EIGHTH ANNUAL CARNEGIE MELLON CONFERENCE ON THE ELECTRICITY INDUSTRY

DATA-DRIVEN SUSTAINABLE ENERGY SYSTEMS

MONDAY – WEDNESDAY, MARCH 12-14 2012

Home Program Registration Accommodations Presentations

Steering Committee:

(Last updated 2/21/2012)

MARIJA ILIC, CMU-ECE / EPP
Conference Chair

RICHARD SCHULER, Cornell
BOB HAVEMANN, SRC
LEONARD HYMAN, Black&Veatch
JOSE MOURA, CMU

Preliminary Program

Main Program:
Dates: March 13 and 14, 2012
Location: Carnegie Mellon University
Baker Hall A51 – Giant Eagle Auditorium

Pre-Conference Workshop
Date: March 12, 1:00 p.m. - 6:00 p.m.
Location: Carnegie Mellon University
ECE, Hamerschlag Hall – HH 1107
Bombardier Smart Infrastructure Collaboration Center

DOCKET
11-IEP-1D
DATE
RECD. MAR 08 2012

RECEPTION

A reception will be held on Monday night, March 12, 2012, which is the night before the conference begins, location to be announced.
Time: 7:00 P.M. - 8:30 P.M.

CONFERENCE AGENDA

March 13, 2012 — Day 1:
Data-Driven Wind Power Integration; Grid and Customer Data Collection: Status and Open Questions

7:30-8am Breakfast

8-8:15am **Pradeep Khosla, Carnegie Mellon University (CMU) CIT Dean, Welcome**

8:15-8:30am **Marija Ilic, Carnegie Mellon University (CMU-ECE/EPP) and Richard Schuler, Cornell University (CU/Econ), Conference Objectives**

8:30-10:30am, **Session D1.A1 Data-Driven Sustainable Energy Systems: Wind Power Integration in Real-World Complex Electric Energy Systems**

Session Coordinator: Charlie Smith, Utility Wind Integration Group (UWIG)
Presenters: Charlie Smith, UWIG, Wind Integration: Status and Prospects
Dale Osborn, MISO Energy
Paul McGlynn, PJM, Plans for Wind Integration in PJM: Progress and Chllenges
Jon Black, ISO-NE, Plans for Wind Integration in ISO-NI: Progress and Challenges
Fred Huang, ERCOT, System Planning Challenges of Wind Integration in ERCOT.
Marija Ilic, CMU, Dynamic Monitoring and Decision Systems (DYMONDS) Simulator for Low-Cost Green Azores Islands.

10:30-10:45am Coffee Break

10:45-12:15pm, **Session D1.A2 Data-Driven Sustainable Energy Systems: Large-Scale Wind Power Integration: Fundamental Challenges and Opportunities**
Session Coordinator: Le Xie, Texas A&M University
Presenters: Niamh Troy and Mark O'Malley, University College, Dublin, Ireland
M. L. Ferreira and P. Carvalho, Instituto Superior Tecnico (IST), Portugal, Enhanced DPlan for Enabling Large Panetration of DERs in Electricite de Portugal (EdP).
Le Xie, Texas A&M, Model-Predictive Sceduling for ERCOT.
Stephen Rose, Emily Fertig, David Luke Oates, Paulina Jaramillo, and Jay Apt, CEIC, The RenewElec Project: Exploring Challenges and Opportunities for Integrating Variable and Intermittent Renewable Resources.
Christina Jaworsky, Konstantin Turitsyn, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, Limitations in Reduction of Wind Power Intermittency with Storage Technologies.

12:15-1:15pm **Lunch Speaker: Dr Krishna Kant, National Science Foundation, Sustainability Initiative and Big Data**

1:15pm-2:45pm, **Session D1.P1 Part I—Grid Data: Collection, Communications and Use**
Session Chair: Bruce Fardanesh, NYPA
Presenters: Bruce Fardanesh, NYPA, New Methods for Opeations and Contrl in Future Electric Energy Systems
Ralph Masiello and Waren Katzenstein, KEMA, Adapting AGC to Manage High Renewable Resource Penetration.
Marrasoul J. Mousavi, ABB, Grid Analytics to Enhand Distribution Feeder Performance
M. Cvetkovic and Kevin Bachovchin, CMU ECE, Potential of FACTS and HVDC in Supporting Wind Power Integration.
Bob Cummings, NERC, (TBC)

