

Can a greenhouse grow energy savings, too?

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Pacific Northwest National Laboratory will analyze the energy savings generated from the ClearEdge5 combined heat and power fuel cell system in a variety of smaller buildings on the West Coast as part of an award from the Department of Energy.

A grocery store, greenhouse, hotel and community college will be among a diverse group of West Coast organizations testing the next generation of fuel cells that produce both electric power and heat while saving energy, thanks to a \$2.8 million combined industry and government award announced today by the Department of Energy's Pacific Northwest National Laboratory. The federal portion of funding for this award was provided by DOE's Office of Energy Efficiency and Renewable Energy - Fuel Cell Technologies Program.

ClearEdge Power of Hillsboro, Ore., will install its ClearEdge5 combined heat and power [fuel cell](#) system at 10 different businesses in California and Oregon, while PNNL will monitor the systems and measure the [energy](#) savings the systems are expected to provide.

"Combined heat and power [fuel cell](#) systems can help smaller commercial buildings with high energy demands reap significant savings in energy cost and use," said Mike Rinker, the research program manager at PNNL. "We anticipate that this type of a system could reduce the fuel costs and carbon footprint of a commercial building by approximately 40 percent, compared with conventional electricity and heat use."

The ClearEdge5 system is compact - a little larger than a typical home's refrigerator. It is fueled by natural gas from existing, conventional pipelines. Inside the fuel cell system, natural gas is chemically broken down into a hydrogen-rich gas that reacts with oxygen in air to form energy, producing electricity with heat as a byproduct. The electricity produced by the fuel cell is used to power the building.

The excess heat generated by the fuel cell is released into the facility's heating, ventilation and air conditioning system to provide space heating to the building. Alternatively, the energy can be used for hot water or other needs for the facility. Excess electricity produced, but not consumed by the building, is then sold back to a local utility company. While the ClearEdge5 is not currently grid independent, future systems are being designed to operate during a grid outage, giving companies a continuous power advantage.

"ClearEdge Power employs more than 200 American citizens to design, manufacture and market our ClearEdge5 fuel cell system, an alternative energy power source that businesses and other organizations can take advantage of right now to both reduce their impact on the grid and to cut

carbon dioxide emissions by more than one-third," said ClearEdge [Power](#) President and CEO Russell Ford. "We are pleased that the DOE has taken a leading role with this initiative to help bring fuel cell technology to American businesses."

Each ClearEdge5 unit will have a high-speed internet data feed, allowing researchers at PNNL continuous access to analyze each installation's performance. PNNL will independently verify and analyze the engineering, economic and environmental performance and carbon footprint of these systems during the next five years. Then PNNL will provide its analysis in a report to DOE's Fuel Cell Technologies Program.

Provided by Pacific Northwest National Laboratory

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