

# AICHE Workshop on Smart Grid for the Chemical Process Industry

**September 25-26, 2013  
Chicago, IL**

Co-sponsored by  
AIChE – Computing and Systems Technology (CAST)  
Division and  
IIT – Wanger Institute for Sustainable Energy  
Research (WISER)



<https://www.aiche.org/conferences/workshop-on-smart-grid-chemical-process-industry/2013>

## Program Description

Widespread adoption of renewable power sources is expected to place substantial burden on electric power distribution systems (the grid). The smart grid is defined as a multifaceted approach to maintaining equality between generated and consumed power. The Demand Response (DR) approach incentivizes consumers to track supply through time-of-use market based pricing of electric energy. Under such a scenario, those with sufficient operational flexibility will be able to exploit low price periods while avoiding price spikes and ultimately reduce average energy costs.

This workshop will focus on the Chemical Process Industry and explore its role within the demand response community. In general, the process related questions of operational flexibility and methods to evaluate and utilize this flexibility will be addressed. Workshop participants will seek to answer the following questions:

- Do existing chemical plants possess sufficient flexibility for DR?
- How does one implement DR to exploit process flexibility?
- What is the cost saving one can expect from DR?
- Are there well developed assessment methods?
- Are there opportunities to create additional flexibility?
- Can one convert chemical processes from steam to electric driven?
- What is the payback period of creating new flexibility?
- What is the role of a steam/electric co-generation plant?
- What are the methods/experiences of others in the demand response community?

## Pre-workshop Activity (September 23<sup>rd</sup>-25<sup>th</sup>)

**Great Lakes Symposium on Smart Grid and the New Energy Economy**  
Co-sponsored by IEEE Power and Energy Society and IIT Galvin Center for Electricity Innovation <http://www.greatlakessymposium.net/>

## Venue

Workshop will be held on the campus of the Illinois Institute of Technology in Chicago. Please see the website for information on registration and accommodation details.

# AIChE Workshop on Smart Grid for the Chemical Process Industry

September 25-26, 2013 – Chicago, IL

Wednesday September 25, 2013

## **Plenary Session** (1:30-2:30pm)

Mary Ann Piette, Lawrence Berkeley National Laboratory – Recent Experience and Future Directions of Demand Response Strategies in Commercial Buildings”

## **Invited Session – Demand Response from Buildings Systems**

(2:30-5:00pm)

Reduced-Order Modeling Strategies for Predictive Energy Management in Buildings, Cara Touretzky, Wesley Cole, Atila Novoselac, Michael Baldea, and Thomas Edgar, University of Texas at Austin

Integrating Large Commercial Building HVAC Operations with Electric Grid Operations and Markets for Significant Efficiency and Expense Savings, Vincent J. Cushing, QCoefficient, Inc

HVAC Control Using Infinite-horizon Economic MPC, David I. Mendoza-Serrano and Donald J. Chmielewski, Illinois Institute of Technology

Advances in Multi-objective Optimization and Uncertainty Modeling for Building Systems, Victor M. Zavala, Argonne National Laboratory

Energy Microgrids and Integrated Building Solutions Rui Huang and Stella M. Oggianu, United Technologies Research Center

## **Opening Reception** (6:00-8:00pm) Workshop Welcoming Remarks

Maria Burka, National Science Foundation – Present and Near Future NSF Funding for Smart Grid Research

Thursday September 26, 2013

## **Plenary Session** (8:15-9:15am)

Ernst Scholtz, ABB Corporate Research – Active participation of Industry in the Smart Grid (with Iiro Harjunkoski and Xiaoming Feng)

## **Invited Session – Industrial Demand Response I** (9:15-12:00pm)

Large Industrials and Demand Response in the United States, David Heitzer, EDF Energy Services

Assessing the Benefits of Stochastic Market Clearing, Victor M. Zavala, Argonne National Laboratory

Economic Dispatch of a Combined Heat and Power Plant, Jong S. Kim and Thomas F. Edgar, University of Texas at Austin

A Distributed Control Framework for Smart Grid Development, Jinfeng Liu, University of Alberta and Panagiotis D. Christofides, University of California, Los Angeles

## **Plenary Session** (1:15-2:15pm)

R. DeWayne Todd, Alcoa Power Generating, Inc., – Process Focused Dynamic Demand Response in Organized Markets

## **Invited Session – Industrial Demand Response II** (2:15pm-5:30pm)

Flexible and Efficient Operation for Power Generation and Process Industry – A GE Perspective, Aditya Kumar, GE Global Research

Use of Low Cost Electrical Power in Petrochemical Process Units, Dennis O’Brien, Jacobs Consultancy and Donald J. Chmielewski, Illinois Institute of Technology

Supply Driven-Operation of Processes, Alexander Mitsos, Ganzhou Wang and Wolfgang Marquardt, RWTH Aachen University; Amin Ghoheity and Chris Williams, Massachusetts Institute of Technology

Improving Energy Efficiency with Cogeneration Technology, David P. O’Brien, ExxonMobil Gas and Power Marketing Company

Multiscale Optimization for Demand Side Management of Industrial Power-Intensive Processes, Qi Zhang and Ignacio Grossmann, Carnegie Mellon University

## **Dinner and Workshop Keynote** (6:00-8:00pm)

Joseph Paladino, Senior Advisor, Office of Electricity Delivery and Energy Reliability, US Department of Energy – Experience and Observations from the Smart Grid Programs Funded by the Recovery Act of 2009

## **Planning Committee**

**Workshop Chair:** Donald Chmielewski, Illinois Institute of Technology ([chmielewski@iit.edu](mailto:chmielewski@iit.edu))

**Programming Co-Chair:** Rui Huang, United Technologies Research Center

**Arrangements Co-Chair:** David Bahr, Jacobs Consultancy

**AIChE Liaisons:** Kristine Chin and Stephanie Orvoine-Couvrette, AIChE Programming

**CAST Division Liaison:** Michael Baldea, University of Texas at Austin

**Great Lakes Symposium Liaison:** Hamid Arastoopour, WISER – Illinois Institute of Technology