

Leading International Energy Experts Address Global Power Issues



IEEE
SmartGridComm

GAITHERSBURG, MARYLAND, USA 2010

October 4-6, National Institute of Science and Technology



Final Program

www.ieee-smartgridcomm.org



GENERAL INFORMATION • MAP

IEEE SmartGridComm 2010 Badges and Tickets

IEEE SmartGridComm 2010 Badges must be worn at all times and are necessary for entrance into all IEEE SmartGridComm events. Tickets are required for the lunch daily and the Welcome Reception.

Conference Location

The entire conference will be taking place at NIST. Transportation will be provided from the Holiday Inn and Hilton Gaithersburg every morning and evening. Otherwise you will need to secure your own transportation.

Registration

Conference Registration will take place outside the Green Auditorium. All attendees must be registered in order to participate in conference activities.

Registration/Meeting Information Desk Hours

Monday, October 4	8:00 – 18:00
Tuesday, October 5	8:00 – 17:00
Wednesday, October 6	8:00 – 15:00

Lunch

Lunch will be held Monday through Wednesday from 12:30 – 14:00 in the back of the cafeteria.

Coffee Breaks

Coffee breaks will be held Monday through Wednesday outside the Green Auditorium. Please note the times in the program at a glance as they vary from day to day.

Welcome Reception

The Welcome Reception will held Monday, October 4 from 18:00 to 19:30 in the Hall of Flags near the Green Auditorium. (Included with conference registration fee)

Internet Access

Passwords will be provided for wireless access.

Student Travel Grants

Student Travel Grant Recipients can pick up their certificates at the Registration desk during registration hours.

Tipping

This is part of the American way of life, based on the principle that you should pay for any special service. Here are some examples: bartenders: 10 to 15%; bellhops: at least \$2 per bag; taxi drivers: 10 to 20% of the fare; airport attendants: \$1 per bag or \$2-\$3 for a lot of baggage; valet parking attendants: \$2.

Cell Phones/PDAs/Laptops/Beepers

Please be cognizant and respectful of your fellow conference attendees and speakers. During sessions please lower the volume on your electronic devices and put your phones on vibrate mode.

Evaluation Form

An email with a link to the evaluation form will be sent to you. Please be sure to take the time to fill out the form. We value your feedback.

