

Rwanda will host a company's 1st small-scale nuclear reactor testing carbon-free energy approach

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Rwanda's atomic energy board says it has signed a deal with a Canadian-German company to build its first small-scale nuclear reactor to test

what the company asserts is a new nuclear fission approach in one of the world's most densely populated countries.

Rwandan officials said Tuesday that the reactor won't produce any electricity for the country's grid. Instead, it will explore the technology developed by Dual Fluid Energy Inc. to address the need for low-carbon energy.

If all goes well, officials said, Rwanda and the company could set up a production line of such reactors in the central African nation as the country turns to nuclear power to help meet growing energy needs and adapt to climate change.

Much of the country's electricity comes from hydropower and diesel plants, according to the Rwanda Energy Group, and only about 68% of people have access to electricity.

Dual Fluid Energy, founded in Canada in 2021, is one of more than 20 small modular reactor projects in development—using various approaches and fuels—that were assessed in a [report this year](#) by the Organization for Economic Cooperation and Development's Nuclear Energy Agency.

According to the report, it's one of the projects in the earlier stages of development, including in licensing and sourcing a commercial supply of fuel.

[Small modular reactors](#) in general differ from larger conventional ones by requiring less fuel, offering more flexibility in location and having the ability to be prefabricated and shipped, according to the International Atomic Energy Agency. More than 70 commercial reactor designs are being developed worldwide, the IAEA said.

Dual Fluid Energy is pursuing a nuclear fission based on "liquid fuel and lead coolant" that it claims could produce emission-free electricity, hydrogen and synthetic fuels.

Rwanda's government said the reactor is expected to be operational by 2026, with testing of the technology to be completed by 2028.

There are major challenges ahead, experts say.

"Virtually all combinations of reactor coolants, fuels, moderators, power conversion cycles, etc., have been considered, analyzed at one point or another in the past 70 years. I'm skeptical they have something that we haven't seen before," Jacopo Buongiorno, nuclear science and engineering professor at the Massachusetts Institute of Technology, said in an email.

"I'm also quite skeptical about the timeline: Operational by 2026 in a country that has zero experience with nuclear technology seems very optimistic!" he added.

The design of the reactor has features that are interesting, but "it would require a lot of work to confirm that the design is feasible," said Juan Matthews, a visiting professor at the Dalton Nuclear Institute at the University of Manchester.

State-run The New Times reported that the deal was worth 90 billion Rwandan francs, or \$75 million.

The announcement comes a week after the [first Africa Climate Summit](#) issued a unanimous call for a shift to more low-carbon energy use along with a global tax on fossil fuels. Only South Africa has an operational nuclear power plant on the continent.

The CEO of the Rwanda Atomic Energy Board, Fidel Ndahayo, said the deal is part of a strategy of partnerships with startup companies developing small modular nuclear reactor technologies.

Rwanda, with more than 13 million people, is the most densely populated country in Africa.

Its atomic energy board was established in 2020, shortly after Russia and Rwanda signed an agreement to construct a nuclear science and technology center in Rwanda.

At the time, lawmaker Frank Habineza was a rare objecting voice. "Living near a nuclear energy plant is like living near a nuclear bomb which can explode and cause more damages," The New Times reported.

The government has said its nuclear ambitions are for peaceful purposes to help drive development.

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