

Researchers generate electric power savings

December 8 2008

Imagine being away over the holidays with most of the electric power in your home turned off while the neighbors host their holiday guests, using lots of electricity.

During this peak season of electric power use, wouldn't it be nice to get a substantial discount on your next bill for not putting a heavy load on the local electric power network?

The challenge to accomplish this involves accurate metering at the different points of consumption and reliable communications between all electric meters and the local electric utility.

"Smart meters" and "advanced-metering infrastructure" technologies could provide a solution for this problem. As a result, with the ability to monitor the entire power grid in real time, the utility can ensure uninterrupted service, improve distribution efficiency, save energy and reduce operating costs.

An interdisciplinary research team led by Taufiqar Khan and Irina Viktorova, professors in mathematical sciences at Clemson University, is developing mathematical models of complex power-distribution networks. The research effort is funded by \$285,000 from Itron Inc., a leading technology provider and critical source of knowledge to the global energy and water industries.

"The challenges of modeling and system identification of the smart grid lies in the fact that the network is vast, complex, time-variant, non-linear

and noisy," said Khan. "By noisy, I mean the millions of light bulbs, computers, televisions, appliances, heaters and electrical motors going on and off contribute to the disorderly pattern of variations of voltage, current and impedance of the AC network. Therefore, we are working on mathematical solutions to optimize metering and communications."

Khan cites other potential money-saving scenarios such as keeping the thermostat set higher than normal during hot summer days when no one is home or programming the dishwasher for a midnight cycle, all for a discount on the next power bill.

"The department of mathematical sciences is very excited about the cooperative work with Itron Inc. and we expect that this initial study is just the beginning of a long-term partnership," said mathematics department chairman Robert Taylor, senior adviser to the project. "The metering and communication data provide excellent opportunities for applied mathematical and statistical modeling and will lead to greater efficiencies in the energy industry. The involvement of faculty, graduate students and undergraduate students in this endeavor is directly aligned with the research and instructional missions of our department and university. We are also committed to tackling the problems relevant to Itron."

"We are very pleased that Itron Inc. has chosen Clemson as its research partner in pursuit of this important goal," said Chris Przirembel, Clemson University vice president for research and economic development. "Improvements that increase energy efficiencies and cut costs are of value to individuals and to businesses. The research has far-reaching implications."

Source: Clemson University

Citation: Researchers generate electric power savings (2008, December 8) retrieved 6 February 2023 from <https://phys.org/news/2008-12-electric-power.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.