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Ohio's now a leader in fuel cells

Industry could bring in thousands of jobs

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John Funk
Plain Dealer Reporter

As its old-line industries have failed, Ohio has tried to create a climate for high-tech manufacturing.

Now, after plowing about $52 million into research and other subsidies, the state is emerging as a leader in the fuel cell industry.

In the last six weeks, two fuel cell companies have announced plans to locate facilities here, potentially creating thousands of jobs as suppliers cluster around them. A third company has received a major federal research grant, and two more have announced other significant developments.

And on Monday, when the U.S. Fuel Cell Council convenes its annual conference in Honolulu, the Ohio Department of Development will co-sponsor the opening reception for the 2,500 participants. Ohio fuel cell makers, component suppliers and academic R&D heavy-hitters will once again create the "Ohio fuel cell corridor" on the floor of the trade show. Council spokesman Bud DeFlaviis said Ohio's aggressiveness has become the model for other states.

Fuel cells produce electricity by com- bining oxygen from the air with another element, usually hydrogen. They are touted as the future power source for automobiles, homes and all manner of consumer goods.

Simple in concept, fuel cell systems require sophisticated manufacturing in ceramics, polymers, metalworking, electrochemistry, electronics and other subsystems.

Ohio's advanced manufacturing expertise and skilled work force lead the list of assets that have sparked momentum here.

The state beefed up and focused its already strong engineering and scientific research capabilities with the creation of the Power Partnership for Ohio in 2003, which became the Wright Fuel Cell Group the following year. The statewide consortium of top university

researchers and industries is based in a 6,000-square-foot lab on the old Mt. Sinai property in Cleveland. At least 50 engineering professors and scientists throughout the state are part of the group.

Recent developments show the industry has taken notice:

Rolls-Royce PLC is creating a fuel cell subsidiary in the United States - Rolls-Royce Fuel Cell Systems (US) Inc. - to be based in North Canton, on the campus of the Stark State College of Technology in the new $4.7 million Fuel Cell Prototyping Center. The headquarters will open early next year and employ up to 50 engineers, technicians, executives and staff.

The British company also is contracting with American Electric Power of Columbus to test a one-megawatt fuel cell-micro turbine combination that could feed power into a utility's distribution lines. (A megawatt, 1 million watts, is enough power to supply about 600 homes.)

Rolls-Royce Fuel Cell has already partnered with Alliance-based fuel cell maker SOFCo-EFS and with OnPower Inc. of Lebanon, near Cincinnati, which will assemble the prototype fuel cell systems and develop the designs for an eventual Rolls-Royce factory. OnPower anticipates creating 134 jobs by 2011, including supply chain positions.

Rolls-Royce wants to market the fuel cell-micro turbine generators before the end of the decade. It hasn't said where it will make them.

"It's a bit early to speculate on that," said Mark Fleiner, president of the fuel cell subsidiary, but the company is focusing a lot of activity on the state. "Ohio has done a very good job of creating an environment to develop an industry around fuel cells, from people to components, to systems and subsystems. It's unique."

UltraCell Corp. of Livermore, Calif., plans to invest $74 million to build a factory near Dayton that will hire 360 people over the next four years and create more jobs for Ohio-based suppliers. The project has received grants, loans and tax breaks.

The initial customer for the 25-watt micro fuel cell will be the Air Force research lab at Wright-Patterson Air Force Base. The ultimate goal is to make a consumer product.

About the size of a hardbound book, the UltraCell gets hydrogen from methanol (the active ingredient in windshield-washer fluid) and can power a laptop computer for 72 hours on a single charge. Future versions will be smaller and more powerful.

The company is working with the University of Dayton and Case Western Reserve University.

"We like the automotive infrastructure in Ohio, the production in volumes that we will want - things that are not done well" in California, Chief Executive James Kaschmitter said. "We do silicon, not metal."

HydroGen Corp., formerly based outside Pittsburgh but now at the Wright Fuel Cell Group's Cleveland lab, will install and run a 400-kilowatt prototype fuel cell power plant at an Ashta Chemicals factory in Ashtabula. Ashta makes hydrogen as a manufacturing by-product. The fuel cell will use that hydrogen to generate power for use at the factory.

HydroGen plans to build a factory in Ohio in 2008 to produce 2-megawatt fuel cell systems and eventually to assemble systems as large as 30 megawatts. The plan is to market them to industrial companies like Ashta. By 2010, HydroGen expects to have about 200 Ohio workers.

"We are also strongly leaning toward Ohio suppliers," said President Joshua Tosteson. "The state has done everything in its power to attract and build a vital fuel cell manufacturing industry. With suppliers, you can see a cluster developing, a cluster of interdependent companies."

Defense contractor Ashlawn Group of Alexandria, Va., said the Army has successfully tested the tiny fuel cells that its Painesville-based Pemery Corp. has been hand-making since December. The military wants to substitute fuel cells for the short-lived batteries it uses in "smart" munitions, shells that steer toward a target.

About six weeks ago, fuel cells in the noses of 155-millimeter howitzer shells were able to generate power after the big guns fired the rounds, proving they could withstand the explosive shock. The cells would have a 20-year shelf life, as opposed to five years for the current batteries, said Ashlawn President Norma Powel Byron.

The Pentagon will need hundreds of thousands of fuel cells once the technology is proven, she said. Pemery expects to employ up to 400 by 2010.

Byron said she wouldn't have been able to start the company without help from Case researchers and state subsidies.

GrafTech International Ltd., a Parma-based maker of graphite electrodes with a 100-year history, is deep into fuel cell research, some of it paid for by state grants. Now GrafTech has won a $2.3 million federal grant to continue working on lighter, stronger graphite parts for automotive fuel cells.

Such power plants would have to be able to generate about 85,000 watts, operate at about 250 degrees and cost a few thousand dollars. In comparison, fuel cells to power a home would generate less than a tenth as much. GrafTech's grant is part of $100 million the Energy Department is investing in fuel cell research over the next three years.

The spate of announcements, especially the Rolls-Royce decision to place its headquarters here, indicates the state's future, said Lt. Gov. Bruce Johnson, who also heads the Department of Development.

Just this past week, Johnson said, he spent time with representatives from several Japanese fuel cell companies who had heard of the Rolls-Royce decision and wanted to know more about Ohio.

"When this starts happening, then the supply base follows," he said. "And pretty soon it doesn't make sense to be anywhere else."