

## May carbon dioxide turbine help address clean power generation?

April 13 2016, by Nancy Owano



GRC's Hofer says his "minirotor" could power a small town. Image credit: GE Global Research

(Tech Xplore)—"Desk size turbine could power a town"—wishful thinking turned into a headline? Not really. *MIT Technology Review*'s



header belongs to a report earlier this week by Senior Writer David Talbot.

He was talking about GE Global Research and how it is testing a desksize turbine that could power about 10,000 homes.

What makes this turbine work is not steam but carbon dioxide. "The unit is driven by "<u>supercritical carbon dioxide</u>," which is in a state that at very high pressure and up to 700 °C exists as neither a liquid nor a gas. After the carbon dioxide passes through the turbine, it's cooled and then repressurized before returning for another <u>pass</u>."

The unit is about one-tenth the size of a steam turbine of comparable output, said *MIT Technology Review*.

Eric Limer in *Popular Mechanics* said, "Instead of being pushed by steam, like most <u>power</u> plant turbines, the 'minirotor' as Hofer calls it is pushed by CO2. Not gaseous CO2, or liquid CO2, but CO2 so hot and pressurized that it forms what is called a supercritical fluid, a state of heat and pressure so extreme that the distinctions between liquid and gas basically cease to exist."

The *Daily Mail* showed a 3D-printed <u>prototyp</u>e of the turbine. This was a model that was 3D-printed from plastic, but the real version of the turbine is made from high-strength metal, said *GE Reports*.

*GE Reports* explained what the concept is all about: "The medium spinning this turbine isn't <u>steam</u> but <u>carbon dioxide</u>, squeezed and heated so high that it forms a supercritical fluid. At that level, the difference between gas and liquid basically disappears and gives the CO2 marvelous properties that the turbine harnesses for superefficient power <u>generation</u>."



This machine in size would be a significant departure from machines weighing several tons. "This compact machine will allow us to do amazing things," said Doug Hofer, <u>steam turbine</u> specialist at GE Global Research.

Hofer said in *GE Reports* that the technology is in its early stages of development and Hofer and team plan "to take it for a spin later this year."

What kind of impact could their <u>turbine</u> project have on energy challenges down the road? *GE Reports* said that "Hofer and his team are gathering insights that could allow them to scale the technology to the 500 megawatt range—enough to <u>power</u> a large city. The research could lead to smaller 'large' turbines that are more efficient in the future. "

More information: <u>www.gereports.com/this-scienti</u> ... -plant-in-hishands/

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