

Comments concerning "State Policy for Hydrogen", Legisbrief Vol. 12, No. 42, October 2004.

The vehicles that carry people and goods on the nation's roads run on a well-refined but relatively old technology and fuel: internal combustion engines operating on gasoline or diesel. As it becomes clear that long-term supplies of oil are diminishing, many policymakers have begun to seriously consider new ways to power cars, trucks and buses.

There are many examples of decades old technology that could, if implemented, greatly improve the efficiency of fossil-fuelled engines. A Shell Oil book, "Fuel Economy of the Gasoline Engine" (ISBN 0-470-99132-1) addresses some of this technology. Shell Oil, in 1973, achieved 376-mpg with a modified production vehicle.

Hydrogen and hydrogen fuel cells may hold promise as ways to reduce vehicle emissions and reduce the nation's reliance on imported oil. Hydrogen technology is developing fast and shows a great deal of promise, but the day when hydrogen vehicles ply the streets of America is at least a decade away and even longer than that before the vehicles become commonplace.

There are many patents for decomposing water for use as fuel, in 1921 patent 1,380,183 was granted. In 2005, BMW will offer for sale, model 745H, a dual, gasoline/hydrogen fuelled automobile. This site, <http://www.bmwworld.com/models/745h.htm> has information. Additional information may be found at <http://fuelcellsworks.com/Suppage68.html>.

The North American hydrogen industry is heavily focused on research and development. A Price Waterhouse Coopers survey found that, although research and development expenditures were increasing (by close to 20 percent between 2001 and 2002), fuel cell companies still were unprofitable. Their heavy investments in research and development far outweigh their revenues from a relatively small number of demonstration projects and early adopters of fuel cell technology. The industry itself is focused heavily on the long, not the short term.

Much research and development has already been accomplished on fuel cells. In the New York Times, for November 21, 2004, there is a full-page advertisement by General Motors telling of their 40-years research in fuel cells. One company, <http://www.ballard.com/>, has demonstrated fuel cell powered vehicles for years. Additional companies with fuel cell devices may be found at <http://fuelcellsworks.com>. There is a patent, 6,113,748, for Aqua Fuel that extracts, from any water, a fuel gas that is 46.4% hydrogen.

In general, state policy for hydrogen falls into four areas:

- Address barriers to hydrogen (develop hydrogen policies while the technology develops).
- Create a hospitable policy climate for hydrogen.
- Fund outreach and development.
- Provide tax incentives (although these may not be feasible in today's difficult budget times).

No comment.

Barriers to Hydrogen. Hydrogen faces a number of barriers aside from the technical challenges. Hydrogen requires a physical infrastructure of pipes and storage. It currently costs much more than the conventional infrastructure for gasoline. It also faces a set of institutional barriers; most codes and standards regulate a world of liquid—not gaseous—fuels, such as gasoline or diesel. State policy can begin to address codes and standards, in combination with local policy. Building codes that regulate repair facilities and vehicle garages, fire codes, and codes that regulate bridges and tunnels are three areas that will pose obstacles to hydrogen use.

We have distribution systems in place for natural gas. It is estimated, <http://www.ocees.com/mainpages/Distribution.html>, a hydrogen distribution system would cost 50% more than natural gas. This seems a small price to pay for fuel that can be extracted from water.

<http://www.praxair.com/Praxair.nsf/0/D09378C1833FD8E1852568FE00717B5E?OpenDocument> is one map of hydrogen distribution facilities. An Internet search will disclose other distribution facilities. This month, November 2004, a Washington, D.C. TV station told of a hydrogen filling station opening in that city.

A Hospitable Climate. Hydrogen technology will flourish best in an atmosphere that places a value on energy security, air quality, power reliability and fuel diversity. States that take a leadership role in these policies are most likely to be leaders themselves in hydrogen technology. If hydrogen technology fulfills its promise, then these states also will be able to take advantage of some of the economic development benefits. Some states already have taken a leadership role. Minnesota law states that "...it is the goal of the state that Minnesota move to hydrogen as an increasing source of energy for its electric power, heating and transportation needs."

No comment.

University Research and Development. State policy can support university research and development. Minnesota already does so. Hawaii appropriated \$200,000 to research and development. States provide funding in a number of ways, including the system benefit charge (a fee on electricity bills that all customers pay) and through university funding channels.

Why must the consumer pay for research and development for devices patented decades ago? The function of government is to act in the interest of the people, taxing for existing technology is not good government.

Tax Incentives. Many states define certain fuels as "clean." These fuels often qualify for tax incentives, grants, loans or other special treatment. New York defines hydrogen fuel cells as clean and allows them to qualify for credit under the state's Low Emission Vehicle Program. Missouri exempts hydrogen fuel cell vehicles from emissions testing. Minnesota defines hydrogen as a clean fuel, qualifying it for certain grants. Although hydrogen fuel cell vehicles will not be on the road for some time, such legislation can help raise awareness of the technology.

Hydrogen fuel cell technology has been on the road for some time, <http://www.ballard.com/>, <http://fuelcellworks.com> and <http://www.bmwworld.com/models/745h.htm> has information.

State Action

State agencies often are reluctant to exceed statutory authority without specific direction from the legislature. Or they are much more likely to begin work in new areas if the legislature has given them specific directions. Michigan's Legislature directed the state Department of Transportation to work with other agencies and private companies on fuel cells and advanced technology transportation. Minnesota's statutes now direct the economic development office to attract fuel cell companies to the state.

No Comment.

New technologies can benefit from well-designed incentives. States can offer sales and property tax exemptions, research and development incentives, and other measures. Idaho, Maryland, Nevada, Vermont and Washington offer a sales tax exemption on hydrogen as a vehicle fuel. In the near term, these incentives are unlikely to cost the state very much because very few vehicles will operate on hydrogen. These exemptions are part of a larger strategy to develop a hospitable policy climate for hydrogen. A state also can offer fuel cell companies tax incentives for locating an office or facility in the state, leading to economic development opportunities. State vehicle and some private fleets may successfully house small-scale vehicle demonstration units. Such demonstrations can experiment not only with the vehicles themselves but also with the necessary infrastructure—fueling, storage, repair and other components—of running a vehicle fleet. States could offer grants for fleet fueling stations.

Another proposal for giving taxpayers money away. Hydrogen technology has existed for decades.

Hydrogen is a technology that requires a long-term vision. It may—or may not—be part of a solution to the nation's long-term energy problems. The challenge is to develop long-term strategies in a political atmosphere that, by necessity, devotes resources to short-term problems.

Hydrogen is not the only technology for solving the nation's energy problems. My site, byronw.www1host.com, has over 100 documents relating to energy. An Internet search will locate many other sites relating to energy solutions that our government chooses to ignore.

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