

Other State Hydrogen & Fuel Cell Initiatives

Several states and regions across the nation have established various types of hydrogen and fuel cell programs which seek to advance research, implementation, and business development.

Programs are listed below by state and then broken out further into categories: Business, Government, Public-Private, and University. Business programs are listings of in-state companies working on research, development, deployment, and marketing activities. Government programs are those that relate to specific activities agencies and/or administrations are making to set standards, rules and regulations, and direct state purchasing towards hydrogen and fuel cell technologies. Public-Private listings are those that detail joint public and private sector partnerships, and the University programs detail work taking place at in-state colleges and universities.

This report does not detail state efforts to promote national legislation, nor does it detail any past, existing, or pending national programs.

The following information was compiled by Energy Independence Now from numerous sources. A listing of those sources is available upon request by contacting Rick Margolin at rmargolin@einow.org.

Arizona

- Public-Private – Since 2002, Arizona Public Service has operated the Alternative Fuel Pilot Plant in Downtown Phoenix. The facility dispenses hydrogen and natural gas for city fleet and demonstration vehicles. Hydrogen is produced through grid electrolysis. Project partners include the United States Department of Energy (US DOE), Idaho National Engineering and Environmental Laboratory, Bechtel, and the Pinnacle West Capital Corporation.
Arizona Public Service has also demonstrated the solar thermochemical production of hydrogen at its Tempe solar array.
- University – Arizona State University's Biodesign Institute has received \$1.5 million grant from the US DOE to develop catalysts for electrolysis.

Arkansas

- University – University of Arkansas-Little Rock's Nanotechnology Center of Excellence recently received \$1.4 million in federal funding to research the integration of hydrogen and solar technologies.

Connecticut

Connecticut's hydrogen and fuel cell programs should be regarded as one of the nation's most advanced. The state – which touts itself as the “fuel cell capital of the world” - is home to the nation's highest concentration of hydrogen-related businesses and is bolstered by the attraction of significant amounts of state and federal funding.

- Business – Connecticut is home to 11 original equipment manufacturers (OEMs), 24 suppliers, and 21 service-oriented businesses supporting the state’s hydrogen and fuel cell industries. Some of those companies include: Avalence, Fuel Cell Energy, GenCELL, Hamilton Sundstrand Space Systems, Praxair, Proton Energy Systems, Treadwell, and United Technologies Corporation.
- Public-Private – The Connecticut Hydrogen Fuel Cell Coalition is a public-private partnership whose mission is to advance the state’s research, development, and marketing efforts. The program is administered by the Connecticut Center for Advanced Technology, a tax-exempt corporation that manages industry’s, government’s, and academia’s technology development efforts.

A key member of the CHFCC, and one of the state’s primary sources of grant dollars is the Connecticut Clean Energy Fund (CCEF). The CCEF was created in 1998 as part of the state’s utility deregulation efforts and is funded through a surcharge included in utility bills which generates \$15-\$30 million per year. The CCEF receives its mandate from the legislator and consent from utilities and is directed to invest in defined clean-energy technologies, of which hydrogen and fuel cells are specifically identified. Since 2000, the fund has invested over \$52 million.

- University – The University of Connecticut is home to the Connecticut Global Fuel Cell Center, a collaboration of university engineering and chemistry departments and industry in order to advance fuel cell research, development, and deployment. The CGFCC has received over \$4.3 million to fund its work.

Naugatuck Valley Community College offers a fuel cell technology certification program that provides training on fuel cell manufacturing and operations.

Colorado

- Public-Private – The State has dedicated \$2 million in seed money to create the Colorado Fuel Cell Research Center at the Colorado School of Mines. The CFCRC would be a collaboration of the National Renewable Energy Laboratory, Gas Technology Institute, state government, and private companies to advance the research and development of fuel cells and create a fuel-cell industry for the state of Colorado.
- University – The Colorado School of Mines received in January a portion of a 5-year, \$1.5 million US Department of Energy grant to conduct fuel cell polymer membrane research.