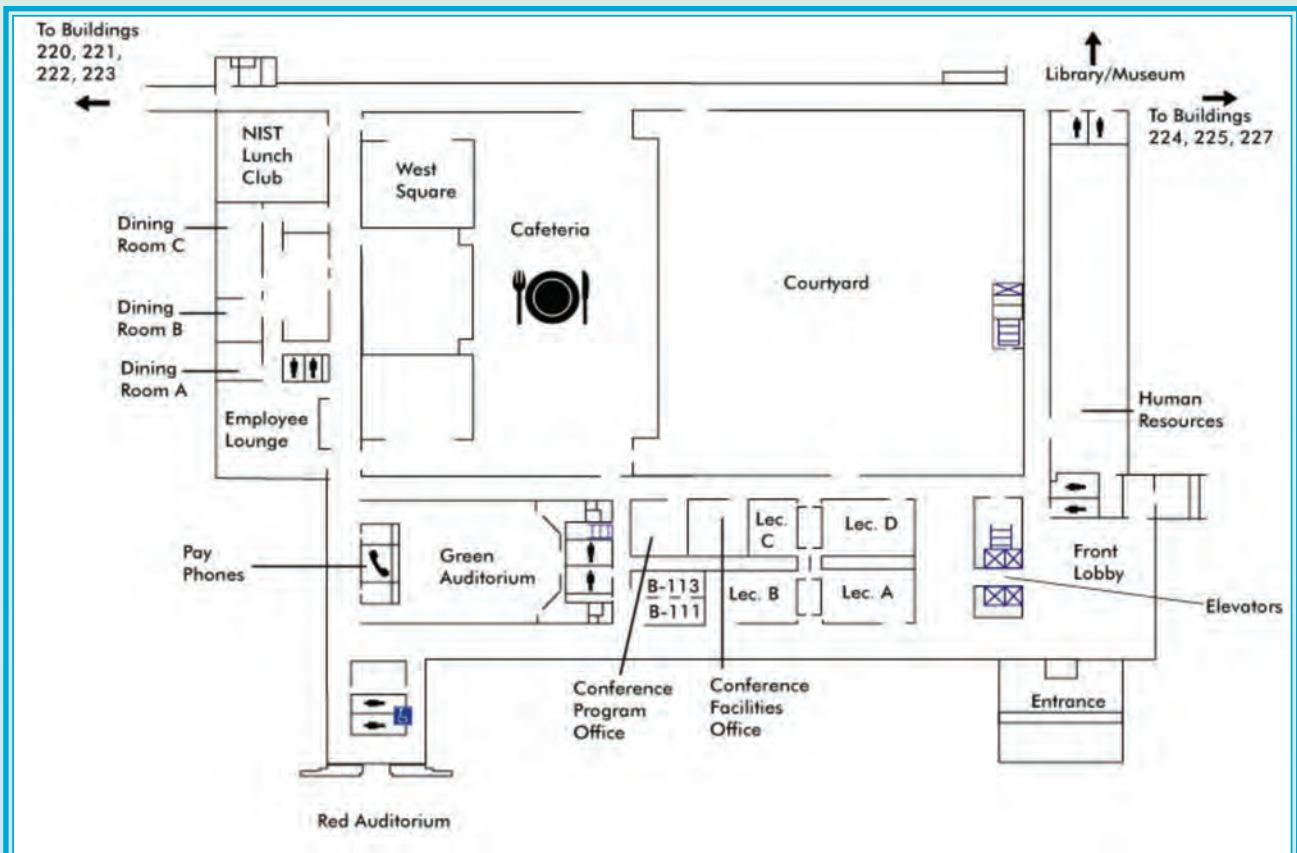


TABLE OF CONTENTS • PROGRAM AT A GLANCE



IEEE SmartGridComm
GAITHERSBURG, MARYLAND, USA 2010
 October 4-6, National Institute of Science and Technology

General Information & MapIFC	Technical Program6
Welcome2	Committees11
Keynote Speakers3	SmartGridComm 2011 CFPIFC

PROGRAM AT A GLANCE

Monday, October 4	Tuesday, October 5	Wednesday, October 6
9:20 - 10:20 Welcome & Keynote Session	9:00 - 10:00 Keynote Session	9:00 - 10:00 Keynote Session
10:20 - 10:50 Break	10:00 - 10:30 Break	
10:50 - 12:30 Technical Sessions	10:30 - 12:30 Technical Sessions	10:30 - 12:30 Technical Sessions
12:30 - 14:00 Lunch		
14:00 - 14:30 Keynote Session	14:00 - 14:30 Keynote Session	14:00 - 14:45 Keynote Session
14:30 - 14:45 Break		14:45 - 15:00 Break
14:45 - 16:30 Technical Sessions	14:45 - 16:45 Technical Sessions	15:00 - 17:00 Technical Sessions
16:30 - 18:00 Panel	16:45 - 17:00 Break	
18:00 - 19:30 Welcome Reception	17:00 - 18:30 Panel	

WELCOME



George Arnold



Stefano Galli



Fred Baker



Hamid Gharavi



Simon Haykin

On behalf of the Organizing Committee, we are pleased to invite you to attend the 1st IEEE International Conference on Smart Grid Communications (SmartGridComm 2010) that will be held at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, USA, October 4-6, 2010.

Sponsored by the IEEE Communications Society (ComSoc), IEEE SmartGridComm is centered on all communications aspects that are relevant to the Smart Grid and aims at bringing together international researchers from Academia, Industry, and National Labs to exchange novel ideas, explore enabling technologies, discuss innovative designs, and share field trial experiences and lessons learned. We have also strived to solicit the international cooperation of several technical communities in an effort aimed at facilitating cross-fertilization in this widely interdisciplinary area. We are proud of the wide response we have received from IEEE Societies as we have obtained an unprecedented level of Technical Co-Sponsorship from 11 IEEE Technical Societies and 2 IEEE Councils.

IEEE SmartGridComm 2010 has been organized in 12 independent Symposia, each one dedicated to a specific aspect of Smart Grid communications. We have received 255 paper submissions by authors in 30 countries and all regions of the world: North America (55%), EMEA (28%), Asia/Pacific (17%). Each paper was carefully peer reviewed by a set of international experts coordinated by our 42 Symposia Chairs and 137 Technical Program Committee members. Nearly 900 reviews were submitted, allowing an average of 3.4 reviews per paper. The top 102 papers were selected for the final program by the Symposia Chairs and the Technical Program Committee Co-Chairs, and will be presented at the conference in 18 technical sessions scheduled in three parallel tracks. Furthermore, the IEEE SmartGridComm 2010 program will include a distinguished set of keynote speakers and two panel sessions.

