



## Power Systems Engineering Research Center

# Power System Level Impacts of Plug-In Hybrid Vehicles

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at Urbana/Champaign

Public Webinar  
December 18, 2009

1:00-2:00 p.m. Eastern Time (10:00-11:00 a.m. Pacific)

Based on a PSERC Report: [Executive Summary](#) | [Report for Member Viewing Only](#)

### Description:

Plug-in hybrid electric vehicles (PHEVs) offer an attractive solution to a growing dependence on imported foreign oil, offering potential benefits along with critical issues for the electric power industry. The impact of PHEVs on the power grid was investigated in a PSERC project. The project's methodology was based on three procedures: (a) typical use of PHEVs incorporating human habits and terrain on which cars are driven for the purpose of evaluating the resulting electric and gas energy consumption; (b) simulation of the electric infrastructure (i.e., distribution systems) and the loading patterns that results from PHEV deployment, including the effects on the expected life of distribution transformers, (c) impact of PHEV deployment on energy resource use in the power grid, and (d) impact of PHEV deployment on power system operation and on the operational security of the power grid. Appropriate models were used to capture the interactions between PHEV's and the complexities of a power grid and distribution system. This presentation will overview the findings of this PSERC project.

### Biographies

**Sakis Meliopoulos** is Georgia Power Distinguished professor of electrical and computer engineering, Georgia Institute of Technology. He received the M.E. and E.E. diploma from the National Technical University of Athens, Greece, in 1972; the M.S.E.E. and Ph.D. degrees from the Georgia Institute of Technology in 1974 and 1976, respectively. In 1971, he worked for Western Electric in Atlanta, Georgia. In 1976, he joined the Faculty of Electrical Engineering, Georgia Institute of Technology, where he is presently a Georgia Power Distinguished Professor. He is active in teaching and research in the general areas of modeling, analysis, and control of power systems. He has made significant contributions to power system grounding, harmonics, and reliability assessment of power systems. He is the author of the books, *Power Systems Grounding and Transients*, Marcel Dekker, June 1988, *Lightning and Overvoltage Protection*, Section 27, Standard Handbook for Electrical Engineers, McGraw Hill, 1993. He holds three patents and he has published over 220 technical papers. In 2005 he received the IEEE Richard Kaufman Award. Dr. Meliopoulos is the Chairman of the Georgia Tech Protective Relaying Conference, a Fellow of the IEEE and a member of Sigma Xi.

Thomas J. Overbye is the Fox Family Professor of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign (UIUC). He received his BS, MS, and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison in 1983, 1988 and 1991 respectively. Prior to joining UIUC he was employed with Madison Gas and Electric Company from 1983 to 1991. He has served on the U.S. DOE Power Outage Study Team in 1999, helped with their National Transmission Grid study in 2002, and served on the August 14<sup>th</sup> 2003 Blackout Investigation team. Dr. Overbye is the original developer of PowerWorld Simulator, an innovative software package for power system analysis and visualization, and a co-founder of PowerWorld Corporation. He is also the recipient of the Alexander Schwarzkopf Prize for Technological Innovation, and a University of Wisconsin-Madison College of Engineering Distinguished Achievement Award.

### Speaker Contact Information

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### Related PSERC webinar:

[The Case for Plug-In Hybrid Electric Vehicles \(07-10; December 4, 2007\)](#)  
Speaker: Jerome Meisel, Georgia Institute of Technology