Delaware

- Business – The state of Delaware is home to DuPont and W.L. Gore Industries, and is host to offices, research and/or production facilities for General Motors, DaimlerChrysler, Ion Power, and General Electric, all of which are conducting hydrogen and/or fuel cell research and development. Its main utility companies – Delmarva Power and Conectiv Energy – have renewable power and distributed generation programs that will have a hydrogen component.
- University – Delaware State University’s Center for Hydrogen Storage Research has received \$500,000 in federal funds to conduct research and testing.

Florida

Florida has one of the nation's most developed and aggressive state-sector hydrogen programs.

- Government – Governor Jeb Bush announced the 2006 Florida Energy Act, a suite of tax credits, rebates, and other incentives to diversify the state's energy portfolio through renewable power, hydrogen, and biofuels. The 4-year \$30 million program provides \$7.5 million for hydrogen vehicles, fueling stations, and stationary fuel cells.

The state's Hydrogen Energy Technologies Act is an amalgam of rules, regulations, and funding incentives for the private sector. It provides \$12.9 million for hydrogen testing and demonstration programs, \$2.1 million in tax incentives, directs the state to create public-private partnerships, and is working to develop a single, uniform permitting process for hydrogen infrastructure.

- University – Florida's colleges and universities have more than 100 hydrogen research and development programs. Schools with active programs include: University of Florida, Florida State University, Florida A&M, University of South Florida, University of West Florida, University of Miami, and University of Central Florida, which has received over \$7 million from NASA to conduct solar-hydrogen research.

Georgia

- University – The University of Georgia – Athens has received over \$1.3 million in US Department of Energy funds to research nanoscale solar-hydrogen production and storage.

Hawaii

Hawaii has, perhaps, the longest history of hydrogen research and development projects. Its US Senators and Representatives have consistently introduced hydrogen-related bills in Congress thanks to the tradition set by the late Hawaiian Senator Spark Matsunaga.

- Government – The state shares the costs of the Hawaii Hydrogen Power Park program: a 3-year, \$3 million effort to demonstrate onsite power generation from fuel cells. This year the state's Republican party proposed a bill to promote the state's energy independence by directing the state and encouraging consumers to purchase efficient and/or alternative vehicles, and providing incentives to increase the production of alternative fuels.
- University – In 1983 the state legislature created the Hawaii Hydrogen From Renewable Resources Program at the University of Hawaii – Manoa's Hawaii Natural Energy Institute. This program's effort focuses on advances in the production of hydrogen from renewable resources found on the Hawaiian islands. The program has been continuously funded by state and federal grants since 1986.

Idaho

- Business – The Idaho Synthetic Energy, Inc. recently received a US Department of Energy grant to construct a wind/grid-electrolysis hydrogen generation plant in Boise.
- Government – Home to Idaho National Laboratory, conducting research on hydrogen from methane and low-pressure hydrogen storage.

Illinois

In 2003, Illinois launched the “Illinois 2 H2 Partnership”, which developed the Illinois Hydrogen Highway Plan. The state is the fourth highest recipient of federal hydrogen research dollars, has significant public-sector support for hydrogen, and is host to several hydrogen, fuel cell, and engine companies.

- Business – Hyradix, UOP
- Government – State-level efforts are supplemented by the City of Chicago’s own programs, which are part of Mayor Richard Daily’s pledge to make Chicago the “Greenest City in America.” The city is developing the world’s first ethanol-to-hydrogen fueling station to fuel a fleet of 5 hydrogen vehicles.

The state is also home to the Argonne National Laboratory

- Public-Private – The Illinois 2 H2 Partnership and the Illinois Hydrogen Highway is a collection of members of the business community and state legislature dedicated to developing the state’s science and technology industries. The vision – laid forth in the Illinois Hydrogen Highway Plan - is to develop a network of 6 hydrogen-fueling stations along the Interstate 90 corridor by 2010 (2 are already in place). The program is was created by and is administered by the Illinois Coalition, which derives its operating costs with funding from the state’s Small Business Administration, federal grants, and private sector contributions.

A separate public-private partnership was established with UOP, SunLine Transit, and the US Department Of Energy to create the Hydrogen Facility. The partnership will install and test equipment for a hydrogen-from-natural-gas fueling station UOP’s Des Plaines campus.