We sincerely hope that you will join us in making IEEE SmartGridComm 2010 a success and we look forward to welcoming you at NIST in Gaithersburg. At the conference, you will have the chance to hear about the most recent technical advances in Smart Grid communications as well as interact with technical experts, regulators, and industry leaders from all over the world.

Sincerely,

George Arnold, NIST, US
Stefano Galli, Panasonic, US

IEEE SmartGridComm 2010
General Co-Chairs

Fred Baker, Cisco, US
Hamid Gharavi, NIST, US
Simon Haykin, McMaster University, Canada

IEEE SmartGridComm 2010
Technical Program Co-Chairs

KEYNOTE SPEAKERS



Monday, October 4, 2010 • 9:50 – 10:20 • Room: Red Auditorium

Guido Bartels

**General Manager Global Energy & Utilities Industry, IBM
Chairman, GridWise Alliance**

Biography: Guido Bartels joined IBM in 1988. He now manages all of IBM's energy and utilities business as well as the Intelligent Utility Network initiative, the company's portfolio of solutions for the Smart Grid. Mr. Bartels is a member of IBM's Integration & Values team, which includes the top 300 leaders from across the company.

In addition, Mr. Bartels is chairman of the GridWise™ Alliance, an advocacy group of private and public companies that supports a national imperative for modernizing the electricity system of the United States. Under his leadership since 2007, the alliance has grown its membership six-fold. Mr. Bartels has been instrumental in setting up similar organizations in countries such as Australia, Korea, Ireland, Japan, and India. He has co-chaired the GridWeek conference in Washington, D.C., the largest annual Smart Grid event in the United States, since 2007.

Mr. Bartels is also a member of the US Department of Energy's Electricity Advisory Committee (EAC), a thirty-member group representing some of the country's top public and private sector electricity and energy policy leaders. He chaired the EAC Smart Grid Subcommittee, which produced "Smart Grid: Enabler of the New Energy Economy," a report with practical policy recommendations to advance the national Smart Grid agenda.

Bartels serves as vice-chair of the New York State Smart Grid Consortium, a key public-private partnership to promote statewide implementation of the Smart Grid. In 2010 he joined the board of directors of Evergreen Energy Inc., a US-based, publicly traded, green energy technology company.

A Dutch citizen, Guido Bartels earned an MBA in business economics from the University of Amsterdam.



Monday, October 4, 2010 • 14:00 – 14:30 • Room: Red Auditorium

Aneesh Chopra

**Chief Technology Officer
Assistant to the President
Associate Director for Technology
Office of Science & Technology Policy**

Biography: Aneesh Chopra is the Chief Technology Officer and in this role serves as an Assistant to the President and Associate Director for Technology within the Office of Science & Technology Policy. He works to advance the President's technology agenda by fostering new ideas and encouraging government-wide coordination to help the country meet its goals from job creation, to reducing health care costs, to protecting the homeland.

Aneesh was sworn in on May 22, 2009. Prior to his appointment, he served as the fourth Secretary of Technology for the Commonwealth of Virginia from January 2006 until April 2009. Prior to his appointment by then-Governor Timothy M. Kaine, he served as Managing Director with the Advisory Board Company, a publicly-traded healthcare think tank. Chopra was named to Government Technology magazine's Top 25 in their Doers, Dreamers, and Drivers issue in 2008. Aneesh Chopra received his B.A. from the Johns Hopkins University and his M.P.P. from Harvard's Kennedy School.



Tuesday, October 5, 2010 • 9:00 – 9:30 • Room: Red Auditorium

Phoebe L. Yang

**Senior Advisor to the Chairman on Broadband
Federal Communications Commission**

The National Broadband Plan: Driving Innovation and Investment in the Green Energy Economy

Biography: Ms. Yang is Senior Advisor to the Chairman on Broadband at the Federal Communications Commission, where she served as General Counsel of the Omnibus Broadband Initiative in creating Connecting America: The National Broadband Plan. Ms. Yang's prior experience includes executive roles at Discovery Communications, as Vice President of Corporate Strategy and Development, Vice President of Digital Media Operations and Strategy, and Director of International Business Development; and at AOL Time Warner as Vice

President of International Strategy and Policy focused on China. She served under President Bill Clinton as Special Coordinator for China Rule of Law. Earlier in her career, Ms. Yang practiced corporate and commercial law at Hogan & Hartson, LLP and was a law clerk to federal judge, The Honorable William Schwarzer (N.D., California).

