

Partnerships Have Catapulted Stark State College To Be Leader in Fuel Cell Education

Stark State College of Technology in North Canton, OH, has become a leader in fuel cell education as a result of partnerships it has developed with business and industry, the State of Ohio and federal agencies. The outcome is that \$18.2 million in grants has been generated over the past five years to develop fuel cell curricula, support industry research and development, and prepare technicians for the emerging field.

The College's journey into fuel cells began in 2003 when it partnered with the Stark Development Board, Case Western Reserve University and SOFCo-EFS Holdings, a local developer of solid oxide fuel cells, on development of a Fuel Cell Prototyping Center on the Stark State campus. The partners were successful in receiving \$3.35 million in state Third Frontier funds to support construction of the Center. Other support for building and equipping the facility was subsequently received from the Ohio Board of Regents (\$625,000), the U.S. Department of Education (\$497,050) and the state legislature (\$250,000), and the College contributed \$500,000 to the project as well. Rolls-Royce Fuel Cell Systems (US) Inc., which bought SOFCo, now has its North American headquarters in the Center.

Once the building project was well underway, the College explored the National Science Foundation's Advanced Technological Education (ATE) program for academic program development. In 2004, the College received \$780,000 for a Fuel Cell Curriculum Development Project, which enabled the College to create a Fuel Cell Track within its Mechanical Engineering Technology (MET) program as well as partner with secondary education and Ohio universities on curriculum development and enhancement. Throughout the four-year project, the College continually expanded its relationships with fuel cell businesses in the region. The track has since been expanded to an option within the MET program, and the College has added a one-year Technical Certificate in Fuel Cell Technology as well as a Certificate of Competency in Fuel Cell Technology.

The College's partnership with NSF continues today as Stark State recently received \$1.6 million for a *Great Lakes Fuel Cell Education Partnership*, which is enabling the College to share and expand its program expertise with high schools, two-year colleges and universities in Indiana, Michigan, New York, Pennsylvania and Ohio. Fuel cell and related businesses in the five-state region also will support this partnership.

Other federal grant programs supporting fuel cell initiatives at the College include the U.S. Department of Labor, which provided \$429,536 to support technician training, and the U.S. Department of Education, which awarded \$1.25 million to Stark State for a five-year Upward Bound Math & Science program that introduces fuel cell technology to high school students. Also in 2008, the College received a \$787,200 grant from the U.S. Department of Energy for a *Fuel Cell Balance-of-Plant Reliability Testbeds Project* which is involving students in building and monitoring testbeds that determine the reliability of component parts of a fuel cell system. Lockheed Martin is the business partner for this project. This concept has been expanded in a recently awarded Ohio Third Frontier Fuel Cell Program grant to Lockheed Martin's *Military*

SOFC Genset Project, which will see Stark State students building and monitoring a third testbed for fuel cell system component parts.

Two more Third Frontier grants funding fuel cell developments on campus include \$3 million for the College's *Expansion of Industry/Education Partnerships for Fuel Cell Commercialization* project, which is expanding the Fuel Cell Prototyping Center to accommodate Rolls-Royce growth in personnel and R&D; renovating the nearby Advanced Technology Center to support fuel cell research and development by Contained Energy, LLC, a Cleveland-based company developing direct carbon fuel cells; and providing space for a dedicated fuel cell laboratory for the College's credit program. Another \$834,626 is coming to Stark State as a partner on Rolls-Royce's project, *Development of a High Pressure Stack Block Test System for a Fuel Cell Power Module Overhaul Facility*.

Most recently, the announcement was made of a \$1.45 million Federal grant to support development of a Fuel Cell Services Learning Center on the fuel cell campus. This new addition will serve as a world-class center to develop technicians and field service engineers who can work on RRFCS' fuel cell system and, in the long term, a variety of fuel cell products, developed by multiple companies and expected to reach commercialization in the future and in collaboration with Rolls-Royce Fuel Cell Systems (US), Inc., was awarded \$2.8 million for the expansion of Stark State's fuel cell test capabilities in support of Rolls-Royce's one megawatt solid oxide fuel cell development program for stationary power generation. The Ohio Third Frontier investment is in support of the development of fuel cell smart grid. The project will further strengthen fuel cell curriculum at Stark State and create employment opportunities for Stark State students.

The College's relationships with government, business and industry, community development organizations and higher education continue to grow as these sectors in Ohio work collaboratively to rejuvenate the economy with the development of emerging and advanced energy technologies. Today, 100 businesses and nonprofit and government entities form the Ohio Fuel Cell Coalition which has become known as the *Ohio Fuel Cell Corridor*. Forty-four percent of these members are located in Northeastern Ohio, where Stark State is located, forming a major concentration of resources dedicated to the technology which promises to create new companies and new high technology jobs in this emerging industry, for betterment of the state and nation.