Indiana

Indiana has a demonstration waste-to-hydrogen facility and is home to Purdue University, which is conducting advanced solar-hydrogen research.

- Public-Private – The ForeverGreen Waste-to-Hydrogen Facility is a partnership between ForeverGreen Industries and the Indiana Economic Development Corporation to develop a plasma-arc waste-to-hydrogen facility in DeKalb County. The hydrogen will be used for fueling vehicles and industrial applications. The project is estimated to create over 150 jobs.
- University – Purdue University has created a multi-disciplinary energy research program incorporating hydrogen-engineering programs into its curriculum. One program is researching photo-bio-electrochemical hydrogen generation, and another is developing vehicle-sized hydrogen storage systems.

Iowa

- Business – The Hydrogen Engine Center, Inc. recently went public with shares showing a significant jump in price. The company has received a zero-interest

loan from the city of Algona to expand its facilities to produce up to 4000 engines per year. The engines can run on gasoline, hydrogen, natural gas, ammonia, or propane.

- Government – In 2005 the state enacted the Renewable Energy Production Tax Credit, which provides tax credits for the production of electricity and fuels (including hydrogen) from eligible renewable sources.

The state is home to the Ames National Laboratory, which is conducting research in advanced hydrogen storage.

- University – Iowa State University has several hydrogen programs studying hydrogen production from biomass and – in partnership with Ames National Laboratory – advanced hydrogen storage research.

Massachusetts

Massachusetts has one of the highest concentrations of private sector, university, and non-profit entities conducting hydrogen and fuel cell research and development.

- Business – There are over 80 business and non-profit entities developing hydrogen and fuel cell-related technologies in Massachusetts. Notable companies include: Acumentrics, Analytic Energy, Beacon Power Corp., Cape Cod Research, Gilette, Northeast Advanced Vehicle Consortium, Nuvera Fuel Cells, Safe Hydrogen LLC, and ZTEK.
- Government – Created through legislation, the Massachusetts Fuel Cell Partnership works to grow the state's hydrogen and fuel cell industries by attracting and leveraging federal funding sources.

The state's Technology Collaborative has created the Massachusetts Renewable Energy Trust SEED (Sustainable Energy Economic Development) Program. Among its funding recipients is Safe Hydrogen, a 3-year, \$2.4 million project demonstrating solid-state hydrogen generation, storage and distribution.

In Massachusetts, the federal government operates the NASA Northeast Regional Technology Transfer Center, the US EPA's National Exposure Research Laboratory, and the US Department of Transportation's Volpe National Transportation Systems Center.

- Public-Private – The Massachusetts Hydrogen Coalition is a membership-based non-profit working to accelerate the growth of the state's hydrogen and fuel cell industries. It is composed of businesses, government agencies, universities, and non-profit organizations. It has developed the *Massachusetts Hydrogen Road Map*, and hosts member meetings and bi-annual conferences.
- University – Advanced hydrogen, fuel cell, and related technology research and development programs are well established at the University of Massachusetts, the Massachusetts Institute of Technology (MIT), Northeastern University, and Worcester Polytechnic Institute.

Michigan

Michigan has several well-developed and coordinated public-private and university initiatives to promote hydrogen and fuel cell research and development. The state has 4 existing and 2 planned hydrogen stations to complement several vehicle fleets.

- Business – Michigan is home to General Motors, Ford Motor Company, DaimlerChrysler US, and Ovonics.
- Government – NextEnergy is an initiative proposed by Governor John Engler to invest \$2 billion in grants, tax credits, and other incentives over 10 years in alternative energy research, design, manufacturing, commercialization, and education. The program is administered by the Michigan NextEnergy Authority (MNEA), a seven-member board composed of top-level state officials and four private sector representatives appointed by the Governor. To date the initiative has awarded over \$2 million, created an Alternative Energy Zone where businesses can receive special tax benefits, and built the NextEnergy Center, a 45,000 square foot research center and headquarters for MNEA.

