

PATH and Local Cooperation: Think Globally & Act Locally

By Jay Laskin, Hyenergy Consulting, LLC, U.S. representative to PATH

The U.S. Department of Energy (DOE) has stated "The mission of the Hydrogen, Fuel Cells & Infrastructure Technologies Program is to research, develop, and validate fuel cells and hydrogen production, delivery, and storage technologies for transportation and stationary applications. The objectives of the program are to:

- Dramatically reduce dependence on foreign oil
- Promote the use of diverse, domestic, and sustainable energy resources
- Reduce carbon emissions from energy production and consumption
- Increase the reliability and efficiency of electricity generation

The DOE's Mid-Atlantic Regional Office has been active in supporting these goals and is promoting the Mid-Atlantic Region as part of a "northeastern corridor."

The northeastern region of the United States is a densely populated, highly mobile area of the country. A major transportation route (interstate 95) extends from north of Boston to South Florida and presents a unique opportunity to further advance the progression toward a hydrogen economy.

The Mid-Atlantic Region of the United States is comprised of 6 states (New Jersey, Pennsylvania, Delaware, Maryland, West Virginia and Virginia) plus the District of Columbia. The interstate 95 highway is a major artery through it.

Among the advantages of this region are the opportunities to educate a large section of the population, to facilitate development and adoption of Codes and Standards among several independent states, to facilitate partnerships and to demonstrate infrastructure changes.

Because of the population and the traffic along the interstate highway system, the DOE, along with various states and other organizations are working on educational demonstration sites that will expose many people to the virtues of hydrogen. Additionally, because of the interconnection of the highway system, it acts as a common point for getting the states and municipalities to work together in learning about and adopting coherent hydrogen codes and standards.

There are over 30 non-governmental organizations actively working on various hydrogen and fuel cell projects within the region. Some of them are listed as follows:

Delaware

Dupont
Ion Power

District of Columbia

Breakthrough Technologies
National Hydrogen Association

U.S. Fuel Cell Council

Maryland

Pennsylvania

Air Products and Chemicals, Inc.
Power and Energy, Inc.
Penn State University
University of Penn
Johnson Matthey
Atofina
CTC

Rohm Haas

Virginia

DTI

Johns Hopkins University
Energetics
Sentech
W.L. Gore
Mid-Atlantic Hydrogen Coalition
Teledyne Energy Systems< Inc.
QSS Group

Virginia Tech
CSMI
H2Gen

West Virginia
National Energy Technology Lab

New Jersey

DeNora
Engelhard Corporation
Princeton University
Millennium Cell

Rutgers University

Many of these organizations are already working together and will form strong partnerships in the future.

With this concentrated interest, projects are already progressing, both independently and under the support of the DOE. Some of them are described below:

Penn State University Hydrogen Refueling Station:

- The principal objective of an ongoing project by Air Products Chemicals Incorporated and the DOE is to develop and demonstrate a comprehensive hydrogen fueling station that can competitively deliver a hydrogen product stream for the emerging hydrogen-in-transportation markets. This station will be located and operated at the Pennsylvania State University in University Park, PA and managed by the Pennsylvania Transportation Institute (PTI).

"A Novel Low Cost Membrane for Recovery of Hydrogen from Fuel Cell Reformates"

- Power & Energy, Inc. (P&E), under contract to the Department of Defense's Defense Advanced Research Projects Agency (DARPA), will manufacture high efficiency palladium (Pd) alloy thin film membranes using its patent-pending technology. This new membrane, based on thin film nano-structures, will enable fuel cell users to cost-effectively generate high purity hydrogen-on-demand from any reformed fuel source. Given its low cost, compact size and passive operation, this membrane technology is ideal for early adoption of fuel cells in remote, portable and mobile applications that are not amenable to other, more complex hydrogen separation methods.

Shell/GM Hydrogen Partnership, Washington DC

- Under a joint program with the DOE, Shell Hydrogen & GM will demonstrate fleet vehicles and infrastructure features within the "corridor."

The project will consist of the following features:

- Real-life demonstration of hydrogen fuel cell vehicles and fueling infrastructure technology

- The nation's first hydrogen pump at a Shell retail gas station to support a GM fleet of fuel cell vehicles
- GM and Shell will provide an entire system – from the generation and distribution of hydrogen to a retail station, and the storage of hydrogen on a vehicle to the actual vehicle itself.

Mid-Atlantic Hydrogen Technology Education Center (H2TEC), VA

With Virginia Polytechnic Institute and State University (Alexandria Research Institute) acting as the project lead and the University of Maryland at College Park, Breakthrough Technologies Institute and Hampton Roads Clean Cities Coalition participating, a multi-year project will establish a new undergraduate course in hydrogen technology and expand graduate study in the hydrogen area.

Short courses and seminars for professionals will be offered and presentations for non-technical audiences will be developed. K-12 outreach projects are also included.

Post Office to test Hydrogen powered vans, VA:

In September the US Postal Service began a two-year test of a single hydrogen-powered mini-van that will be used to deliver mail. Carriers will use a GM fuel cell vehicle to deliver mail three days per week. The Postal Service's test is the first commercial use of a hydrogen-powered car in the Mid-Atlantic region.

Concurrent Technologies Corporation (CTC) Hydrogen Regional Infrastructure Program, PA

The purpose of the program is to support the DOE's objective of developing cost-effective and energy efficient hydrogen infrastructure for transportation and stationary power. The program will focus on, delivery, new material development and hydrogen sensor development.

The northeastern area of the U.S. as well as California and other regions has many unique characteristics that make it attractive for future development efforts for the hydrogen economy. These coalitions are an attempt to facilitate cooperative work at a local level. Likewise, PATH is an effort to forge relationships on an international level. We think both are important and needed for a successful venture into the future world energy scenario.