Ms. Yang is a life member of the Council on Foreign Relations and has been a Fellow to Salzburg Seminar, Remarque Institute, and C. S. Lewis Institute; a French-American Foundation Young Leader; and an advisor to the Brookings China Center and Duke Election Law Reform Project. As a Rotary Scholar at the National University of Singapore, she earned certification in Mandarin Chinese. She has served in leadership roles for two Presidential campaigns.

Ms. Yang graduated Phi Beta Kappa with a B.A. in government and foreign affairs from the University of Virginia. She received her J.D. from Stanford Law School, where she was President and Editor-in-Chief of the Stanford Law Review.

KEYNOTE SPEAKERS



Tuesday, October 5, 2010 • 9:30 – 10:00 • Room: Red Auditorium

Emmanuel Darmois
Vice President of Corporate Standards
Alcatel-Lucent

Biography: Emmanuel Darmois has been working with Alcatel-Lucent since 1989. In his current position as VP Standards in Bell Labs, he overlooks standardization in Alcatel-Lucent, coordinates the standardization strategy and makes sure that the contributions of the several hundreds of Alcatel-Lucent engineers working in standards are reflecting this strategy and bear the highest technical value to the standardization community.

Prior to that, he has been taking different senior positions in operational business or in the field of Research and of R&D. He first headed research in Artificial Intelligence, Open Distributed Platforms, Service Creation. He has worked two years in the USA as Technical Director for the TINA Consortium, a standards making organization in the field of Service Creation. Back in Alcatel, he has been head of Corporate Research in Software, CTO of the Network Applications Division, VP R&D Effectiveness in charge of “overseeing the R&D Engine” of Alcatel and VP Unified Management Interaction in charge of the definition of a business strategy for Instant Real-Time Collaboration.

Before joining Alcatel-Lucent, he has been a Computer Science professor in “Ecole Nationale des Ponts et Chaussées”, a French School of Engineering, both as a teacher and a researcher in the field of Artificial Intelligence and Expert Systems. During that period, he also has created a start-up in the domain of network gaming.



Tuesday, October 5, 2010 • 14:00 – 14:30 • Room: Red Auditorium

Patricia A. Hoffman
Assistant Secretary
Office of Electricity Delivery and Energy Reliability

Biography: Patricia Hoffman was named Assistant Secretary (AS) for the Office of Electricity Delivery and Energy Reliability (OE) at the United States Department of Energy (DOE) in June 2010 after serving as Principal Deputy Assistant Secretary (PDAS) for OE since November 2007. Assistant Secretary Hoffman provides leadership on a national level on electric grid modernization, enhancing the security and reliability of the energy infrastructure and facilitating recovery from disruptions to the energy supply. This is critical to meeting the Nation’s growing demand for reliable electricity by overcoming the challenges of our Nation’s aging electricity transmission and distribution system and addressing the vulnerabilities in our energy supply chain.

During her tenure as PDAS, Ms. Hoffman oversaw OE’s \$4.5 billion in funding under the American Recovery and Reinvestment Act, to invest in the deployment of smart grid technologies to reduce electricity costs, increase reliability, and give consumers more choice and control over their energy use. Additionally, these Recovery Act funds support the long-term, coordinated transmission planning; the development of interoperability standards that will enable smart grid devices to communicate in an efficient and secure way; and workforce development support to enhance the electric power system workers skills essential to modernize the grid. The funds also provide assistance to state and local governments to improve planning and emergency preparedness to minimize impacts of energy supply disruptions, and provide additional resources to state public utility commissions to help in regulating and overseeing new electricity and energy projects.

Ms. Hoffman has over 14 years of experience at the Energy Department developing and managing technology research programs critical to the electric sector. She developed OE’s long-term research strategy and improved its management portfolio of research programs for modernizing and improving the resiliency of the electric grid. This included developing and implementing sensors and operational tools for wide-area monitoring, energy storage research and demonstration and the development of advanced conductors to increase the capacity and flexibility of the grid. She also initiated a new research effort focused on integrating and distributing renewable energy through the electric grid, such as promoting plug-in hybrid electric vehicles and implementing smart grid technologies to maintain system reliability. Additionally, under her leadership, the Department demonstrated the first recuperated, industrial gas turbine for distributed generation applications. She also briefly managed the business operations for OE, including human resources, budget development, financial execution, and performance management.

