GM says its future is in fuel cells

Will internal combustion go the way of the horse and buggy?

By Martin Wolk

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June 12 - With gasoline prices again nearing $2 a gallon, the auto industry has come under growing pressure to produce cleaner, more fuel-efficient vehicles. But General Motors sees a future in which the century-old internal-combustion engine is abandoned entirely in favor of cars and trucks powered by hydrogen-based electric fuel cells.

IN ITS LATEST STEP toward realizing that distant vision, the No. 1 automaker Tuesday said it will make a "substantial" investment in a California company that has come up with a way to double or triple the effective cruising range of a fuel cell-powered vehicle to 500 miles.

GM did not provide financial details but said it would take a 20 percent stake in Quantum Technologies of Irvine, Calif., which focuses on storage solutions for alternative energy power.

"This agreement will enable our two companies to work together on bringing fuel cell vehicles to the market," said Larry Burns, GM vice president for research and development and planning. "It is a logical next step on the long road to a hydrogen-based economy."

Shares of Impco Technologies, the parent company of Quantum, rose $2.80 to $39.82 on the news.

TANK BREAKTHROUGH

Burns said GM decided to invest in Quantum partly because of the company's breakthrough in developing a tank capable of carrying hydrogen aboard a car or truck under the extremely high pressure of 10,000 pounds per square inch, four times the current standard. The increase would translate to a cruising range of 300 to 500 miles without refueling, compared with 100 or 150 miles under the current standard.

"In terms of hydrogen storage, getting up into this kind of range is really the holy grail we were looking for, so it's pretty exciting," Burns said at a news conference to announce the stepped-up partnership.

Fuel cells, which use hydrogen fuel to continuously produce a stream of current to an electric motor, are considered one of the most exciting technologies for powering advanced vehicles because water is the only emission and hydrogen is readily available for extraction rom existing fuels or water.

Unfortunately, the issue of on-board hydrogen storage is far from the only major hurdle standing in the way of a future in which millions of fuel cell-powered vehicles quietly prowl the roads.

First proponents of the technology have to figure out a way to get hydrogen to the masses in a world whose infrastrucutre is set up for dependence on gasoline and other petroleum-based fuels.

GM and other automakers hope to solve the problem by developing cars with devices that create hydrogen on board as it is needed … using gasoline as a fuel. The vehicles still would have very low emissions because the gasoline would be transformed chemically with no combustion, and the electric engines would be rougly twice as efficient as current internal-combustion models, GM officials said.

Burns said GM is working with oil companies on a new gasoline formula that would be more suitable for extracting hydrogen. He said that would be a better solution than proposed alternative fuels like methanol, which is more toxic than gasoline, though it reduces emissions.

A second transition step would involve transforming gasoline into hydrogen at the service station level and storing it on board, eliminating the need for a "reforming" system on every vehicle. Finally, Burns sees a world where hydrogen is created in mass quantities through electrolysis from sea water.

"A NATURAL EVOLUTION"

All that is years if not decades in the future. For now, GM has committed to putting a working proptotype vehicle on the road by March 2002, and a spokesman said the company very well could do it sooner. Burns said that by 2010 he expects "hundreds of thousands" of vehicles on the road powered by hydrogen fuel cells, mostly buses or other fleet-purchased vehicles rather than individual passenger cars. That's just a tiny fraction of the 56 million new vehicles that roll off the world's assembly lines each year, but Burns and other GM officials believe that fuel cell-powered vehicles ultimately will come to dominate the roads.

"We see that as a natural evolution," said Pete Barkey, a spokesman for GM, who added that gasoline and electric-powered vehicles would co-exist on the roads "for quite some time." As to when fuel cells would become the dominant power train for automobiles, Barkey said, "I wouldn't even dare to put a decade on that."

GM said it planned another major announcement on fuel cell technology Wednesday but declined to provide details.

Christine Farkas, an analyst at Merrill Lynch, said in a note to clients that the GM announcements "(add) credibility to the fuel cell industry, and especially to the fuel cell vehicle industry, as many auto makers will need to be involved for this to be a mass market."

Remember the electric car? General Motors invested more than $1 billion in the Earth-friendly EV1 but managed to lease only 800 before shutting down the entire program - because, in part, people had too few places to plug in the cars. Now the cash-strapped carmaker has placed another billion-dollar bet, this time on hydrogen fuel cells, with plans to double its financial commitment over the next five years. GM expects to roll out a practical hydrogen-powered ride by 2010, but outside experts say the technology for an H2-fueled economy is decades off. Meanwhile, Toyota has taken the lead in eco-autos with its hugely successful Prius, and industry rumor has it that GM could license Toyota's hybrid tech to make up lost ground. We asked Larry Burns, GM's vice president of R&D and strategic planning, if the company is spinning its wheels on hydrogen.

***Wired*: Gas-electric hybrids are the automotive industry's biggest success story in years. So why is GM betting the farm on hydrogen?**
Burns: I wouldn't call it betting the farm. The fuel cell and hydrogen program is the largest in my budget, but you have to look at it as our long-term play. Are we making a big bet? Yes. Is it an important bet? Yes. Is it our only bet? No. Are we spending like drunken sailors to the point that we wouldn't be able to do anything else if this doesn't pan out? No, not at all.

But you still have to catch up to Toyota.
What long-term problem have we fixed with the miracle of a hybrid? If you woke up tomorrow and all 220 million cars and trucks in the United States had been hybridized to the degree that the Prius has - all getting 25 percent better fuel economy - in six years we would be consuming the same amount of petroleum that we are right now. Fuel cells create a better automobile that's 50 percent more energy-efficient overall and sustainable from energy and safety perspectives. We're going to compete for customers by having good hybrids, but these vehicles account for less than 1 percent of US auto sales. I admire what Toyota has done, but at the end of the day, what problems are we trying to fix here?

So can I assume GM's hybrid cars, like Ford's, will be part of a deal with Toyota?
No, you can't assume that at all. The tech�nology we're coming out with in 2007 is our own. We do not have a collaboration with Toyota on hybrids.

Many scientists say it will take decades to develop fuel cells and the infrastructure to support them. What do you know that they don't?
The first question I'd like to ask them is, when was the last time you were in a state-of-the-art fuel cell-development laboratory? I work with a tremendous team of scientists and engineers who are creating that capability, and my confidence in our 2010 timetable grows every week.

But we still have to burn fossil fuels to get hydrogen. What's the point of a hydrogen economy if it's powered by carbon?
I don't believe that a hydrogen economy depends on a carbon economy at all. Do you know how many nuclear reactors China will be implementing over the next 20 years? Quite honestly, being in the car business, I don't care whether the hydrogen comes from wind, geothermal, nuclear, solar, or �fossil. What I care about is that each local economy plays to its strength. You get 5 percent from here and 10 percent from there, and suddenly you've created a trans�portation energy market with a number of pathways competing, as opposed to just a petroleum pathway.

OK, but you have to admit it's tough to take all this seriously from the company that makes Hummers.
Yes, we do develop and sell Hummers. We're also offering Americans more high-efficiency, high-volume-potential vehicles than any other manufacturer. We're in the business of building cars that people want to buy. The question I have for environmentalists is, Why do some of them come across as anti-hydrogen? What's so threatening about a solution that removes the automobile from the environmental debate?

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