GE Global Research is exploring renewable energy system

March 11 2016, by Nancy Owano

Credit: GE

Tables are turned on declaring CO2 as one of the key enemies of mankind and the future, at least in one initiative. Scientists there have come up with a twist. While CO2 emissions are notorious contributors to

climate change, thinkers working in the realm of renewable energy are seeing CO2 not as either-or clean energy sources, but as an and-and.

They are exploring how a CO2-powered "sunrotor" can be used for clean electricity. In their plan, CO2 can actually be used to help us, not block us, to move from fossil fuels and toward renewable energy sources.

At GE Global Research, a team is out to demonstrate if we can actually use excess carbon dioxide produced by power plants to store extra solar power and deliver it back to the grid for later use.

Mark Egan wrote about the undertaking in *GE Reports*. Stephen Sanborn, senior engineer and principal investigator at GE Global Research (GRC), said, "We need to make renewable energy available to the grid when it is needed." That means finding an optimal way of energy storage. Sanborn and team's design involves storing some of the heat generated by thermal solar power plants in carbon dioxide.

International Business Times pointed out that the CO2, in the GE concept is used like a battery to quickly release energy when required.

Egan wrote how this involves power plants which concentrate solar rays with vast fields of mirrors; they use the heat to generate steam that spins a turbine; the carbon dioxide works like a battery that can quickly release energy during peak demand.

Egan went into further detail about their work, which has two main parts. The first collects heat energy from the sun and stores it in a liquid of molten salt. "This is the hot side of the solution," Sanborn said. The other component uses surplus electricity from the grid to cool a pool of liquid CO2 so that it becomes dry ice.

"During power generation, the salt releases the heat to expand the cold

CO2 into a supercritical fluid, a state of matter where it no longer has specific liquid and gas phases. It allows engineers to make the system more efficient. The supercritical fluid will flow into an innovative CO2 turbine called the sunrotor, which is based on a GE steam turbine design."

The turbine is small enough to fit on an office shelf, and yet it can generate as much as 100 megawatts of fast electricity per installed unit. That, said Egan, would be enough to power 100,000 U.S. homes.

GE is looking at a bigger picture, where the design could undergo a large-scale deployment—a renewable energy system to reduce the use of fossil fuels for power generation—storing significant amounts of power and delivering it to the grid when needed.

Egan said that Sanborn's goal is "to bring the cost to $100 per megawatt-hour, way down from the $250 it costs to produce the same amount in a gas-fired power plant."

BGR News Editor, Brad Reed: "It's going to take some time for this technology to come to market, however—GE is building a conceptual design of the turbine system right now." Steve Dent in *Engadget* said, "Looking ahead, Sanborn thinks that the energy storage system could be put into commercial use in as little as five to 10 years."

Carbon captured by coal plants would drive turbines that deliver power at night, said *Engadget*. Scientists could use CO2 as a giant "battery" to hold excess energy.

More information: www.gereports.com/this-scienti … e-clean-electricity/

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