

Transportation researchers to test Toyota plug-in hybrid vehicles

The University of California, Berkeley, has been awarded \$750,000 to conduct, along with project partner groups, the first real-world tests of and research with an automaker-produced, plug-in hybrid electric passenger vehicle (PHEV), the campus's Institute of Transportation Studies announced today.

UC Berkeley transportation researchers will work on the project with the California Air Resources Board, California Energy Commission, Toyota Motor Sales, U.S.A., Inc., UC Irvine and the Bay Area Air Quality Management District. Researchers will study user behavioral response - including recharging and refueling patterns - to PHEV technology, and conduct technical energy use and environmental and economic assessments.

The effort will be led by co-principal investigators Susan Shaheen and Timothy Lipman, researchers at UC Berkeley's Institute of Transportation Studies (ITS). Funding for the grant comes from the Alternative Fuel Incentive Program of California Assembly Bill 1811.

"We are excited by this opportunity to work closely with Toyota and our other partners on understanding such an exciting new vehicle technology," said Shaheen. "This agreement marks a major milestone in the relationship between the university and Toyota."

Under the agreement, Toyota is providing vehicle technology and support engineering services to allow the PHEV and fuel cell vehicles to be tested and analyzed under various conditions. The Bay Area Air Quality Management District will support air pollutant emission and air quality modeling efforts led by UC Irvine in collaboration with the South Coast Air Quality Management District. UC Irvine will also receive a PHEV to test and analyze, and will work with UC Berkeley on behavioral response assessments for Southern California settings.

"Plug-in hybrid vehicles are a promising technology for reducing gasoline use along with emissions of air pollutants and greenhouse gases," said Lipman, a research director for the Transportation Sustainability Research Center, which brings together six UC Berkeley units to explore a wide range of sustainable transportation and planning solutions. "Toyota has been leading the world in hybrid vehicle development over the past several years, and this project is an exciting next chapter in that story."

The prototype PHEV system is designed to operate in a manner similar to that of the current Toyota Prius, switching from pure-electric mode to gas-engine mode to a blended gas-electric mode. According to a statement by Toyota, "the big advantage is that the PHEV's prototype battery pack is capable of storing significantly higher levels of electricity supplied by 'plugging into the grid' for periodic recharging sessions.

"With significantly more electric power in reserve, the vehicle will be capable of operating in pure-electric mode for longer periods of time and at much higher speeds than the current Prius. This will result in substantial gains in fuel economy ... over current conventional hybrid systems."

The PHEV will join existing fuel cell hybrid vehicles at ITS in a broader sustainable mobility partnership with a variety of industry and state partners. The projects seek to understand how consumers perceive and respond to the relative strengths and weaknesses of various transportation technologies.

The new PHEV research also complements work on alternative transportation fuels that is underway and proposed at UC Berkeley and Lawrence Berkeley National Laboratory (LBNL). In February 2007, global

energy firm BP announced that it had selected UC Berkeley, in partnership with LBNL and the University of Illinois at Urbana-Champaign, to lead a \$500 million research effort to develop new energy sources that will be sustainable, commercially viable and environmentally friendly.

"UC Berkeley and LBNL are committed to developing new scientific insights, new technologies and new policies to help meet the energy and climate change challenges facing us today," said Alex Farrell, assistant professor of energy and resources and director of the Transportation Sustainability Research Center at ITS. "The PHEV project is an important component of this effort. UC Berkeley researchers have particular expertise with studying electric-drive vehicle technologies, behavioral responses to new transportation technologies, and electrical power grids, which made the campus particularly attractive to Toyota as a research partner for the PHEV project."

In conducting the research project, the UC Berkeley team expects to involve campus researchers and graduate students at ITS and the Energy and Resources Group, as well as to collaborate closely with the Advanced Power and Energy Program at UC Irvine.

Source: UC Berkeley

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