In addition, the state government co-funds research programs at several of the state's public and private universities and colleges and has created Michigan SmartZones to attract clean technology companies.

The state is home to the US EPA's National Vehicle and Fuel Emission Laboratory.

- Public-Private – The state has collaborated with the US Department of Energy, DTE Energy, Lawrence Technological University, BP, and DaimlerChrysler to create the Michigan Hydrogen Technology Park. The Park will demonstrate several cutting-edge renewable-hydrogen technologies to fuel vehicles and power stationary fuel cells. The project budget is an estimated \$4 million.

The UPS Fuel Cell Vehicle Initiative is a public-private partnership building fueling stations and deploying vehicles in UPS fleet applications. This partnership is coordinated by the US EPA and includes DaimlerChrysler, Air Products, and UPS, and is based at the EPA's National Vehicle and Fuel Emission Laboratory in Ann Arbor. It marks the first time hydrogen vehicles are used in the normal business operations of a commercial fleet.

- University – The University of Michigan has several fuel cell vehicle research and development programs, including specific degrees in Hydrogen Technology and Fuel Cell Technology. U of M is also conducting research in crystalline and nanotube hydrogen storage technology.

Kettering University has partnered with the US Department of Energy, Michigan Commerce Department's Economic Development Administration, and the Delphi Corporation to establish a fuel cell research laboratory and house emerging technology companies. Kettering also conducts fuel cell system and powertrain integration research and receives substantial funding from the US Department of Commerce.

Other university programs in Michigan exist at Southwestern Michigan College, Michigan Tech's Institute of Materials Processing, and Lawrence Technical University.

Minnesota

- Government - House Bill 1495, introduced in March of 2005, would provide \$6 million in state funds for a Wind-to-Hydrogen Pilot Project.
- Public-Private - The Minnesota Renewable Hydrogen Initiative was created by the Minnesota Office of Environmental Assistance and private sector, and was

officially recognized by the legislature in 2003. Its goal is to lead efforts to grow and promote the state's hydrogen industry. It directs the Department of Employment to work with other state departments to develop programs to attract hydrogen-sector businesses.

- University - The University of Minnesota's Initiative for Renewable Energy and the Environment will receive over \$20 million over the next 5 years to support its hydrogen research and development programs.

Montana

Montana has quietly developed state-level support for a coordinated program to develop the state's hydrogen economy, and has attracted a significant amount of federal funds in support of this program. A draft blueprint plan has been published and facility-development is underway.

- Government - In 2003 the state legislature passed House Joint Resolution 26, "A joint resolution of the Senate and House of Representatives of the State of Montana supporting all necessary steps to move Montana into a hydrogen-based economy." The bill called for the creation of the Montana Hydrogen Futures Project, which will be administered by the University of Montana. The project has produced the *Montana Vision 2020* planning document, which identifies issues that need to be addressed to develop the state's hydrogen economy.
- University - Montana State University has programs conducting research into the production of hydrogen from proteins and ethanol-based sources. The University of Montana is managing the state's Hydrogen Futures Project. The University has received federal funds to begin developing the Hydrogen Futures Park at its Missoula campus' College of Technology, and is developing an Alternative Energy Learning Site at the Hellgate Canyon campus. This facility will integrate a wind-turbine with an electrolyzer, hydrogen storage, and a fuel cell.

Nevada

The City of Las Vegas is host to the world's first hydrogen-energy station, a facility that produces both power and hydrogen-fuel to serve the city's fleet. The state's university programs are also developed and well-funded.

- Business - Altain Nanotechnologies, Hydrogen Solar Production.
- Public-Private - Under a US DOE program, the City of Las Vegas partnered with Air Products and Plug Power to develop and demonstrate a full hydrogen-energy station that produces power and hydrogen-fuel. The station – which opened in 2002 - extracts hydrogen from natural gas, which is also dispensed onsite for the city's CNG vehicles. The city refuels its two Honda FCX at the site. Unused hydrogen is fed to a 50-kW stationary fuel cell and that power is fed to the city's electric grid.

The Washoe (Reno) Rapid Transit has received \$4 million to launch a hydrogen fuel cell bus project.

