

Costs of plug-in cars key to broad consumer acceptance

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A University of Michigan survey released today shows widespread consumer interest in buying plug-in hybrid electric vehicles (PHEVs). But the cost of the cars is much more influential than environmental and other non-economic factors as a predictor of purchase probabilities.

The survey of a nationally representative sample of 2,513 adults age 18 and over was conducted between July and November 2008 as part of the Reuters/University of Michigan Surveys of Consumers. The findings were released at The Business of Plugging In: A Plug-In Electric Vehicle Conference in Detroit.

"The data provide strong evidence that a combination of economic and social incentives may be most effective in successfully introducing these vehicles," said economist Richard Curtin, director of the Reuters/University of Michigan Surveys of Consumers, conducted by the U-M Institute for Social Research.

The study was supported by funds from the Pacific Northwest National Laboratory and the U-M Transportation Research Institute. In addition to assessing the current state of knowledge and opinions about PHEVs, the survey addressed the willingness to pay for these vehicles given different cost and fuel savings scenarios.

Overall, when given no cost or fuel-saving estimates, 42 percent of those surveyed said there was at least some chance that they would buy a PHEV sometime in the future.

The researchers then asked respondents to rate the likelihood of purchasing a PHEV under three different cost-scenarios, each time assuming they would save 75 percent in fuel costs compared to a traditional, gasoline-powered vehicle. With each successive doubling of the price of PHEVs, the probability of purchase fell by 16 percentage points.

On average, 46 percent of those surveyed said there was some chance they would purchase a PHEV that cost \$2,500 more than a traditional vehicle; 30 percent said there was a chance they would buy if the PHEV cost \$5,000 more; but just 14 percent said there was a chance if it cost an additional \$10,000.

The relationship between cost and purchase probabilities was clearly indicated by the proportions who said there was zero chance of buying or 100 percent chance of buying at the three different cost premiums presented in the survey.

"Indeed, 56 percent of all consumers responded that there was no chance that they would buy a PHEV at the top premium," Curtin said. "The proportion indicating a zero probability of purchase moves from nearly one-in-four at \$2,500, to one in three at \$5,000, to more than one in two at an added cost of \$10,000. At the other extreme, those who said they were 100 percent certain that they would buy a PHEV reached a high of just 10 percent for the lowest added cost and fell to just 1 percent for the highest added cost."

It should be no surprise that vehicle purchases, typically the second largest purchase households make, would be very sensitive to price, Curtin says. But although consumer acceptance of PHEVs was not determined solely by cost issues, the role of environmental considerations played a smaller role in consumer attitudes about PHEVs than had been anticipated.

Half of all consumers reported that showing a commitment to the environment through the purchase of a PHEV was "very important" to them. This kind of overt demonstration of a commitment to buying environmentally friendly products---known as "badging"---has long been recognized as a powerful influence on purchases of many different "green" products, Curtin says.

But when asked what they thought was the main advantage of a PHEV---reducing money spent on fuel, reducing vehicle emissions or reducing dependence on foreign oil---54 percent reported that reducing dependence on foreign oil was the main advantage.

"Reducing vehicle emissions was by far the least frequently cited advantage," Curtin said. "Just 15 percent of all consumers cited that as the main advantage."

Surprisingly, only 31 percent thought reducing money spent on fuel was the main advantage, even though the price of gas was high during the time the survey was conducted. When the survey started in July 2008, gas prices were near their all-time peak level (\$4.28 per gallon) and then fell sharply during the period of data collection. But the researchers found no relationship between PHEV purchase probabilities and the price of gas.

"The data provide strong evidence that a combination of economic and social incentives may be most effective for the successful introduction of PHEVs," Curtin said. "The survey also showed the significant influence of hybrid vehicles in signaling people's commitment to a clean environment.

"Nonetheless, consumer attitudes toward the environment are less compelling than economic criteria in explaining hybrid purchase probabilities. Presumably, if PHEVs are priced so that consumers can

recoup their initial investments over a reasonable time period, consumers would find ample economic justification for their purchase. The critical role of environmental and other non-economic attitudes may be to provide the initial burst of interest and sales to propel the appeal of PHEVs to the mass market."

The analysis also examined how vehicle usage patterns and currently owned vehicle choices, as well as demographic characteristics such as age, income, education and gender, are connected to preferences for PHEVs. Additional correlates of purchase probabilities, including location and availability of outlets for recharging, and preferences for new technologies, are also analyzed in the survey report.

More information: The full report is available at www.umich.edu/~umsurvey

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