



Eni and CFS announce the accomplishment of an important milestone towards achieving magnetic confinement fusion

A safe, sustainable and inexhaustible source of energy that will reproduce the principles underlying the generation of solar energy

San Donato Milanese (Italy), 8 September 2021 – Eni announces that CFS (Commonwealth Fusion Systems) has successfully completed the test aiming to demonstrate the operation of the innovative magnet for plasma fusion confinement, for the first time made with HTS (High Temperature Superconductor) technology.

CFS is a spin-out company of the Massachusetts Institute of Technology's Plasma Science and Fusion Center, established in 2018, of which Eni is relevant shareholder.

Magnetic confinement fusion, a technology never tested or applied on an industrial scale before, is a safe, sustainable and inexhaustible energy source that reproduces the principles through which the Sun generates its own energy, ensuring an enormous quantity of it with zero emissions and representing a turning point in the path of decarbonization.

The technology under testing is key in the framework of magnetic fusion research, as it represents a fundamental step to create the conditions for controlled fusion, making possible its use in future demonstration plants. Studying, designing and building machines that can operate in physical reactions similar to those taking place at the core of the stars is the technological goal that the greatest minds in the world of energy research are striving for.

Eni's CEO, Claudio Descalzi, commented: *"The development of innovative technologies is one of the pillars of Eni's strategy, that aims at the complete abatement of emissions from industrial processes and products, and is key to a just and successful energy transition. For Eni, magnetic confinement fusion holds a pivotal role in the technological research for decarbonization, as it will consent humanity to access large quantities of energy produced*

in a safe, clean and virtually inexhaustible way, without emissions and changing for good energy generation standards, while contributing to an epochal breakthrough in the direction of human progress and quality of life. The extraordinary result obtained during the test once again demonstrates the strategic importance of our research partnerships in the energy sector and consolidates our contribution to the development of game changer technologies.”

In the context of its strategy of energy transition towards decarbonization, Eni has long started a broad program of fusion that commits on several fronts: Eni has been a shareholder of CFS since 2018 and has been cooperating with the Plasma Science and Fusion Center of MIT on a scientific joint research program called LIFT (Laboratory for Innovation in Fusion Technology) aimed at accelerating the identification of solutions in terms of materials, superconducting technologies, physics and plasma control.

The test concerned the superconducting technologies and it showed the possibility of maintaining the magnet in the superconducting regime with a high stability of all the fundamental parameters for its use in a fusion power plant. The innovation will contribute to a significant reduction in plant costs, ignition and maintenance energy of the fusion process and in the general system complexity, nearing the time and reducing the effort to build a demonstrative plant that will produce more energy than that required to maintain the fusion process (net energy production plant). This will subsequently allow to construct and conveniently deploy power plants throughout the world, connecting them to the electricity grid without expensive custom-made generation and transport infrastructures.

On the basis of this important achievement, CFS confirms its roadmap and intends to build the first experimental device with net energy production named SPARC by 2025, followed by the first demonstration plant, known as ARC , that could start feeding energy into the grid over the next decade, according to schedule.

SPARC will be built by assembling a total of 18 identical HTS magnet coils (similar to the one tested), in a toroidal configuration (a doughnut shape named “tokamak”) to generate a magnetic field with the strength and stability necessary to contain a plasma of hydrogen isotopes at temperatures of around 100 million degrees, at which the fusion of atomic nuclei can occur with the release of a very high quantity of energy.

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