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Carnegie Mellon Researchers Find Win-Win Situation With Small-Capacity Plug-In Hybrid Vehicles

PITTSBURGH—A team of researchers at Carnegie Mellon University report in a new study that some plug-in hybrid electric vehicles could help drivers save money while addressing global warming and oil dependency.

"When charged frequently, plug-in hybrid vehicles with small battery packs offer the largest reductions of greenhouse gas emissions, gasoline consumption and lifetime vehicle cost," said study leader Jeremy J. Michalek, an assistant professor of mechanical engineering and engineering and public policy at Carnegie Mellon.

Plug-in hybrid vehicles use battery packs to store energy and propel the vehicle partly on electricity instead of gasoline. "On average, electric power creates fewer greenhouse gas emissions per mile than gasoline in the U.S., and larger battery packs allow drivers to go farther on electric power. But batteries are expensive, and their extra weight lowers the vehicle's efficiency," Michalek said.

The study used computer simulation models to account for the weight and cost of plug-in battery packs. "We looked at a wide range of scenarios from fluctuating gasoline prices to new battery technology and carbon taxes. The core conclusion is consistent: For urban drivers who charge frequently — every 20 miles or less — plug-in vehicles with small battery packs sized for about seven miles of electric travel per charge can reduce gasoline consumption, greenhouse gas emissions and lifetime cost. For those who can't charge often, large-capacity plug-in vehicles sized for 40 or more miles of electric travel will still reduce gasoline consumption and greenhouse gas emissions, but at a higher lifetime cost," said Michalek.

President Barack Obama has set a target of one million electric cars on U.S. roads by 2012. To meet that goal, industry experts estimate that automakers will need about $40 billion worth of domestically produced batteries. Battery makers are expected to get some of the $25 billion set aside last

year under Washington's Advanced Technology Vehicle Manufacturing Program to speed the commercialization of green cars.

"Often new technologies are initially more expensive than established technologies. What's encouraging is that today's plug-in technology appears to offer some drivers the chance to save money while addressing oil dependency and global warming," Michalek said.

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About Carnegie Mellon: Carnegie Mellon is a private research university with a distinctive mix of programs in engineering, computer science, robotics, business, public policy, science and social science, fine arts and the humanities. More than 11,000 undergraduate and graduate students receive an education characterized by its focus on creating and implementing solutions for real problems, interdisciplinary collaboration, and innovation. A small student-to-faculty ratio provides an opportunity for close interaction between students and professors. While technology is pervasive on its 145-acre Pittsburgh campus, Carnegie Mellon is also distinctive among leading research universities for its world-renowned programs in its College of Fine Arts. A global university, Carnegie Mellon has campuses in California's Silicon Valley and Qatar, and programs in Asia, Australia and Europe. For more, see www.cmu.edu.