- University - The University of Nevada – Las Vegas' Research Foundation has received significant federal funding to partner with Proton Energy to construct an onsite solar-hydrogen fueling station at the Las Vegas Valley Water District. The program is part of a larger university program focused on the photo-electric

chemical production of hydrogen. UNLV also has a program conducting hydrogen internal combustion engine research.

The University of Nevada – Reno is also engaged in the research of photoelectrochemical production of hydrogen.

New Jersey

- University - In order to aggregate and demonstrate the work being conducted at several New Jersey colleges and universities, the New Jersey Hydrogen Learning Center was created by the New Jersey Center for Energy, Economic and Environmental Policy. The purpose of the facility is to ‘link hydrogen fuel cell research at Ramapo College, the College of New Jersey, Ocean County College, the Richard Stockton College of New Jersey and the Rutgers University EcoComplex.’

New Mexico

New Mexico is aggressively pursuing the rapid development of its state’s hydrogen economy. It has considerable public-sector backing and its business community has organized the New Mexico Hydrogen Business Council (NMHBC).

- Government - In 2003, the state’s Economic Development Department created the Hydrogen Technology Partnership (HyTeP) to promote the state’s alternative energy programs and business climate. It is composed of several state agencies, business interests, research laboratories, and universities/colleges. “HyTeP aims to create a cluster of research, engineering, development service, manufacturing, and business organizations that will make New Mexico the worldwide center for hydrogen and fuel cell development.” The program has received a consistent stream of state-funds, including a recent appropriation of \$1.1 million for FY2006.

In 2004, the state House passed the Advanced Energy Technologies Economic Development Act. This created a \$2 million fund to be used to create markets for advanced energy technologies in the state, including a focus on the hydrogen and fuel cell industries.

For 2005, Governor Bill Richardson has proposed the 2005 Clean Energy Legislation. This is a request for \$5 million for the Energy, Minerals and Natural Resources Department to bolster in-state hydrogen and fuel cell research and development through tax breaks, credits, and grants.

The House also endorsed House Memorial 29, which introduced the Hydrogen Energy Liability Insurance Program. This effort lays the groundwork for a state-run hydrogen liability insurance program for researchers and developers. The resolution was introduced by the NMHBC in preparation for legislation in the 2007 session.

- Public-Private - New Mexico Hydrogen Business Council
- University - New Mexico State University has fuel cell materials science research programs.

New York

New York has a few hydrogen stations installed to service a growing fleet of fuel cell and internal combustion hydrogen vehicles. The state government provides substantial amounts of funding for clean, alternative energy projects of which hydrogen is a sizeable component.

- Business - General Motors has chosen New York as the place to conduct its activities as part of the US DOE's Infrastructure Demonstration and Validation Project. GM has partnered with Shell Hydrogen on the project and will place 13 HydroGen 3 vehicles in the state.

Shell recently announced it has chosen Greenburgh as the site to convert a pump at an existing fueling station to dispense hydrogen. Shell and GM earlier had plans to conduct this project in Westchester, however, those plans were cancelled in February when community opposition to the site of the station forced the companies to relocate the project.

GM has one of its primary hydrogen and fuel cell development facilities in Honeoye Falls.

- Government - In 2004, Governor George Pataki allocated \$750,000 for the state to develop the New York Hydrogen Roadmap to guide the state's hydrogen research, development, and deployment efforts. Agencies included in the program are the New York State Energy Research and Development Authority (NYSERDA), Long Island Power Authority (LIPA), and the New York Power Authority (NYPA).

Following on this effort, the Governor announced that \$1.4 million would be used to place two hydrogen vehicles in demonstration fleets. NYSERDA has also provided funding for the development of a hydrogen fueling station in Albany to service 2 Honda FCX vehicles, and is funding the conversion and refueling of several internal combustion engine vehicles at the University of Buffalo. Project partners include Air Products, American Honda, American Wind & Hydrogen, Homeland Energy, Niagara Frontier Transit Authority, and Praxair.

