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DeepU Laser Drilling Technology is ready to Enter Field Testing Phase

European innovation aims to make geothermal energy cleaner, cheaper, and accessible anywhere

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The **DeepU project** has announced that its groundbreaking **laser drilling technology** is now ready for field testing, marking a major milestone in the quest to unlock affordable and sustainable geothermal energy.

After 44 months of intensive research, laboratory experiments, and computer simulations, the DeepU consortium has produced its **first operational prototype** — a system that uses a **laser beam and a supercritical nitrogen stream** to drill through rock without physical contact. The approach promises to cut costs, improve efficiency, and significantly reduce the environmental footprint of deep drilling operations.

Funded by the **European Innovation Council (EIC) Pathfinder programme** under **Horizon Europe (Grant Agreement No. 101046937)**, DeepU has been coordinated by the **University of Padua** and then **RED SRL**, in collaboration with **Prevent GmbH, Fraunhofer IAPT, Geoserv Ltd, the University of Wrocław, and Consiglio Nazionale delle Ricerche-IGG**, representing four European countries.

The newly developed prototype combines three essential functions in a single drill string and a drilling head:

- **Directing the laser beam** to drill rock with precision
- **Channeling the nitrogen flow** to remove particles and cool the borehole walls
- **Providing a robust structure** for the drilling operation

Beyond its technical achievements, the project identified optimal laser settings for different rock types, evaluated environmental and safety standards to ensure responsible deployment, and explored potential markets for large-scale technical applications.

“Reaching the field-testing stage is a key step toward making geothermal energy a reliable, cost-effective source available anytime, anywhere in the world,” said Luc Pockelé, Project Coordinator at RED SRL. “With DeepU, we can tap into the Earth’s heat in a cleaner, smarter way.”

By advancing to real-world testing, DeepU moves closer to its goal of **turning the planet’s natural heat into a practical, sustainable energy source** — helping Europe move towards a resilient, low-carbon future.

About DeepU

DeepU is a European research and innovation project funded by the **European Innovation Council (EIC)** under the **Horizon Europe** programme (G.A. **101046937**). The project develops an advanced laser drilling system designed to reduce the cost and environmental impact of accessing deep geothermal energy.

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