Rome hydrogen energy storage

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Conceived by ENEA, the National Agency for New Technologies, Energy and Sustainable Economic Development, the project will develop a national supply chain for production, transport, storage and use of hydrogen, focusing on research, technologies, infrastructures and innovative services.

Universities, research institutes, associations and companies will all play a part in the project to help it reach its full potential and boost the energy transition and decarbonisation across the country.

Construction will take place at the ENEA Casaccia Research Centre, on the outskirt of Rome, which will be the new home to an ensemble of hi-tech infrastructures for research and experimentation in the hydrogen supply chain.

Operations at the centre will range from production to distribution, from storage to use as a raw material for clean fuels production and as an energy carrier, to CO2 emissions reduction in the industry, mobility, power generation and residential sectors.

“In this multifunctional, comprehensive hub all the potentials of hydrogen to accelerate research and innovation and make hi-tech infrastructures available to bridge the gap between the lab and industry will be explored”, explained Giorgio Graditi, Head of the ENEA Department of Energy Technologies and Renewable Sources and ENEA representative in the European Clean Hydrogen Alliance.

“In order to create the first large-scale demonstrator of the actual feasibility of an hydrogen-based green economy, we will fully exploit the potential of our Casaccia Research Centre – over 100 hectares in area- hosting approximately 1000 researchers, important infrastructures and research laboratories, near 200 buildings, an autonomous gas and electricity network, roads and services.”

by Paolo Deiana, Stephen McPhail - Energy Storage, Batteries and Technologies for Hydrogen Production and Utilization Laboratory; Giulia Monteleone - Head of Energy Storage, Batteries and Technologies for Hydrogen Production and Utilization Laboratory

Within the Casaccia Research Centre of ENEA two gas pipelines will be laid down, fully equipped with auxiliaries and serving various end uses: one pipeline for pure hydrogen and the other for blends of natural gas and hydrogen. These pipelines will connect the sources of hydrogen production (driven by renewable energies) with the end use applications distributed throughout the centre to give rise to a true hydrogen ecosystem.

Finally, in-depth studies, analyses and engagement will be carried out vis-?-vis the regulatory and normative dimension of the Hydrogen Demo Valley, in order to systematically address safety matters, permitting and

other administrative procedures, as well as public acceptance of hydrogen in all its aspects.

The main goal of the project is to create an integrated infrastructure that aims to demonstrate the feasibility, functionality, sustainability, resilience and safety of a hydrogen-based ecosystem, as well as to offer industry the possibility to experiment and validate, in a dedicated ecosystem, the technological solutions with different TRLs, on a significant scale.

Specifically, it is planned to build and operate multifunctional infrastructures that will allow, with a technology neutral approach, the demonstration and integration of hydrogen technologies to help achieve energy transition objectives in the short and longer term.

The objective is therefore to create and test, within this framework, the integration of processes and infrastructures relating to different links in the supply chain: