Press release

Berlin, November 16, 2026

HyCoFlex Funded R&D project demonstrates 100% hydrogen-fired industrial cogeneration

Partners in the HyCoFlex Funded R&D project have achieved several key “firsts” and further validating a power-to-hydrogen-to-power-and-heat pathway for real-world deployment. In addition to running at full load at 100% hydrogen with low emissions, the Siemens Energy SGT-400 gas turbine offered cogeneration operation at those levels and extended the whole operating range including start-up.

Through an extensive testing campaign now concluded at the Smurfit Westrock paper mill in Saillat-sur-Vienne, France, the HyCoFlex Funded R&D project used 100% renewable hydrogen in a fully integrated combined heat and power (CHP) plant to produce both electricity and industrial steam. Across a wide range of operating conditions, the HyCoFlex Funded R&D project expanded the operational envelope of hydrogen-fueled CHP systems, demonstrating stable low-emission performance. The project builds on the successful EU-funded R&D project HYFLEXPOWER at the site, which showed that local hydrogen production and its efficient conversion into electricity can be integrated and operated in a CHP plant.

The installed Siemens Energy SGT-400 gas turbine can generate up to 12 MW of electrical output and 20 MW of thermal output. A key milestone was the successful operation of the integrated gas turbine and heat recovery steam generator (HRSG) cogeneration system at full load using 100% hydrogen. While earlier demonstrations focused primarily on hydrogen-fueled electrical power generation, the HyCoFlex Funded R&D project expanded the scope to the entire cogeneration process, demonstrating the simultaneous production of electricity and industrial steam under real-world operating conditions.

During the test campaign, the industrial gas turbine, equipped with advanced high-hydrogen dry low emissions (DLE) combustion technology, successfully operated on 100% hydrogen throughout the operating range including full load while maintaining low NOx emissions. The project also marked the first demonstration of a DLE gas turbine running on 100% hydrogen throughout an entire operating cycle at an industrial site, from ignition and start-up to grid synchronization, full-

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load operation, load reduction, and controlled shutdown. The unit could be started successfully on hydrogen alone without requiring a start-up fuel.

The plant successfully operated across a wide range of hydrogen-natural gas fuel blends and load conditions, including rapid changes in hydrogen content and power output, while maintaining stable and low-emission performance. The test campaign generated a comprehensive dataset on emissions and operational performance for both pure hydrogen and blended-fuel operation.

Ertan Yilmaz, HyCoFlex Funded R&D Project Coordinator at Siemens Energy, said: "With the HyCoFlex Funded R&D Project, we have demonstrated that hydrogen-fired gas turbine cogeneration can deliver both decarbonization and operational flexibility at industrial scale. By operating a CHP system on 100% hydrogen at full load while simultaneously producing power and steam, we have taken an important step toward bringing this technology from innovation to industrial application."

"We are very pleased with the success of the HyCoFlex Funded R&D project, which demonstrates that renewable hydrogen has a real role to play in industrial decarbonization, notably by replacing fossil fuels in combustion processes. Turning innovation into proven solutions under real operating conditions is essential to accelerate the deployment of hydrogen where it can deliver the greatest decarbonization impact," added Florian Chevallier, Managing Director of ENGIE Hydrogen for Local Energy Infrastructures.

Garrett Quinn, Smurfit Westrock Head of Sustainability, Branding & Communications summarized: "The HyCoFlex Funded R&D project demonstrates what can be achieved when industrial partners and research institutes collaborate to test new technological approaches under real operating conditions. The successful use of 100% renewable hydrogen to produce both electricity and process steam at our Saillat mill is an important milestone and provides valuable insight into the potential role of hydrogen in industrial decarbonisation."

About the HyCoFlex Funded R&D project

Building on the infrastructure and achievements of the HYFLEXPOWER EU-funded R&D project, the HyCoFlex (Hydrogen for Cogeneration in Flexible Operation) Funded R&D project is developing a retrofit solution for gas turbine-based combined heat and power (CHP) plants to run on up to 100% hydrogen. Coordinated by Siemens Energy, the consortium comprises ENGIE, Smurfit Westrock, Equinor, the German Aerospace Center (DLR), the National Technical University of Athens (NTUA), PNO Innovation, and CENTRAX.

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HyCoFlex
Funded R&D Project

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