

GE Is Awarded \$6.6 Million in US Federal Funding to Develop Breakthrough Technologies to Help Achieve 100% Hydrogen Combustion in GE's F-Class Gas Turbines

- *U.S. Department of Energy's (DOE) investment accelerates GE's progress toward 100% hydrogen combustion for the largest installed base in the US, generating approximately 60% of power in the country*
- *Ten US power plant utilities provided Letters of Support for GE's proposal with 2 indicating potential interest in field testing next generation of hydrogen combustion technology*
- *GE is a world leader in advancing hydrogen technologies: this project represents a major catalyst to accelerate an F-class hydrogen combustion technology demonstration*

GREENVILLE, SC -October 11, 2022 - GE announced today the successful completion of the award negotiation phase for the company's proposed project "**Advanced Mixed Mode Combustor for Hydrogen F-Class Retrofit.**" GE will receive \$6.6 million in federal funding from the U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management to accelerate the transition towards a 100% hydrogen combustion future for its F-class gas turbines. This funding will allow GE to develop and test breakthrough technologies to burn higher levels of hydrogen in its F-class gas turbine fleet, presently the company's largest installed base with more than 1600 units in the world. GE Gas Power's project was part of the six selected projects announced by the DOE on May 19, 2022, which also includes a [GE Research project](#) focused on the study of the operation of hydrogen-fueled turbine components.

GE received letters of support for this proposal from 10 US utility companies with an aggregate 240 gigawatts of total installed generation capacity serving approximately 81 million people across 39 states. GE also received a letter of support from a US-based independent, non-profit organization that conducts research and development related to power generation. These entities recognized



the importance of developing gas turbine capabilities for power generation utilizing lower carbon fuels, such as hydrogen and hydrogen blends. Multiple utilities expressed interest in potentially contributing to technical reviews during the project period, while two other utilities expressed interest in potentially hosting future H2 projects with GE's next generation H2 combustion technology.

"We are thankful for our customers' recommending GE for this funding opportunity, in alignment with their respective carbon reduction visions, and grateful for the DOE's commitment and investment in this project," said Jeffrey Goldmeer, Emergent Technologies Director at GE Gas Power. "Our objective is to develop and test a retrofittable F-Class staged combustor module with fuel capability ranging from 100% natural gas to levels up to 100% hydrogen. This award represents another key milestone in GE's efforts to provide power plant operators with retrofit options that will allow them to transition their GE gas turbine F-class assets, the largest fleet installed in the U.S, generating approximately 60% of power in the country, to operation on hydrogen resulting in lower CO2 emissions while maintaining NOx levels and overall gas turbine performance—positioning our customers for a lower-carbon future."

As part of this program, the project team will address the challenges associated with highly reactive hydrogen combustion dynamics, starting with the study of micro mixer and axial fuel staging technologies. Both technologies, from the proven HA-Class combustion system, enable great load flexibility and have excellent premixing and operability over a range of fuels including up to 50% hydrogen. The concepts will be tested at the Center for Advanced Turbomachinery and Energy Research facility at the University of Central Florida and then validated at GE Gas Turbine Technology Laboratory in Greenville, South Carolina.

GE, through its Gas Power business and Research Lab, brings a legacy of experience to the challenge of high hydrogen combustion. GE's Gas Power engineering team in Greenville, SC and GE's Research Lab in Niskayuna, NY offer a world-class combustion team with deep expertise and decades of hydrogen experience and fully capable build-and-test facilities for studying hydrogen



combustion and flame characteristics.

Over the past years, GE has collaborated with DOE to research and develop combustion solutions for more sustainable power generation. GE's DLN2.6e combustion system that is standard on GE 9HA.01, 9HA.02 and 7HA.03 gas turbines was developed as part of the DOE's High Hydrogen Turbine program. This technology has enabled the DLN 2.6e combustion system to operate on blends of natural gas and hydrogen. Further, GE has a technology roadmap to achieve 100% hydrogen in this platform in the next decade. GE has more than eight million operating hours on hydrogen and similar low-BTU fuels from more than 100 units.

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