



Hydrogen fuel adherents see 2020 as key year

Reuters

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LONG BEACH, California (Reuters) - Hydrogen fuel proponents see 2020 as the year it all comes together.

Not only will there be affordable zero-emissions hydrogen-fueled cars in every showroom but in 2020 a smattering of houses across the world will be lighted with electricity from hydrogen-powered home generators.

So say the researchers, business people and government officials working to take hydrogen from an expensive experiment to an affordable alternative to petroleum and its polluting products, gasoline and diesel fuel.

But to the average person, hydrogen seems closer to science fiction than a reality show.

Even proponents agree there are four major hurdles researchers need to solve before the fuel can be used widely: storage, fuel cell durability, affordability and a delivery system, which some call "wells to wheels."

Consumers also have not shown any ability to break the petroleum habit, which frustrates Alan Lloyd, secretary of the California Environmental Protection Agency.

"It's disturbing there has been no major uprising against the cost of oil. People are not driving less," Lloyd said in a speech to some of the 1,100 attendees at this week's National Hydrogen Association annual conference at the Long Beach Convention Center.

Average U.S. gasoline prices have gone from \$1.45 per gallon to \$2.37 per gallon since President George W. Bush extolled hydrogen energy in his 2003

State of the Union address. In that time, U.S. gasoline consumption has risen 6 percent.

Bush's proposed 2007 hydrogen energy development budget of \$289 million is half the spending authorized by Congress in last year's sweeping energy bill, NHA officials said. That's up from 2001 federal funding of \$73 million.

But widespread use of odorless, colorless hydrogen will remain a dream unless researchers make technological breakthroughs that the hydrogen business community, which is still small, banks on. Companies from one-person shops to Chevron Corp. and General Motors Corp. are investing, but precious few turn profits now. Most automakers and oil companies and many utilities are developing hydrogen programs.

By 2010, major automakers expect to have most of the technical aspects solved on their experimental models, but it will take until 2020 or so before mass manufacturing allows affordable cars.

"There is every reason to believe this is a technology that will come down in price with automated manufacturing," said Jeffrey Serfass, president of the National Hydrogen Association.

The prototype hydrogen-fueled cars, which number only several hundred worldwide, can cost \$1 million or more. Most of average size can store about 3 kilograms of pressurized hydrogen gas which can go about 125 to 175 miles under normal conditions before refueling.

"Hydrogen storage is the No. 1 problem," said Steven Chalk, manager of the hydrogen and fuel cells program for the U.S. Department of Energy.

Dave Barthmuss of GM said the first fuel cell car was made in 1964 as an experiment using a 1965 Corvair, but fuel cells took up most of the car.

Someone needs to find a way to pressurize hydrogen so more of it can fit into a car-sized gasoline tank, which would enable cars to travel 300 to 350 miles between fill-ups.

Chalk said pressurizing hydrogen may only be a bridge until researchers can store it as a solid in a metal, such as magnesium.

Chalk said such alternative storage solutions would be necessary, since high-pressure gas tanks had limited use.

Jeff Serfass has been president of the NHA since it formed 17 years ago, and he is still optimistic.

"Today, people see the hydrogen economy as both logical and probably inevitable," he said.