



Welcome to PHEV News, the latest news and information on Plug-in Hybrid Electric Vehicles program at The Ohio State University, Center for Automotive Research.



Workshop held at OSU CAR

The SMART@CAR inaugural meeting, held on October 23, 2008 at OSU-CAR was a huge success with over 30 people in attendance, representing 11 companies (<http://car.osu.edu/node/109>) including: automotive OEMs and suppliers; electric utility distribution and generation companies; regional transmission organizations; energy services companies; smart metering suppliers; power electronics suppliers; and government agencies. The event consisted of two main parts:

- presentations by OSU researchers/staff on SMART@CAR Research Thrusts and current PHEV research activities at CAR.
- a moderated breakout session involving all the attendees to share ideas on what needs to be done, and how, to better understand the opportunities created by PHEVs.

All the material (presentations and project descriptions) are available on the SMART@CAR website www.car.osu.edu/smartatcar

Clean Fuels Ohio to Partner with OSU's SMART@CAR on Electric Drive Conference

By Sam Spofforth

As reported in last month's "Update," Clean Fuels Ohio received grants from the George Gund and Cleveland foundations to launch a policy initiative in 2009. A key element will be focused on the policy, economic development, and infrastructure actions needed for Ohio to put large numbers of electric vehicles on the road. Clean Fuels Ohio plans to organize a conference on this topic in the spring of 2009.

A few months ago, Ohio State University's Center for Automotive Research (CAR) formally launched an initiative called SMART@CAR. Several major industry, government and academic players have joined this effort, through which many OSU and other researchers will work to address key development questions and challenges related to plug-in hybrid electric vehicles (PHEVs).

Clean Fuels Ohio is pleased to announce that we've joined SMART@CAR and agreed to partner with OSU CAR on the spring conference focused on electrification of transportation in Ohio. The date will be set for the conference within the next month. The target audience will be state and

local government officials and regulators, state legislators, business leaders, and local code and zoning officials, though others interested and the public will be welcome. Clean Fuels Ohio hopes to enlist a wide range of partners including electric utilities, automakers, vehicle makers, vehicle and charging system component makers and developers, policy experts and others from Ohio and around the US.

The agenda will include light, medium and heavy electric drive train vehicles available today and coming soon, job creation and economic development aspects of the electric vehicle and charging industry, “smart” charging and metering systems, customer interfaces, and standardization issues, grid connectivity issues including vehicle to grid (V2G) and vehicle to building/home (V2B), variable pricing structures, and battery technology development. We’ll address some challenging issues including lifecycle carbon emissions based on the source of electricity, and battery raw materials and recycling. We’ll look at the complementary relationship between renewable power generation and electric vehicles through the main electric grid or “microgrids.”

Please look for more information about this conference and partnership by January 2009.

Founding Members

- American Electric Power
- Duke Energy
- Electric Transportation Engineering Corporation (eTec)
- PlugSmart/Juice Technologies, LLC
- PJM Interconnection
- Vanner, Inc.
- CAR Industrial Research Consortium (Caterpillar, Chrysler Motors, Eaton, Ford Motor Company, General Motors Corporation, Hitachi, Oshkosh Corporation, and TRC Inc)
- The Ohio State University- College of Engineering

Affiliates

- Buckeye Power, Inc.
- BottomLine Resource Technologies LLC
- Clean Fuels Ohio

News

OSU-CAR fields its first PHEV

A Toyota Prius was recently converted into PHEV with an additional 5kWh Hymotion A123 battery pack. This vehicle represents OSU-CAR’s first passenger PHEV and is being equipped with data acquisition systems to study duty cycles, fuel economy, battery charging cycles, etc. Data acquired from this vehicle

will be also used to validate models used to estimate how plug-ins can perform in real world conditions, and the effects of PHEV penetration on the grid. Data from this vehicle and from other PHEVs operated by other members of the Consortium (AEP, Buckeye Power, eTec) will provide information of importance not only to the transportation sector, but also to utilities, and batteries, power electronics and smart charging system suppliers.

SMART@CAR on Green Car Congress

Green Car Congress' mission is to provide timely, high-quality editorial about the full spectrum of energy options, technologies, products, issues and policies related to sustainable mobility. Main goals are 1) to provide timely and accurate reporting and analysis of relevant developments around the world; 2) to take the panoptic view, providing comprehensive coverage and the context critical to understanding and evaluating our emerging energy options. Green Car Congress' audience comprises members of every segment of the energy and transportation markets: industry, government, academia and the public. Read the article at <http://www.greencarcongress.com/2008/11/ohio-state-univ.html>

Current Research:

On January 2nd, three SMART@CAR research projects were officially launched, based on the recommendations of the consortium members:

Modeling of PHEVs and interactions with the grid: energy, economics and environmental analysis on residential, commercial and industrial scale (PI: Matthew Roberts, roberts.628@osu.edu)

This project identifies issues related to modeling the interaction between plug-in hybrid electric vehicle and electric vehicle charging, and vehicle-to-grid/building (V2G/V2B) scenarios including residential, commercial and industrial cases. The aim of the project is to develop models of PHEV-grid interaction for different charging scenarios to assess: the impacts of PHEV market penetration levels on the electric transmission and distribution grids; vehicle owner and facility owner charging costs; and to provide a framework for development and testing of new policies and control algorithms.

PHEV Fleet Study (PI: Shawn Midlam-Mohler, midlam-mohler.1@osu.edu)

This project aims to create and maintain a database containing all charging and duty cycle data collected from a growing PHEV fleet. The real-world data provided by these vehicles are collected, archived, organized and analyzed. The raw and processed data and the results of the analysis are shared with the members of the consortium. In order to achieve the purpose of a shared database, standard data formats and acquisition systems are defined to simplify the up- and down-load of information.

Smart Charging and related Connectivity Issues (PI: Jin Wang, wang@ece.osu.edu)

Based on technical analysis and real-time simulation, this project is designed to answer the most fundamental questions on smart charging and related intelligent control strategies. The project aims to analyze transient interactions between the PHEV and the grid; to provide recommendations on communication protocols and protection; and on how to maximize the networking capability with bi-directional power flow .

In addition, the following projects funded by the CAR Industrial Consortium with support from the automotive industry round out the portfolio:

PHEV Energy Management

The aim of this project is to investigate control strategies for plug-in hybrid electric vehicles, with the objective of minimizing multiple objectives, such as the fuel consumption and pollutant emissions, over a trip or driving cycle.

This project is funded by the CAR Industrial Consortium (<http://car.osu.edu/Consortium>) and leverages 10 years of Consortium experience related to HEV energy management.

PHEV Battery Aging Studies

The aim of this project is to improve the current “battery aging” model that is directly linked to the duty cycles and permits battery life estimation under different conditions. This model is based on a more detailed analysis of battery duty cycles (history of state of charge, depth of discharge, current levels, temperatures) under different scenarios and driving needs.

This project is funded by CAR Industrial Consortium (<http://car.osu.edu/Consortium>) and leverages 6 years of Consortium projects related to modeling, characterization and aging of advanced batteries

Contact Information

For additional information and to join the program, please visit our website (www.car.osu.edu/smartatcar) or contact:

Dr. Vincenzo Marano, Program Manager

OSU CAR, 930 Kinnear Road, Columbus, OH 43212

Tel. 614.247.8690

marano.8@osu.edu