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FUEL CELL COMPANIES

\$100 MILLION
in fuel cell components were purchased from OHIO SUPPLY CHAIN COMPANIES in 2015.

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WE MAKE

FUEL CELL COMPANIES POWERFUL

Northeast Ohio is a nexus for businesses in the growing fuel cell industry. Our region is home to component and materials suppliers, stack and systems integrators, equipment and service suppliers, and centers of research preparing the fuel cell workers of tomorrow.

The U.S. Department of Energy (DOE) report State of the States: Fuel Cells in America 2016 cites Ohio as a top fuel cell state for supportive policies and incentives, industry research and development, and business expansion. We offer the competitive advantage of a world-class supply chain and an integrated support system committed to fueling your success.

SUPPLY CHAIN STRENGTH

Northeast Ohio's manufacturing capabilities are integral to Ohio's fuel cell supply chain. In 2015, more than \$100 million in fuel cell components was purchased from Ohio companies. Components — including bipolar plates, stamped components and reforming technology, and balance of plant (BoP) from Ohio are in every fuel cell made in the U.S. Source: DOE State of the States: Fuel Cells in America, 2016

HERE ARE JUST A FEW OHIO-BASED COMPANIES INVOLVED IN THE FUEL CELL INDUSTRY:

Crown Equipment – fourth-largest manufacturer of powered industrial forklift trucks in the world and leading supplier of fuel cell-powered material handling equipment

Die-Matic Corporation – precision metal stamping company serving traditional markets as well as the fuel cell industry

Energy Technologies Inc. (ETI) – provider of electro-mechanical flight hardware and ground support equipment including fuel cell systems for the military

Honda – vehicle manufacturer that recently announced a joint venture with General Motors to build advanced hydrogen fuel cell systems for each company's next generation vehicles

Hyster Yale-Nuvera – integrator of Nuvera fuel cell technology into lift truck products

Johnson Matthey Process Technologies (formerly Catacel) – a leader in catalyst technologies

Kalf Manufacturing – expertise in precision machining and rebuilding services

LG Fuel Cell Systems – North American headquarters of this leader in utility-scale fuel cells

Nexceris – commercial solid oxide fuel cell materials, gas sensors, and catalyst and corrosion protection

Plug Power – Midwest region's first hydrogen fuel cell center with a global monitoring system for hydrogen dispensing infrastructures

Stark Area Regional Transit Authority – nationally recognized leader in the use of zero-emission technology, including hydrogen fuel cell buses

Technology Management Inc. (TMI) – developer of kilowatt scale/portable fuel cell systems for military and other markets

Every fuel cell manufactured in the U.S. has **Ohio components.**



OHIO COMPANIES INVESTED \$150 million in fuel cell development in 2015.

BUSINESS SUPPORT

Ohio has powerful organizations that support fuel cell companies committed to growing in the state – from providing capital to bringing together professionals interested in collaborating to advance the sector.

Ohio Third Frontier (OTF) is a \$2.1 billion initiative supporting new technology companies and fostering collaboration among industries, economic development agencies and universities to commercialize technology. OTF offers access to a network of resources providing capital, business expertise and mentorship. OTF has invested more than \$90 million in the development of fuel cells.



Ohio Fuel Cell Coalition (OFCC) is a group of more than 50 industry, academic and government leaders working collectively to strengthen Ohio's fuel cell industry and accelerate its global leadership in fuel cell technology. The OFCC is committed to advancing the integration of a coordinated, robust fuel cell infrastructure and supply chain.

Team NEO is an economic development organization focused on creating jobs for Northeast Ohio's residents. In collaboration with its partners, it leads the region's business attraction efforts, supports business retention and expansion work as Northeast Ohio's JobsOhio affiliate, accelerates the impact of innovation in the region, and aligns strategies and resources within the economic development network to maximize its impact. The organization facilitates networking, sharing and advocacy for the fuel cell industry.

Regional Hydrogen and Fuel Cell Collaborative (RHFC), works to make the Ohio region a US and global leader in renewable hydrogen in transportation. Focus areas include vehicle deployment, infrastructure, outreach and education, funding, legislation and research.

EDUCATION AND RESEARCH

With 26 accredited colleges and universities, and almost 400 more within a 150-mile radius, Northeast Ohio has the resources to prepare students for fuel cell technology careers.

Case Western Reserve University (CWRU) is a leader in fuel cell education and research and one of the top five universities in the country leading Advanced Research Projects Agency - Energy (ARPA-E) projects.

Lorain County Community College (LCCC) is producing experienced engineering, fuel cell and manufacturing talent, and is heavily involved in workforce training, incubation and funding within the industry.

Stark State College stands out as well, earning more than \$20 million in grants over the past eight years to develop fuel cell curricula, support industry R & D, and prepare technicians for jobs in this emerging field.

Kent State University, The University of Akron, and many other higher education institutions are noted for their fuel cell education and research efforts.

Northeast Ohio is also home to **NASA Glenn Research Center**, where fuel cell development and deployment have been part of the NASA space exploration agenda since the United States began planning its first moon landing.

The statewide **Ohio Manufacturing Extension Partnership** supports Ohio's small and medium-sized manufacturers by providing products, services and assistance to help drive their productivity, growth and global competitiveness.

Fuel Cell companies choose **Cleveland Plus**. From ideas to products to profits, **we make things here**. We make things happen.

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NEXT-GENERATION TRANSPORTATION

Ohio fuel cell technology is powering a fleet of hydrogen-powered city buses that the Stark Area Regional Transit Authority (SARTA) began deploying in 2016. The 10-bus SARTA fleet will be the third-largest fuel cell fleet in the nation by 2018. Its \$1.6 million refueling station was built with a grant from the Ohio Department of Transportation, while the buses were funded by local, state and federal grants.