Ms. Hoffman holds a Bachelor of Science and a Master of Science in Ceramic Science and Engineering from Pennsylvania State University.

KEYNOTE SPEAKERS



Wednesday, October 6, 2010 • 9:00 – 9:30 • Room: Red Auditorium

Jeffrey D. Taft

Distinguished Engineer and Smart Grid Chief Architect, Smart Grid Business Unit

IEEE: Future History of Global Electric Networks

Abstract: The electricity infrastructure delivering power from a variety of generating sources to our homes, businesses and communities is not suitable for today's needs. The challenges that face our energy future simply cannot be met by our aging electric networks. Growing renewable energy capacity requirements, global climate change provisions, and the pressing need for more energy self-determination on behalf of customers all require a smarter, more intelligent grid. An intelligent grid incorporates networking technology to embed processing and communications into the power grid, enabling it to become more observable, controllable, automated, and integrated.

controllable, automated, and integrated.

Biography: As the Smart Grid Chief Architect, Jeff develops new architectures for Cisco smart grid product offerings, and ties them to product development, ecosystem elements and market strategies. He also participates in relevant standards activities and supports client teams on selected technical issues.

Jeff is a veteran of the energy and technology sectors with over 25 years experience in his field. He began working in the smart grid area in 2001 and has held smart grid chief architect roles with Accenture and IBM. Jeff formerly worked for Westinghouse and consulted for HICO and also has experience in industrial automation, medical imaging, signal processing, and control systems.

Jeff has extensive experience in the areas of smart grid analytics, visualization of grid information, and distributed architectures. He has worked on several key smart grid projects since he first began to develop sensor architectures and analytics for distribution grids, and then became involved in the larger issues of end-to-end smart grid data management.

Jeff received his PhD in Electrical Engineering from the University of Pittsburgh in 1986, with a dual specialization in digital signal processing and digital control. He is a member of the IEEE Power and Energy Society.



Wednesday, October 6, 2010 • 9:30 – 10:00 • Room: Red Auditorium

Tatsuo Yamamoto

Director-General for Technical Regulations, Standards and Conformity Assessment Policy, Ministry of Economy, Trade and Industry, Japan

Japan's Roadmap to international standardization for Smart Grid

Biography: Tatsuo Yamamoto is the Director-General for Technical Regulations, Standards and Conformity Assessment Policy Unit, Ministry of Economy, Trade and Industry (METI) of Japan. Mr. Yamamoto has worked in Defense Agency since 1983, renamed in 2007 as Ministry of Defense. He successively served a number of significant positions in various Bureaus of the Defense such as Coordination Officer, Cabinet Secretariat and Director. He has been devoted to public affairs, education and defense policy in the Ministry. Mr.

Yamamoto has been serving as the present position since 2009, and manages standardization, conformity assessment, measurement and intellectual infrastructure.



Wednesday, October 6, 2010 • 14:15 – 14:45 • Room: Red Auditorium

Vinton G. Cerf

Vice President and Chief Internet Evangelist
Google

Biography: Vinton G. Cerf is vice president and chief Internet evangelist for Google. Cerf is the former senior vice president of Technology Strategy for MCI. Widely known as one of the "Fathers of the Internet," Cerf is the co-designer of the TCP/IP protocols and the architecture of the Internet. In December 1997, Cerf and his colleague, Robert Kahn, received the U.S. National Medal of Technology. Kahn and Cerf received the ACM Alan M. Turing award in 2004 for their work. In November 2005, Cerf and Kahn were awarded the Presidential Medal of Freedom for their work. The medal is the highest civilian award given by the United States to its citizens.

From 1986-1994, Cerf was vice president of the Corporation for National Research Initiatives (CNRI). As vice president of MCI Digital Information Services from 1982-1986, he led the engineering of MCI Mail. During his tenure from 1976-1982 with the U.S. Department of Defense's Advanced Research Projects Agency (DARPA), Cerf played a key role leading the development of Internet and Internet-related packet data and security technologies. Vint Cerf served on the board of the Internet Corporation for Assigned Names and Numbers (ICANN) from 1999 and as chairman of the board from 2000-2007. Cerf served as founding president of the Internet Society from 1992-1995. In addition, Cerf is honorary chairman of the IPv6 Forum. Cerf served as a member of the U.S. Presidential Information Technology Advisory Committee (PITAC) from 1997 to 2001. Cerf sits on the Board of Directors for the Endowment for Excellence in Education and the board of the National Science & Technology Medals Foundation. He also serves as 1st Vice President and Treasurer of the National Science & Technology Medals Foundation. Cerf is a Fellow of the IEEE, ACM, and American Association for the Advancement of Science, the American Academy of Arts and Sciences, the International Engineering Consortium, the Computer History Museum, the Annenberg Center for Communications at USC and the National Academy of Engineering. Cerf also holds an appointment as distinguished visiting scientist at the Jet Propulsion Laboratory where he is working on the design of an interplanetary Internet.

