



ATENA

FUTURE TECHNOLOGY

## **H2RESTORE**

# ***Development of an integrated renewable energy storage system based on innovative hydrogen technologies***

### *Title*

H2RESTORE - Development of an integrated renewable energy storage system based on innovative hydrogen technologies

### *Project*

The H2RESTORE project aims to introduce an innovative, efficient and effective energy storage product, which aims to meet the need of increasing the renewable energy production, such as the energy from wind and photovoltaic plants, thus overcoming the critical issues due to the intermittency and unstable availability.

The H2RESTORE concept involves the integration of an electrolyzer, a hydrogen storage system and a fuel cell unit that by means of an optimal management strategy can allow to maximize the availability of electric energy from the renewable source. The implementation of safe and reliable technologies such as those based on metal hydrides, that allow the hydrogen storage at low pressure, as well as the use of PEM or AEM electrolyzers, confer a high level of innovation to H2RESTORE and foster the development of a technology aimed at supporting the exploitation of renewable sources and at promoting the ecological transition towards a zero-carbon economy.

Therefore, project ambition is to enhance the use of RES (renewable energy sources) up to 60% of the total electricity produced, in line with the PNR 2021-2027, by means of the introduction of a smart energy storage system which is capable of operating at different time scales.

H2STORE also opens to the possibility of using the conceived system for other purposes than that related to the electricity storage; in fact, the H2STORE technology could be marketed as an on-site green hydrogen generation unit for refueling stations, and as a cogeneration unit to meet electrical and thermal loads, thanks to its ability of recovering heat from the cooling of the PEM fuel cell unit.

The H2RESTORE technology will be designed as modular, containerized, fully engineered, and equipped with the auxiliary systems necessary for its installation at renewable energy generation sites, where the storage of electricity is crucial.

The project is in line with the strategic objectives of the Coordinator, which aims to expand its presence on the market, by proposing innovative hydrogen storage systems to be used in different sectors.



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## Info

*Type of project:* R&D

*Timing:* 2022/2023

*Budget:* 2.000.000,00

## Funding



## Coordinator

Graded SpA

## Partner

Atena – Distretto Alta Tecnologia Energia Ambiente  
Università degli studi di Napoli Parthenope

## Country:

Italy

## Address:

Centro Ricerche Atena