The U.S. Department of Energy's (DOE) Office of Fossil Energy (FE) has announced $6.4 million in federal funding for cost-shared research and development projects under the funding opportunity announcement (FOA) FE-FOA 0002397, *University Turbines Systems Research (UTSR) — Focus on Hydrogen Fuels*.

The UTSR Program conducts cutting-edge research to increase the efficiency and performance of gas turbines while lowering emissions. There is renewed interest in the use of hydrogen, a clean-burning fuel, for turbine-based electricity generation. Hydrogen production from fossil fuels, coupled with carbon capture, utilization, and storage, can generate low-cost hydrogen with net-negative carbon emissions. Waste plastics could be added to the fuel mix to produce large quantities of hydrogen and to mitigate the impact of plastics in the environment.

This FOA focuses on fundamental and applied research to enable the use of hydrogen as a gas turbine fuel. Selected projects will support university-based R&D to resolve fundamental scientific challenges and applied engineering issues of combustion turbines fueled with pure hydrogen, hydrogen and natural gas mixtures, and other carbon-free hydrogen-containing fuels. The projects will study combustion issues in combined and in simple cycle applications.

The National Energy Technology Laboratory (NETL) will manage the projects. The FOA will seek to fund laboratory/bench-scale R&D in three areas of interest (AOIs):

- **AOI 1: Hydrogen Combustion Fundamentals for Gas Turbines**. Research undertaken in this AOI will study the fundamental combustion phenomena of hydrogen-containing fuels, over a broad range of fuel compositions and combustion conditions.
- **AOI 2: Hydrogen Combustion Applications for Gas Turbines**. The goal of this AOI is to study hydrogen-containing fuel combustion phenomena under various gas turbine conditions. The research could be used to design stable, high-temperature, and low-emission gas turbine combustors for hydrogen-containing fuels.
- **AOI 3: Hydrogen-Air Rotating Detonation Engines**. This AOI aims to replace the existing deflagration combustion process with detonation, utilizing rotating detonation engines (RDEs) to increase the total pressure at the exit of the combustor and boost thermodynamic efficiency. Applications in AOI 3 must address issues related to RDE combustion and ultimate integration with turbomachinery for power generation.

Applications must be submitted by February 1, 2021.

DOE anticipates selecting up to eight projects for this FOA. For more information, visit FedConnect.

The Office of Fossil Energy funds research and development projects to reduce the risk and cost of advanced fossil energy technologies and further the sustainable use of the Nation's fossil resources. To learn more about the programs within the Office of Fossil Energy, visit the Office of Fossil Energy website or sign up for FE news announcements. More information about the National Energy Technology Laboratory is available on the NETL website.

Source: **U.S. Department of Energy to Invest $6.4 Million to Develop Hydrogen-Fueled Turbines**