Impact of Plug-in Hybrid Electric Vehicles with Vehicle-to-Grid Capabilities on Islanded Distribution Systems

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PSERC Public Webinar
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Description
The Smart Grid Initiative (SGI) encourages integration of storage and peak-shaving technologies including plug-in hybrid electric vehicles (PHEVs) to the electric distribution system for enhancing performance and efficiency. PHEV sales in the US are expected to significantly increase in the car and light-truck market primarily due to their potential to lower fuel costs by reducing fossil fuel consumption and to lower emissions. In this talk, a methodology is proposed to determine the impact of penetration of a PHEV fleet with vehicle-to-grid (V2G) capabilities on electric distribution systems. The methodology builds on the results of an existing probabilistic simulation of daily behavioral characteristics of a PHEV fleet to determine charging patterns of the fleet vehicles (by Meliopoulos et al.), which are then used for utility peak-shaving purposes through a linear programming (LP) optimization method. The charging patterns of the simulated PHEV fleet are used to determine the impact of PHEVs on the reliability of a distribution test system under islanded mode of operation, i.e., a microgrid. This webinar is based on research in the PSERC project “Implications of the Smart Grid Initiative on Distribution Engineering.”

Biography
Sid Suryanarayanan received a PhD in electrical engineering from Arizona State University in 2004. His research interests are in the area of modern electric power systems, with specific focus on design, operation, and economics of finite-inertia systems and integration of renewable energy systems to electric grids. He was the recipient of the IEEE Power & Energy Society's T. Burke Hayes Faculty Recognition Award in 2009. Suryanarayanan serves as the site director of the Center for Research and Education in Wind (CREW), and as a 2011-2012 Resident Faculty Fellow of the School of Global Environmental Sustainability (SoGES) at Colorado State University. In June 2011, he was selected by the US National Academy of Engineering as an invited general participant to the US Frontiers of Engineering Symposium.
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**Registration for Webinar Participation:** None required. There is no charge for participating!

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