



Hydrogen and Fuel Cells in South Carolina



In the South, we're known for our passions.

Sweet tea, football season, barbecue... Yeah, we're passionate about those. But hydrogen is quickly becoming the principal passion of South Carolinians.

South Carolina's long-standing base of hydrogen and fuel cell initiatives is uniting stakeholders from across our state to coordinate efforts and create the ideal environment for the deployment of hydrogen and fuel cell technology.

We are dedicated to supporting and growing the hydrogen fuel cell industry. Our multi-level governmental support, manufacturing expertise and existing R&D are uniquely positioned to bring hydrogen and fuel cell technologies out of the lab and into the lives of our citizens.

Multi-Level Support: From Local to National



On a national level, Rep. Bob Inglis (R-SC) and Sen. Lindsey Graham (R-SC) chair the House and Senate Hydrogen and Fuel Cell Caucuses, respectively. Rep. Inglis and Sen. Graham were both crucial supporters of the H-Prize, a bill which authorizes the federal government to give tens of millions of dollars to winners of a new prize aimed at speeding the development and widespread use of hydrogen cars.

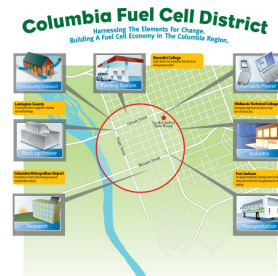
In state, Governor Mark Sanford identified hydrogen and fuel cell markets as a major cluster focus when he formed the South Carolina Competitiveness Initiative, which brings together government, business and academia to capitalize on our state's existing strengths.

In 2007, the SC State Legislature passed the Hydrogen Infrastructure Development Act which

established a fund providing a 25% tax credit to individuals looking to support the growth of hydrogen and fuel cell technologies. The Act also provides avenues for companies to pursue favorable state incentives in the aim of partnering with our state's existing research institutions and provides sales tax exemptions for equipment, machinery and building materials related to hydrogen and fuel cell research.

South Carolina's local communities have also shown strong support for hydrogen and fuel cells. In 2005, Aiken County fully funded the construction of the Center for Hydrogen Research, a \$10 million state-of-the-art facility designed to facilitate cooperative research among the Savannah River National Lab, universities and industry. The CHR is already growing with a \$1.7 million expansion in 2008.

South Carolina's cities are showing their support, as well. The City of Columbia, which unanimously passed a resolution supporting the city's objective to become a leader in fuel cell innovation, created the Columbia Fuel Cell District with the goal of becoming the model for the deployment of fuel cell technology.



Strength in Research: Well-to-Wheel

South Carolina's long-existing research and development strengths address every aspect of hydrogen and fuel cell technology.

South Carolina has at least a 50-year history of hydrogen research through the work at the Savannah River National Lab (SRNL). SRNL and the Center for Hydrogen Research continue to address hydrogen **production** and **storage** issues and recently debuted a 2007 Chevrolet Silverado 1500 fitted with a hydrogen internal combustion engine.



Our state's **automotive integration** assets are strong as well. Clemson University's International Center for Automotive Research (CU-ICAR) is quickly becoming the premier automotive research and education facility in the world. Strategic partnerships with companies such as BMW and Michelin will provide the platform with which to identify future automotive issues.

South Carolina State University's James E. Clyburn University Transportation Center (JECUTC) is also uniquely postured to address future needs in transportation. After completion, the \$26 million state-of-the-art facility will address key focus areas including the creation of a comprehensive hydrogen research capacity through collaborations in storage, production, fuel cells and environmental studies, among other areas.

Additionally, the University of South Carolina continues to be a nationally recognized leader in **fuel cell research** through its NSF Industry/University Cooperative Research Center for Fuel Cells. A new Center of Excellence for high temperature fuel cells is using multiphysics analysis to design materials at the nano-level and working on high temperature electrolysis with NASA and SRNL.



South Carolina's location also makes it a prime location to investigate **renewable** hydrogen production. Our state is poised to capitalize on hydrogen production from offshore wind energy and biomass given our state's long agricultural history.

SC's Hydrogen Markets:
Not your traditional wheels

In South Carolina, we're addressing near-term applications that will create a feasible impact on our citizens. Portable applications such as television cameras, battery packs and forklifts have all been deployed in our state and offer the opportunity to enhance products already on the market. University of South Carolina professors recently enhanced a Segway personal transport that operates for approximately 4 hours on a battery charge to operate for more than 8 hours with a supplemental hydrogen fuel cell.

These and other technologies have been deployed across our state to create a practical foundation on which to build the hydrogen economy.

Manufacturing Prowess:
Expertise with a workforce to match

Our state offers the perfect site for manufacturing hydrogen and fuel cell technologies with a statewide network of resources, including abundant, low-cost industrial facilities, infrastructure resources and a superior transportation network allowing any company a true competitive advantage. South Carolina has more than 50 statutes which provide financial advantages to manufacturing in our state.

And with every hydrogen car placed on our roads and with every forklift fitted to run on hydrogen, we must create and build an educated workforce to service and maintain these innovations. A number of projects are already under way in South Carolina's public schools, technical colleges and universities that are educating and training students of the benefits of hydrogen technologies.

The South Carolina Hydrogen and Fuel Cell Alliance



The SCHFCA is a nonprofit collaboration for cooperative and coordinated utilization of resources in the state used to advance the commercialization of hydrogen and fuel cell technologies. Founded in January 2006, the Alliance was created by six core institutions and organizations devoted to hydrogen and fuel cell initiatives:

- The Center for Hydrogen Research
- Clemson University
- Savannah River National Lab
- SC Department of Commerce
- South Carolina State University
- The University of South Carolina

Please plan on joining us in 2009 as we host the National Hydrogen Association's 20th Annual Conference at the Columbia Metropolitan Convention Center.

For more information on the SCHFCA, please visit www.schydrogen.org.