GD-2020
Grant Agreement No.	101036910
Project Start Date	01-11-2021
Project End Date	31-10-2025
Duration	48 months

1. Photo

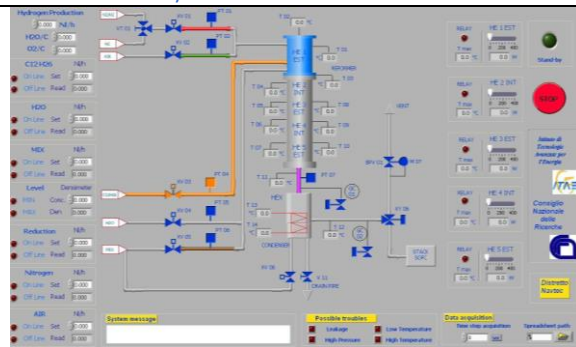
LOGO



Bench-scale test rings with an integrated cooling system dedicated to the conversion of CO₂ to Methane



Bench-scale test rings dedicated to the Ammonia synthesis



Lab-scale test rigs dedicated to CO₂ conversion processes and ammonia synthesis



<p style="text-align: center;">Scanning electron microscope</p> 	<p style="text-align: center;">Transmission electron microscope</p> 
<p style="text-align: center;">Temperature-Programmed Analysis</p> 	<p style="text-align: center;">BET Analyser</p> 
<p style="text-align: center;">X-ray spectrometer</p> 	<p style="text-align: center;">Rheometer</p> 

2. Geographical coordinates :

(38° ,9',003" N/S, 15° ,31',33.337" E/W)



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 101036910

3. Description of the research infrastructure for the webpage

Bench-scale test rings with an integrated cooling system: Dedicated to the conversion of CO₂ to methane and ammonia synthesis for the identification of the catalytic properties of structured and pellets catalysts. The plant is equipped with fixed-bed reactors (single or multi-tubular) for tests at high (500-600°C) and low (250-400°C) temperature. The test facility is provided with: mass flow controllers, pumps, valves, pressure regulators, IR analyse and thermocouples for axial and radial temperature profiles controlled from a PC via suitable software. Mass Flow range: 1– 10 Nm³/h.

- Lab-scale test rigs: Dedicated to CO₂ conversion processes and ammonia synthesis for the identification of the catalytic properties of the powder and structured catalysts. Fixed-bed reactor (Ø_{int}=0.6-2cm) that can operate at a temperature of up to 900°C, max pressure 4 bar, max feed rate ≈1000 cm³/min.. The plants are equipped with HPLC micro-pumps for liquid dosing and GC and/or online mass spectrometers.
- Chemical physical and morphological characterizations of materials state of the art equipment for catalysts and electrocatalysts characterization. The equipment list includes but not limited to: XRD, SEM, TEM, IR, UV-VIS spectrophotometry, BET, CHNSO.
- Fully equipped laboratory for the preparation of catalysts powders and catalyst-coated ceramic and metallic monolith, foams or 3D printed structures, including equipment for rheological studies.

4. Availability of the research infrastructure:

The infrastructure will not be available for StoRIES from [march 2022](#) to [march 2023](#).

5. Special considerations (confidentiality / NDA agreements, insurance requirement, special training, HSE training)

[To be defined](#)

6. Energy storage technology that can be analysed/studied by using the research infrastructure

- Electrochemical
- Chemical



- Thermal
- Mechanical
- Superconducting Magnetic
- Cross-cutting (Specifically: ...)

7. Key words for the webpage

Chemical Energy Storage, Electrochemical Energy Storage, CO₂ conversion to energy carriers, Materials characterization, Reactors and Devices tests stations, Ammonia, Synthetic Natural Gas, DME, Methanol

8. TRL level (if applicable):

- 1-3 X
- 4-6 X
- Above

