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Description

The project aims to develop a computational platform for the virtual testing of industrial combustors using High-Performance Computing (HPC). It uses an advanced modelling strategy based on high-fidelity numerical simulations and HPC-based data analysis tools to obtain quantitative information about combustion performance in terms of combustion dynamics, pollutant formation and burner operability, for conventional fuels with hydrogen-enrichment. To cope with current EU decarbonization targets and to remain competitive at the European level, the project will enable the integration of this HPC-based platform into the design and optimization cycle of the new low-NOx injectors for hydrogen-enriched mixtures in the model JBM-6.000-G from EMC.

The methodology proposed is a multidisciplinary approach based on a combined effort between experiments and high-fidelity numerical simulations. This project is a collaboration between the Barcelona Supercomputing Center (BSC) and the Spanish SME E&M Combustion (EMC), which provides customized solutions for industrial combustion systems. The experiments will be conducted by EMC in their existing power plant, while the computational model developments and simulations will be conducted by BSC. Using advanced HPC simulations will bring an important step towards digitalization, which will contribute to increasing EMC's competitiveness and access to the low-carbon technology market with carbon-free solutions for power generation.

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

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