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USA: TRUMPF chosen to participate in Laser Fusion Energy Research Program

The U.S. Department of Energy has awarded $42 million to three new laser fusion “hubs” that will attempt to develop the technology as a viable future source of clean energy. TRUMPF is part of the engagement.

The Lawrence Livermore National Laboratory (LLNL),60 km east of San Francisco, California, is the leading research institution worldwide concerning laser-based fusion technology. Approximately one year ago, on December 5, 2022, the researchers there first achieved fusion with a net energy gain at the National Ignition Facility. The researchers have now been able to repeat this success three times, with an even higher energy yield.

The U.S. Department of Energy has now awarded $42 million to three new laser fusion "hubs" that will attempt to develop the technology into an environmentally friendly energy source for future generations. And TRUMPF is part of the engagement: together with academic institutions, U.S. national labs and other industrial corporations, the company will use its laser expertise to advance research into the fundamental challenges of fusion energy as an economically viable method of low-CO_2 energy generation. The common goal: to develop a viable plan for the construction of an Inertial Fusion Energy power plant. "For an Inertial Fusion Energy power plant to generate more energy than is needed to operate the laser, we would have to replace the pump sources from the 1980s with modern diode lasers. This would require significant capacity increases in the world´s laser diode production. We will work with the consortium partners to address the key questions of scaling, cost reduction and standardization of diode pump sources. We will also help produce a roadmap for the community," says Stewart McDougall, Head of research and development at TRUMPF Photonics in Cranbury, New Jersey, USA. The project will last for four years. "We have more than two decades of experience developing and commercializing diode laser pump sources for industrial solid-state lasers. Our expertise stretches across the entire value chain, from materials to full environmental and reliability testing and integration with the laser system. It will probably take decades before fusion power plants start operating and could become a profitable business. The fact that we are at the table as consultants for this future project naturally speaks for our expertise," says McDougall.

The efforts funded by the U.S. government are in support of the U.S. President's goal of demonstrating validated concepts for several different types of fusion power plants by 2032. TRUMPF itself does not receive funding for the project.

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