National Energy and Transportation Infrastructure: Long-Term Planning for Cost, Sustainability, and Resiliency

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PSERC Public Webinar
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2:00-3:00 p.m. Eastern Time (11:00-12:00 p.m. Pacific)

Description:
This webinar will describe results of efforts to perform long-term energy and transportation system infrastructure planning at a national level, in terms of a new software application and results of using that software on data characterizing US energy and transportation infrastructure. The software, called NETPLAN, is a multi-objective optimizer that models national energy systems (electric generation and transmission, and the fuel systems which supply them), together with the transportation systems used to move both freight and passengers. NETPLAN identifies 40-year infrastructure investment strategies, at the national level, which are “good” in terms of low capital and operating costs, low environmental impact (including CO\textsubscript{2} emissions), and high resiliency. A notion of resiliency is introduced based on the system’s ability to limit variability of operational cost under very large disruptions such as the 2005 Katrina hurricanes. Significant effort has gone into developing a database of existing and future national infrastructures which causes NETPLAN to be computation-intensive, a problem that has been addressed via use of parallelized high performance computer clusters. Some of the questions this software is being used to address include:

- What is the best combination of wind, solar, geothermal, nuclear, gas, clean-coal, and hydrogen-based technologies to reduce CO\textsubscript{2} emissions?
- What technologies and topologies should be used in designing a national electric transmission superhighway system?
- What is the best mix of electricity, petroleum, and biofuels to supply our automotive needs?
- To what extent can electric high-speed rail reduce energy use and transportation-related emissions while competing with air and highway travel?

This webinar is based in part on work performed in an NSF-funded project called “National Energy and Transportation for Sustainability, Cost, & Resiliency in the 21rst Century” (NETSCORE21).
Biography
James D. McCalley received the B.S., M.S., and Ph.D. degrees in electrical engineering from Georgia Institute of Technology, Atlanta, in 1982, 1986, and 1992, respectively. He was with Pacific Gas & Electric Company, San Francisco, CA, from 1985 to 1990 as a Transmission Planning Engineer. He is an IEEE fellow since 2004. He is now the Harpole Professor of Electrical and Computer Engineering at Iowa State University, Ames, where he has been employed since 1992.

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Participation by Webinar: To connect to the webinar, click here and then on 6/7/2011. The webinar will include the audio and slides (but no video). You will be able to send in your questions via the website. The archived webinar will be available immediately afterwards.

Registration for Webinar Participation: None required. There is no charge for participating!

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Assistance: If you have any questions, please contact Theresa Herr, PSERC’s administrative assistant, at 480-965-1643 or Theresa.Herr@asu.edu. You can also contact Dennis Ray, PSERC Deputy Director, at 608-265-3808 or djray@engr.wisc.edu.

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