2:45:-3:00pm Coffee Break

3:00-4:45pm, **Session D1.P2 Part II—Customer Data: Collection, Communications and Use**
Session Chair: Ralph Massielo, KEMA
Presenters: Johanna Mathieu and Duncan Callaway, University of California, Berkeley, The Value of Real-time Data in Conrolling Electric Loads for Demand Reponse
Jessica Harison, KEMA, The Benefits and Challenges of Data-Based Management in Power Systems: Lessons Learned from Three U.S. Case Studies
Jason Black, Battelle, and Yi Zhang and Weiwei Chen, General Electric, Cluster-Based Baselining Method for Determining Load Reductions.
Tom Casten, Recycled Energy Development LLC, New CHP Value Propositions.
Timothy J. McCoy, Electric Ship Office, Ships at Sea: The Original Micro-Grids?
Jeremy Johnson, Hardware Accelleration for Load Flow Computation

5:00-5:30pm Open Discussion on Day 1 Subjects
6-9:00pm Graduate Students Posters, Reception and Dinner
(Dinner Speaker: Leonard Hyman—Business Sustainability)

March 14, 2012 — Day 2:
Toward Systematic Data Use for Sustainable Business and Policy Decision Making

7:30-8am Breakfast

8-9am **Richard Schuler, Rethinking Electricity Markets (Plenary Talk)**

9-10:30am, **Session D2.M1 Data-Driven Business Decisions and Policy Design**
Session Coordinator: Judy Chang, Brattle Group
Presenters: Judy Chang and Kamen Madjarov, Brattle Group, How are Markets Adjusting to Large Amounts of Renewable Generation?
Tim Heidel, ARPA-e, ARPA-e Investments in a More Flexible Grid
Desmond W. H. Cai, Sachin Adlakha, Steven Low, K. Mani Chandy, Caltech, and Paul De Martini, CISCO, The Impact of Distributed Energy Resources on Utility Rate Structure
Richard Wu, LDH Energy, and Marija Ilic, Carnegie Mellon University, Stratum Electricity Market: Toward Multi-temporal Distributed Risk Management for a Sustainable Electricity Provision.
Kevin Forbes, Marco Stampini and, Ernest M. Zampelli, The Catholic University of America, Washington, DC, The Relationship between Wind Energy and System Operator Actions to Ensure Power Grid Reliability: Econometric Evidence from the 50 Hz Transmission System in Germany.
Lizhi Wang, Iowa State University,Measuring and Mitigating PEVs' Potential Impact on Power Systems – A Multi-level Optimization Approach

10:30-10:45am Coffee Break

10:45-12:30pm, **Session D2.M2 Data-Based Change of Operating and Planning Industry Paradigm: Concensus, Cooperation, Portfolia and Minimal Coordination**

Session Coordinator: Steven Low, Caltech
Presenters: Steve Low, Subhomesh Bose, Mani Chandy, Masoud Farivar, Lingwen Gan, Dennice Gayme, Caltech, and Chris Clarke, Southern California Edison, Optimal Power Flow Over Radial Networks.
Nicolas Christin, CMU-INI, Security Challenges in Cyber-Physical Systems.
Alexander Davis, Tamar Krishnamurti, Baruch Fischhoff, & Wändi Bruine de Bruin, CMU, SDS and EPP, Setting a Standard for Electricity Pilot Studies: Meta-analysis and Guidelines for Design and Reporting.
Sanja Cvijic and Marija Ilic; and Peter Feldman, IBM, Zooming-in and Zooming-Out Computer Methods for Simulating Loop Flows and the Need for Directing Flows.
Jhi-Young Joo and Marija Ilic, CMU and Felix Maus, Bosch, Adaptive Load Management (ALM): Possible Implementation of Demand Response According to Well-Understood Value and Choice.
Franz Franchetti, CMU ECE, What Could Deskside Supercomputers Do for the Power Grid?

12:30-1:30 Lunch Break

1:30-3:15pm, **Session D2.P1 Data-Based Methods for Sustainability**
Session Coordinator: Peter Feldman, IBM
Presenters: W. Schulze, Cornell, Overlay of an Environmental Transmission Model on the Super OPF to Simultaneously Account for Air Quality, Locational Reliability and Price.
Sergio Pequito, IST, and Qixing Liu, Soummya Kar, and Marija Ilic, CMU ECE, PMU Placement to Ensure Observable Frequency and Voltage Dynamics: A Structured System Approach.
Dave Loucks, Eaton, Data Analysis Finds Hidden Information in Electrical Systems.
Bruce Mc Millin, Suzanna Long, Joon-Ho Choi, Badrul Chowdhury, Mariesa Crow
Energy Management by Distributed Socio-Ecological Systems, Missouri S&T.
P. Reddy and M. Veloso, CMU, SCS, Factored Models for Multi-Scale Decsion Making in Smart Grid.
H. Illian, Energy Mark, Big Data! How Will it be Used.
Alberto J. Lamadrid, Markets and Demand Management Coupling with Renewable Energy Sources.