The New York State Clean Cities Challenge is a fund that provides awards to members who procure alternative fuel vehicles and/or refueling infrastructures. The state's Clean-Fueled Bus Program grants funds to transit agencies, cities, or schools to fund up to the entire cost of a new alternative-fueled bus.

The Governor's 2007 budget includes substantial increases in funding for alternative energy projects, including hydrogen and fuel cell research and demonstration.

North Carolina

- Government - The state promotes its hydrogen economy through the Hydrogen Energy Action Team (HEAT), a volunteer-based advocacy group.
- Public-Private - In September of 2005, the North Carolina Fuel Cell Alliance launched the development of its *Hydrogen & Fuel Cell Roadmap*. The Roadmap will be "an industry-oriented technology-based economic development strategy..."
- University - Hydrogen and fuel cell research programs are being conducted at Appalachian State University's Energy Center, Duke University, North Carolina Agriculture & Technology, and North Carolina State University

North Dakota

North Dakota made news recently with the announcement of the development of a wind-to-hydrogen demonstration station.

- Government - In April of 2005, the legislature overwhelmingly approved the North Dakota Hydrogen Tax Exemption for all hydrogen produced and sold in-state for transportation purposes.
- Public-Private - Private sector contributors to UND's EERC project include: Air Products, Chippewa Valley Ethanol, Basin Electric Power Cooperative, ePower Synergies, Hydrogenics, IdaTech, Pratt & Whitney Rocketdyne, SGL Carbon, Schunk-INEX, Siemens, and Xcel Energy.
- University - The University of North Dakota's Energy & Environmental Research Center (EERC) recently received \$2.5 million from the North Dakota Centers for Excellence Commission to construct a new facility for its work as part of the US DOE's National Center for Hydrogen Technology. The Center will focus on the commercialization of hydrogen and fuel cells.

North Dakota State University has received funding from the US DOE and Basin Electric Power Cooperative to construct a Wind Hydrogen facility. The hydrogen-production facility is slated to open in the third quarter of 2006.

Ohio

As a national center of automotive manufacturing, Ohio has one of the country's largest hydrogen and fuel cell industries. This is bolstered by significant state backing, a public-private partnership, and well-established university research programs.

- Business - The state is the nation's 2nd largest automobile and fabricated metals producer, 3rd largest general manufacturer, and has a \$1.9 billion polymer industry.
- Government - In May of 2002, Governor Taft introduced the Ohio Department of Development's Fuel Cell Initiative. The program will receive \$103 million over a 3-year period. It is a component of the Governor's "Third Frontier Project", a 10-year \$1.1 billion economic development initiative based on technology expansion. To date the Initiative has disbursed over \$10 million in for project financing, research and development grants, and training programs.

The state is also home to the Batelle Institute, NASA, and the Air Force Research Laboratory, all of which are conducting hydrogen and/or fuel cell research.

- Public-Private - The Ohio Fuel Cell Coalition is composed of 39 companies, 11 universities, and 5 government entities. It is committed to identifying and collaborating on areas of coordination for the development of the state's fuel cell industry.
- University - Kettering University is the site of the state-sponsored Edison Materials Technology Center (EMTEC), which funds the research of new materials and manufacturing processes. It has programs focused on driving down the costs of materials and production of fuel cells and related technologies. Funding is provided in the form of grants.

Other university hydrogen and fuel cell research and development programs are hosted at Toledo, Case Western, Akron, Ohio State University, and Dayton.

Oklahoma

- Government - House Bill 2351 of 2004 created the Oklahoma Fuel Cell Initiative Task Force. The Task Force was instructed to assess the state's fuel cell industry and provide recommendations on steps the state should take to attract new businesses in that sector. It was also to look at ways to leverage existing infrastructure to develop the state's hydrogen economy. This 12-member panel was composed of various members of the legislature, agency heads, governor-appointed members of the public, university representatives, and representatives of the business community. Its work was commenced in September of 2005 and delivered its report to the legislature.

Oregon

- University - Oregon State University's Department of Bioengineering has received a \$900,000 grant from the US DOE to conduct research on the production of hydrogen from photosynthetic bacteria.

