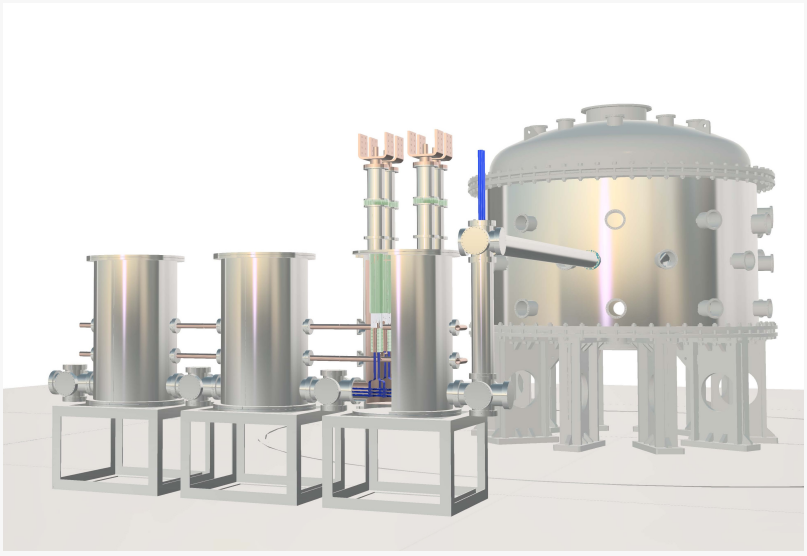
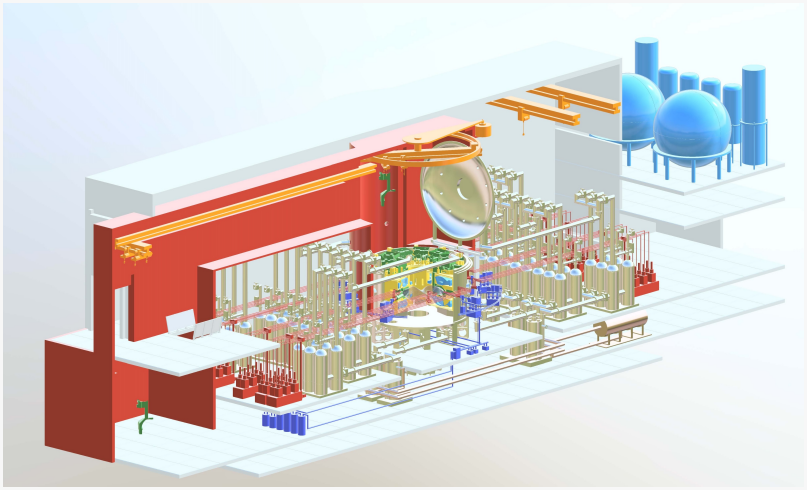
Helical Fusion and Toshiba Team Up on HTS Technology for Fusion Energy

Aiming for the world's first commercial fusion reactor, the two companies will co-develop current leads for cutting-edge high-temperature superconducting coils.



Concept image showing current leads systems with fusion vacuum chamber (created by Helical Fusion)



Concept image of the steady-state net power fusion plant "Helix KANATA" under development by Helical Fusion

TOKYO, JAPAN, July 17, 2025 /EINPresswire.com/ -- Helical Fusion Co., Ltd. ("Helical Fusion"), a private fusion power plant developer based in Japan, has signed a basic agreement with Toshiba Energy Systems & Solutions Corporation (Toshiba ESS) to begin exploring a joint development of current leads for high-temperature superconducting (HTS) coils used in commercial fusion power plants.

As part of its flagship "Helix Program" (see press release), Helical Fusion aims to begin operation of its first pilot plant—Helix KANATA—in the 2030s, targeting steady-state operation, net electricity generation, and high maintainability. To achieve this, the company is developing high-performance magnetic field coils and related systems based on proprietary HTS technology.

Toshiba ESS brings extensive experience in superconducting technologies for fusion, including its contributions to world-class experimental devices such as the Large Helical Device (LHD) at the National Institute for Fusion Science and the JT-60SA at the National Institutes for Quantum Science and Technology. Toshiba ESS has deep expertise

spanning the design, fabrication, and installation of superconducting coils, as well as cryogenics and current feed technologies.

Helical Fusion Logo

Under this agreement, the two companies will jointly pursue the development of current leads that can efficiently and stably deliver high current to HTS coils. The collaboration will combine Helical Fusion’s HTS cable technologies with Toshiba ESS’s capabilities in the design and manufacturing of current feed interfaces. The goal is to establish practical current lead solutions for future reactor-scale applications.

This partnership aims to accelerate the early commercialization of compact, high-output, and energy-efficient magnetic systems—an essential component for commercially viable fusion power—and contribute to the realization of a decarbonized society. Through this joint development effort, Helical Fusion and Toshiba ESS also seek to strengthen industrial competitiveness in the global fusion market and build a robust domestic technology base.

Comment from Takaya Taguchi, Co-Founder and CEO, Helical Fusion
"Establishing advanced HTS technology is not only critical for fusion energy but also a driver of innovation in other sectors such as medicine, aerospace, and aviation. We are excited to integrate our HTS technologies—developed from the world-leading research legacy of Japan’s National Institute for Fusion Science—with Toshiba ESS’s proven expertise in deploying advanced technologies into real-world infrastructure. We look forward to advancing the HTS supply chain and accelerating the path toward commercial fusion energy."

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