3:15-3:30pm Coffee Break

3:30-5:00pm, **Session D2.P2 Real-Time Synchronized Data for Automated Wide-Area Monitoring and Control**
Session Coordinator: Sandy Aivaliotis, Nexans
Presenters: Tip Goodwin, Oncor, Dynamic Line Ratings a Solution for Congested Transmission Lines.
Aranya Chakrabortty, North Carolina State University, George Michailidis University of Michigan and Yufeng Xin , UNC Chapel Hill, Decentralized Algorithms for Oscillation Monitoring in Power Systems from Overwhelming Volumes of Phasor Data.
Charles H. Wells, OSISsoft, Real Time Data Consumption and Archival for the Power Grid.
Jignesh Solanki, West Virginia University, Cloud Computing-Based Architecture for Future Distribution Systems.
Andrew Hsu and Marija Ilic, CMU ECE, A General Distributed Computing and Communications Method for Monitoring and Controlling Electric Energy Systems with Highly Variable Resources

5:00-5:30 **Next Steps and Adjourn**

March 12, 2012
Workshop Tentative Agenda:
Part 1: Roll-out of Upcoming Springer Monograph Entitled:
Engineering IT-Enabled Sustainable Electric Services: The Case of Low-Cost Azores Islands

1:00-1:20pm Marija Ilic, SRC SGRC Director, Engineering IT-Enabled Sustainable Electricity Services: DYMONDS-Based Framework.

1:20-1:40pm Donadee, Jon and Masoud Nazari, Azores Islands Characterization: System Inputs and Electrical System.

1:40-2:00pm Jhi-Young Joo, Assessing the Ability of Different Types of Loads to Participate in Adaptive Load Management.

2:00-2:20pm Xie, Le, Texas A&M, and Jhi-Young Joo, CMU, DYMONDS-Based Scheduling of Generation and Demand for Efficient Utilization of Available Resources: The Case of Azores Islands.

2:20-2:40pm Noha Abdel-Karim, Carnegie Mellon University, Multi-temporal Wind Power Forecasting Models for Operations and Planning: The Case of Azores Islands and NY Control Area.

2:40-3:00pm Break

3:00-3:20pm Nipun Popli, Carnegie Mellon University, Intra-dispatch Wind Power Following: The Case of Azores Islands.

3:20:-3:40pm Qixing Liu, Carnegie Mellon University, Enhanced AGC and AVC to Ensure Frequency Quality during Normal Operations: The Case of Azores Islands.

3:40-4:00pm Milos Cvetkovic and Kevin Bachovchin, Power-Electronically Controlled FACTS for Transient Stabilization of Systems with Wind Power Gusts: The Case of Azores Islands.

4:00:-4:20pm Remco Verzijilbergh, Delft TU, The Role and Value of Electric Vehicles: The Case of Azores Islands.

4:20-4:40pm Marija Ilic, Carnegie Mellon University, Interactive Planning for Sustainable Electric Energy Services.

4:40-5:00pm Marija Ilic, Lessons Learned for Transforming Continental T&D System into an Enabler of Sustainable Electric Energy Services: Illustrations Using IEEE 14 bus and NPCC 36 Equivalent Systems.

5:00-5:20 Break

Part 2 :
Other EESG Research

5:20-5:40pm Siripha Junlakarn and Marija Ilic, Reconfiguration for Differentiated Reliability of Service

5:40-6:00pm Chin-Yen Tee and Marija Ilic, A Possible Framework for Assessing Value of Smart Grid Technologies

6:00-6:20pm Sanja Cvijic and Marija Ilic, Rethinking Computer Methods for Future Electric Energy Systems

7:00pm - **Poster Viewing and Reception**, Holiday Inn Select University Center, 100 Lytton Avenue, Pittsburgh, PA 15213

Campus Map **Contacts** **Organizers** **Archives** **Locations of Interest**