

Moving Beyond Gasoline

UTILITIES STUDY IMPACT // BY WILLIAM OPALKA

IF THE UNITED STATES IS SERIOUS ABOUT lessening its dependence on foreign oil for surface transportation – gas for cars, really – there appear to be three options available to change over from what's been the fuel of choice for more than a century.

Fuel cell vehicles are still probably a couple of decades away from affordable mass production, even though Honda recently took the small step of starting to roll out its new Clarity model in California over the next three years.

And natural gas-powered vehicles, a technology that has existed for decades and has been used in Europe, has been getting more play of late, primarily due to its central role in the Pickens plan. But there doesn't seem to be a groundswell of interest, nor the infrastructure needed to support it, and auto manufacturers seem to be even further behind in popularizing it than the other alternatives.

One technology available now and that is closer to being used on a mass scale more quickly is plug-in hybrid electric vehicles, or PHEVs. Although they are mostly available through conversions of existing hybrids such as Toyota Priuses and Ford Escapes, at perhaps \$10,000 a pop, several automakers are planning to roll out mass-produced PHEVs in the 2010 model year.

Fuel cell cars are just now becoming available in miniscule numbers, too small to have a meaningful effect for several years. Honda touts the Clarity's environmental benefits, primarily its discharge of water vapor. It has a range of about 280 miles before refueling at a hydrogen station. Honda is leasing about 300 vehicles over the next three years at \$600 per month. But according to a study by the Argonne National Labs, it will cost twice as much to refuel as gasoline at the pump and require installation of an infrastructure costing half a trillion dollars.

The Pickens plan, with its proposed switchover from gasoline-powered autos to those that run on natural gas, is problematic. Even if we started now, the construction of wind farms, the transmission lines to move that electricity to market, conversion of motor vehicles to natural gas and the infrastructure need to support them, would be a massive undertaking that would take years and hundreds of billions of dollars.

But what would this mean to utilities that are

already facing nightmarish projections of demands on their capacity, even without the addition of millions of vehicles to their load? The demand for energy is expected to grow 30 percent by the year 2030 and the United States will need to build 151 gigawatts of new generation by that time, according to the Brattle Group that performed a study for the Edison Electric Institute.

Toyota so far has committed only to producing 400 PHEVs for fleet evaluation during or before 2010. The Saturn Vue plug-in hybrid is also expected to be one of the first commercially available PHEVs.

Last summer, in a speech before the Detroit Economic Club, Michael Morris, chairman and CEO of American Electric Power, said he believes that the U.S. electrical grid could now support as many as 60 million PHEVs. Morris said that PHEVs would help improve load balancing on the grid if they are plugged in during off-peak hours.

The Edison Electric Institute is bullish on PHEVs and doesn't see a danger in overbuilding to accommodate this demand. "We believe there is going to be a 30 percent growth in demand over the next 20 years, and any adoption of plug-ins will be gradual, so the infrastructure will be able to absorb them," said EEI spokesman Ed Legge. In fact, EEI sees the added benefit of load balancing from PVs, particularly if they are recharged at night when larger quantities of wind energy are available and integrated into the grid.

The Electric Power Research Institute and the Natural Resources Defense Council in a recent report said that a 60 percent U.S. market share for PHEVs would use 7 percent to 8 percent of grid-supplied electricity in 2050. ☐

