Clean Hydrogen Partnership
Co-funded by the European Union
Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Genova, 9th February 2023

PRESS RELEASE: EU and Swiss-funded project FLEX4H2 launched
The FLEX4H2 project aims at moving technological frontiers for low-emission combustion of hydrogen beyond the latest state-of-the-art

The "FLEX4H2" project – Flexibility for Hydrogen – started officially on 1 January 2023. The project, led by Ansaldo Energia, is jointly funded by the EU Horizon Europe Research and Innovation Framework Programme under the Clean Hydrogen Partnership (GA No. 101101427) and the Swiss Federal Department of Economic Affairs, Education and Research, State Secretariat for Education, Research and Innovation (SERI). FLEX4H2 has an overall budget of approximately EUR 8.7 mil. and will run for four years, between January 2023 and December 2026.

FLEX4H2's goal is to support European ambitious climate targets towards shifting away from the use of fossil fuels. In this context, utilisation of hydrogen offers a unique chance to decarbonise the power generation sector reliably, independently from weather or seasonal conditions, contributing to the ongoing effort in the fight against climate change, enabling CO_2-free, dispatchable power generation.

FLEX4H2 aims to develop a fuel-flexible combustion system and will contribute to the EU Green Deal towards decarbonisation of the electric power sector.

The aforementioned goal translates into the project's main objective – to design, develop and validate a safe, efficient and highly fuel-flexible combustion system capable of operating with any concentration of hydrogen blend up to 100% H_2. Crucially, this objective will be pursued at the most challenging hydrogen combustion conditions, i.e., at H-Class operating temperatures, required for highest cycle efficiency, while still meeting emission targets without any use of diluents. The design of the combustor will be based on Ansaldo Energia's Constant Pressure Sequential Combustion technology (CPSC) and will be demonstrated in a stepwise approach, at full gas turbine operating conditions (TRL6).

"Decarbonisation of gas turbine assets is a fundamental part in the transition of the energy landscape. One single engine, equipped with the novel FLEX4H2 combustion system, has the potential of eliminating up to 2,000,000t CO_2 emissions per year, whilst delivering enough clean energy to supply up to 500,000 households," Federico Bonzani, Director Product and Technology at Ansaldo Energia stated.

The new, improved combustor design will be fully retrofittable to existing gas turbines, thereby providing significant opportunities for refurbishing existing assets. Furthermore, FLEX4H2 will present credible pathways for comprehensive exploitation of the project's results and (thereby) provide the basis for a firm contribution to the EU Green Deal towards decarbonisation of the electric power sector by 2030 and beyond.

The FLEX4H2 consortium includes nine partners from six European countries: Ansaldo Energia (IT), Arttic Innovation (DE), Centre Européenne de Recherche et de Formation Avancée en Calcul Scientifique – CERFACS (FR), Deutsches Zentrum für Luft- und Raumfahrt – DLR (DE), Edison (IT), ETN Global (BE), Sintef Energi (NO), Ansaldo Energia Switzerland (CH), Zürcher Hochschule für angewandte Wissenschaften – ZHAW (CH).

More information on the project can be found at: https://flex4h2.eu/

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Project details

Project Grant Agreement: 101101427

Start Date: 01/01/2023

Project Duration: 48 months

Project Budget: € 4,872,197.50 | EU contribution: € 4,178,517.25

The project is supported by the Clean Hydrogen Partnership and its members.

The Swiss partners, participating in the project, are receiving a further contribution of 4,012,475 CHF from the Swiss Federal Department of Economic Affairs, Education and Research, State Secretariat for Education, Research and Innovation (SERI).

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