Texas A&M Energy Institute Lecture Series

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TEES TEXAS A&M ENGINEERING EXPERIMENT STATION

An Optimization Model for Energy Management Within an Advanced Metering Infrastructure Framework

Dr. Trevor Hale

Texas A&M University

Clinical Professor
Department of Information and Operations Management
Mays Business School

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3:30 - 4:30 p.m.

Frederick E. Giesecke Engineering Research Building
Third Floor Conference Room

Biography

Trevor Hale is a clinical full professor of operations management at the Mays Business School at Texas A&M University. He received a Ph.D. in operations research from the Look College of Engineering at Texas A&M University, a M.S. in engineering management from Northeastern University, and a B.S. in industrial and management systems engineering from Penn State. Previously, he was a faculty member at the University of Houston-Downtown, Ohio University, and Colorado State University-Pueblo.

Dr. Hale is a third-generation professor and a fifth-generation Texan. His father, the late Dr. Leslie C. Hale, Jr., was an A. Robert Noll Professor of Electrical Engineering at Penn State while his father's father was a professor of business at then Texas Western, now UTEP.

His research interests are in the areas of location science, warehouse science, and grid-scale energy management. Dr. Hale spends most of his summers as an Office of Naval Research Senior Faculty Fellow at Naval Base Ventura County in Port Hueneme, California. He is the managing co-author of Pearson's number one textbook in business analytics, Quantitative Analysis for Management, now in its 13th edition. His research has been published in the Annals of Operations Research, the European Journal of Operational Research, the International Journal of Physical Distribution & Logistics Management, and the International Journal of Production Research among other outlets. He is a senior member of both INFORMS and DSI.

Abstract

Advanced metering infrastructure (AMI) is the natural extension of advance meter reading (AMR) technology most often incarnated as "smart meters." Whereas smart meters allowed utility companies to determine energy usage from afar, this research will show that next-gen two-way smart meters and other peripheries will enable consumers, prosumers, and regulatory bodies to communicate and operate the national grid more efficiently. This research has three objectives:

1. Differentiate AMI from today's smart meters: AMI overlays two-way communication capabilities onto the grid…smart meters only one (kWH used to the utility company).
2. Demonstrate the existence of a win-win, economic pathway to pay for AMI…that simultaneously improves national security.
3. Delineate a consumer based mixed-integer non-linear optimization model for distributed generation (DG), distributed storage (DS), time-of-use (TOU) rates, and time-of-delivery (TOD) rates…which, in some cases, can turn electricity bills negative.

Some avenues of future research concludes this presentation.