

FEEDER CENTER AND THE DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
Present the Spring 2014 EECS Seminar Series



Dr. Thomas E. McDermott
Swanson School of Engineering, University of Pittsburgh

**“Challenges and Opportunities in Renewable Energy Integration
into the Electric Power System”**
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ABSTRACT

Renewable energy sources like wind and solar offer exciting new opportunities for emissions reduction, water conservation, balance-of-trade improvements and other societal benefits. Power electronic converters, which typically interface renewable energy sources to the electric power system, offer further opportunities for distributed control and management of reactive power, losses and voltage profiles. In order to realize these opportunities, the engineering community will have to overcome barriers and challenges to widespread integration of renewable energy sources. These challenges include the reliability and power quality impacts of variable power output, the design of control and protection for distributed sources, and the need for distributed sources to help support the grid, or alternatively, to meet the challenge of implementing widespread microgrids. After more than 100 years of AC power system dominance, it may be time to re-evaluate the use of DC power systems in certain situations. This talk will address research and education needs to meet these challenges, with specific reference to IEEE standard-making for distributed energy resources, to solar integration challenges in the Northeast, and to photovoltaic inverter modeling for system impact studies. Research projects supported by FirstEnergy, Duquesne Light and the National Energy Technology Laboratory will be presented. A new distance-enabled post-baccalaureate certificate in electric power at the University of Pittsburgh will also be presented.



BIOGRAPHY

Thomas E. McDermott is an Assistant Professor at the University of Pittsburgh, with over 30 years of industrial experience in consulting and software development. His research interests include electric power distribution systems, renewable energy, power electronics, electromagnetics, and circuit simulation. Tom is a registered professional engineer in Pennsylvania and a Fellow of the IEEE. He has a B. S. and M. Eng. in Electric Power from Rensselaer, and a Ph.D. in Electrical Engineering from Virginia Tech. CV at <http://www.pitt.edu/~tem42/>