Pennsylvania

- Business - One of the nation's leading industrial suppliers of hydrogen, Air Products, is headquartered in Allentown. Media and Process Technology is based in Pittsburgh.
- Government - The 2005 US Congressional Transportation Bill allocated \$1.8 million to fund the Hydrogen-Shuttle Bus Demonstration Program. 2 Ford Hydrogen Internal Combustion Engine shuttle buses have been deployed in the state and will refuel at Air Products in Trexlertown.
- University - The University of Pittsburgh and Carnegie Mellon University both have hydrogen and fuel cell research programs, and Penn State University has created the Hydrogen Energy Research Center.

South Carolina

There is a concerted effort within the state to create a public-private partnership to leverage existing federal and university advancements in hydrogen and fuel cell research, and to make South Carolina the nation's research hub for those fields. Many press-releases describing this goal have been released recently, however, it is unclear what the state's intended path forward will be.

- Business - BMW and General Electric both conduct hydrogen/fuel cell research in the state.
- Public-Private - The state recently opened the Center for Hydrogen Research, a 60,000 square foot research and testing facility. Presently Savannah National Laboratory and Toyota are leasing space at the facility.

In January of 2006 the state Department of Commerce created the South Carolina Hydrogen and Fuel Cell Alliance. A non-profit corporation, the

Alliance's mission is to grow and promote the state's hydrogen and fuel cell research activities and industries.

- University - Clemson and the University of South Carolina have advanced hydrogen and fuel cell research programs in place. USC is home to the National Science Foundation's Center for Fuel Cell Research, and the school has spurred the development of three private-sector fuel cell startup companies: Palmetto Fuel Cell Analysis & Design, Palmetto Fuel Cell Technologies, and DEnergy. Clemson has received \$1.5 million in US DOE funds to conduct fuel cell membrane research.

Tennessee

- Government - Home to Oak Ridge National Laboratory
- University - The University of Tennessee has received federal funding to conduct research on fuel cell membranes.

Texas

- Government - In 2002, the Fuel Cell Initiative Advisory Committee delivered a report to the Texas State Energy Conservation Office detailing ways to commercialize fuel cells in the state. As a result of this effort the legislature approved the qualification of fuel cells for funding from the Texas Council of Environmental Technology, a pool of funding in excess of \$20 million.

Utah

- University - The University of Utah will received \$729,000 of \$1.5 million of a US DOE grant to perform computer modeling of fuel cell polymer membrane performance. Partnering with Clemson University on the project.

Vermont

- Public-Private - The state was awarded \$1 million by the US DOE to develop the first hydrogen-fueling station in New England. The station will use wind-powered electrolysis to produce hydrogen for a converted Toyota Prius. Project partners include: US DOE, Proton Energy, Burlington Electric, Northern Power Systems, and EVermont.

Washington

- University - The University of Washington has begun integrating fuel cell research programs into its undergraduate engineering course curriculum.

Washington D.C.

- Business - Shell Hydrogen and General Motors converted a pump at Shell's Benning Road fueling station to dispense hydrogen to fuel GM's fuel cell demonstration fleet.

Wyoming

- University - The University of Wyoming has received \$300,000 from the US DOE to fund a 3-year project to develop nanoscale catalysts for fuel cells.

Regional Initiatives

Initiatives that involve the coordination of multiple states

- FuelCellSouth – “FuelCellSouth was formed as an outgrowth of the collaborative work between industry and researchers in the Southeastern United States to identify and index the opportunities for collaboration in the delivery of fuel cell-based solutions in the commercial and consumer markets.”
- Mid-Atlantic Hydrogen Coalition – A regional public-private partnership designed to leverage the work of 6 Northeast states’ hydrogen activities and install a corridor of fueling stations along Interstate 95 from Boston to Washington DC.
- Upper Midwest Hydrogen Initiative - A regional public-private initiative to accelerate the commercialization and deployment of hydrogen facilities in Iowa, Wisconsin, Minnesota, North Dakota, South Dakota, and Manitoba, Canada. “The UMHI seeks to harness this region’s vast native hydrogen production potential from wind, biomass, hydro, solar and coal resources (with permanent sequestration of CO₂).”