ENABLEH2 Session EASN

Presentation 3:
Benefits of ENABLEH2 Numerical and Experimental Hydrogen Micromix Combustion Research for the Stationary Gas Turbine Industry

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Power generation is experiencing a fundamental global transformation: energy requirements will no longer solely rely on fossil fuels but will increasingly move towards renewable energy sources. All the main Energy sector players are taking a leading role in driving and shaping the transition to a decarbonised energy mix, which is in line with the EU's 2050 goal of a climate neutral economy.

Today, gas turbines, which mainly run on natural gas, are core components of Europe's energy system. Gas turbines play an important role in the energy mix as they deliver on-demand, reliable and efficient power and heat, independently of weather conditions. This technology will be of even higher value in a carbon neutral energy system based on variable renewables, which will need constant available power. The gas turbine sector supports the decarbonisation of the EU energy system by offering solutions which will convert a large variety of renewable energy fuels and progressively replace natural gas.

To deliver technologies that can operate with a renewable gas, such as hydrogen, the Energy industry must rely on fundamental research and innovation work, such as ENABLEH2, to provide:

1. Insight into the types of flames and combustion regimes required to minimize harmful Nitrogen Oxide [NOx] emissions when burning hydrogen.
2. Valuable flame and emissions data, at Gas Turbine operating pressures and temperatures, to further improve
    a. The design Space knowledge required to create new ultra-low NOx combustor concepts, or to retrofit existing engines
    b. The Numerical tools used to assist in the design and analysis of these system

Without this valuable technical knowledge, along with economic viability and safety assessments, the Energy industry would solely have to rely on expensive and time consuming engine tests to mature the technologies required to transition Gas Turbine operation to higher and higher hydrogen content fuels.