Challenges to grow with electric cars' sales: Aging grid needs to handle more power

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President Barack Obama and others are calling for a boom in electric vehicle production, which seems simple enough on the surface: Build the cars and plug them in. If only it were that easy.

When a Chevrolet Volt is plugged into a 240-volt outlet, it will use about 3.3 kilowatts of power, or about the same amount of power as a dishwasher or air conditioner.

Most people are already familiar with what can happen when thousands of air conditioners are plugged in and running at the same time during the summer: brownouts.

"The last thing we would want is for everyone to come home ... and plug them in at 5 or 6 o'clock on a hot, muggy summer afternoon ... when we are at our peak," DTE Energy Chairman Anthony Earley Jr. told the Free Press in an interview recently.

And then there are other challenges: What happens on road trips when drivers need to recharge the battery? What if you live in an apartment without a garage and electrical outlets?

As electric vehicles grow in popularity, so do the challenges.

Vince Dow, DTE's vice president of distribution operations, said it could take "maybe a decade" until there are enough plug-in cars on the road to cause problems with the national power grid.

However, it also takes about that long, experts say, to plan and build a new power plant.

That's why experts like Earley, who recently joined the board of Ford Motor Co., say the nation must start working to address infrastructure concerns now.

The slow ramp-up of electric cars will help the country prepare.

Mike Omotoso, a senior manager and hybrid expert at J.D. Power and Associates, said major automakers have plans to produce fewer than 100,000 electric cars for the U.S. market through 2011.

Over the next two years, GM plans to build 40,000 Chevrolet Volts, Toyota Motor Corp. intends to produce more than 15,000 plug-in Prius cars, Nissan intends to produce 10,000 yet-to-be named electric cars and Chrysler intends to produce 5,000.

With those low numbers, electric vehicles will likely represent less than 1 percent of the 10 million or so vehicles sold a year in the United States for some time.

The numbers of consumers opting for electric cars, however, is likely to grow faster as gas prices rise.

One of the key challenges is getting the nation's aging power grid ready to handle the additional power needed to recharge thousands of new cars and trucks.

Since 1990, demand on the nation's electric system has increased by about 25 percent, according to the U.S. Department of Energy. The nation operates about 10,000 power plants. However, construction of the transmission infrastructure that distributes that electricity has decreased about 30 percent since 1990.

"Unless substantial amounts of capital are invested over the next several decades ... service quality will degrade and costs will go up," the Department of Energy says on its Web site.

One of the core ideas emerging as a solution to manage electric demand for future electric cars is getting people to recharge their electric vehicles late at night, an off-peak time.

To encourage people to recharge their electric vehicles at night, utilities are installing smart meters, which will show how much it costs to recharge at different times of the day and encourage customers to better manage their consumption. Nighttime rates will likely be the lowest.

Last year, DTE launched a smart-meter test project on Grosse Ile, Mich. The utility is working with partners to install 30,000 new meters on the island, with plans to spend $350 million installing the meters statewide.

But even with the right technology, Joe Hoagland, a vice president at the Tennessee Valley Authority, a utility, still sees potential problems.

"The recharging concept at night is OK, but the range of a strictly electric vehicle is still limiting enough that in a given day you may need to travel more than you can do with a single charge," Hoagland said.

Ultimately, the nation will need a system of public recharging stations similar to the Web of gas stations nationwide.

Venture capital-funded Project Better Place, Itron Inc. and GridPoint Inc. are some of the firms working to build that network and explore different technologies for electric metering and recharging.

"I think you are going to see a booming cottage industry of parking garages offering charging stations," Dow said.

The key, said Ann Marie Sastry, a University of Michigan battery expert, is for the government to establish easy permitting and approval processes, as well as tax incentives, to encourage development.

"To me, it would be great to see new companies move in with innovative ideas ... and create wealth," Sastry said. "But the government has to be a partner in that."

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ADDITIONAL FACTS

GRAND AMBITIONS

When President Barack Obama laid out his new energy plan for America -- standing in front of about 1,000 supporters last August -- it included

ambitious automotive goals. Among them:

• One million plug-in hybrid-electric cars on the road by 2015.

• A 10-year, $150-billion plan to develop alternative and clean energy sources, including fuel cells to power vehicles.

"I know how much the auto industry and the autoworkers of this state have struggled over the last decade or so," Obama said at the time. "But I also know where I want the fuel-efficient cars of tomorrow to be built -- not in Japan, not in China, but right here in the United States of America. Right here in the state of Michigan."

While automakers have at least 70,000 electric cars slated for production for the United States through 2011, a Morgan Stanley report last year estimated that annual U.S. sales of both hybrid gasoline-electric and plug-in hybrid electric vehicles could reach about 1.2 million in 2015.

However, that report assumes higher gas prices of $3 a gallon, which are a strong driver for alternative-vehicle sales.

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