TECHNICAL PROGRAM

Monday, October 4, 2010 • 10:50 – 12:30

Room: Red Auditorium

T-MM1: New Concepts for a Smarter Power Grid

Chair: Peter Sauer (University of Illinois, Urbana-Champaign, US)

Energy Management System and Pervasive Service-Oriented Networks

Guang-Hua Yang, Victor O. K. Li (University of Hong Kong, CN)

Distributed Power Balancing for the FREEDM System

Bruce McMillin, Mariesa Crow, Ravi C Akella, Derek Ditch, Fanjun Meng (Missouri University of Science and Technology, US)

Compressing Electrical Power Grids

Zhifang Wang (University of Illinois, Urbana-Champaign, US)

Anna Scaglione (University of California, Davis, US)

Robert Thomas (Cornell University, US)

High Assurance Smart Grid: Smart Grid Control Systems Communications Architecture

Thomas Overman (Boeing Energy, US)

Ronald Sackman (Boeing Defense, Space & Security, US)

Views on Service Oriented Architectures in the Context of Smart Grids

Sebastian Rohjans, Mathias Uslar, Ulrike Steffens, Matthias Postina (OFFIS, DE)

Monday, October 4, 2010 • 10:50 – 12:30

Room: Green Auditorium

T-MM2: Wide Area Monitoring and Control

Chairs: Gerald Fitzpatrick (NIST, US)

Mladen Kezunovic (Texas A&M, US)

James Thorp (Virginia Tech, US)

Calculation and Visualization of Power System Stability Margin Based on PMU Measurements

Michael Vaiman, Marianna Vaiman (V&R Energy Systems Research, Inc., US)

Slava Maslennikov, Eugene Litvinov, Xiaochuan Luo (ISO New England, US)

Delivery Requirements and Implementation Guidelines for the NASPInet Data Bus

David Bakken, Carl Hauser (Washington State University, US)

Harald Gjermundrod (University of Nicosia, CY)

Fault Detection and Localization in Smart Grid: A Probabilistic Dependence Graph Approach

Junshan Zhang, He Miao (Arizona State University, US)

The Deployment of a Smart Monitoring System using Wireless Sensors and Actuators Networks

Nicola Bressan, Leonardo Bazzaco, Nicola Bui, Paolo Casari,

Lorenzo Vangelista, Michele Zorzi (University of Padova, IT)

Ontology Matching Approach to the Harmonization of CIM and IEC 61850 Standards

Rafael Santodomingo, José Antonio Rodríguez-Mondéjar,

Miguel Ángel Sanz-Bobi (Comillas Pontifical University, ES)

Monday, October 4, 2010 • 10:50 – 12:30

Room: Employee Lounge

T-MM3: Distributed Generation and Renewables

Chair: Mischa Schwartz (Columbia University, US)

Facilitating a Generic Communication Interface to Distributed Energy Resources Mapping IEC 61850 to RESTful Services

Anders Pedersen, Einar Hauksson, Peter Andersen, Bjarne Poulsen,

Chresten Træholt (Technical University of Denmark, DK)

Dieter Gantenbein (IBM Zurich Research Laboratory, CH)

A Primary Evaluation for Applicability of IEC 62056 to A Next-Generation Power Grid

Tetsuo Otani (Central Research Institute of Electric Power Industry, JP)

Cascading Failures in Smart Grid - Benefits of Distributed Generation

Xian Chen, Hieu T Dinh, Bing Wang (University of Connecticut, US)

Local Control of Reactive Power by Distributed Photovoltaic Generators

Konstantin Turitsyn (Los Alamos National Laboratory, US)

Petr Sulc (New Mexico Consortium, US)

Scott Backhaus, Michael Chertkov (Los Alamos National Laboratory, US)

Impacts of Communication Delay on the Performance of a Control Scheme to Minimize Power Fluctuations Introduced by Renewable Generation under Varying V2G Vehicle Pool Size

Kithsiri Liyanage, Akihiko Yokoyama, Yutaka Ota, Tatsuhiro Nakajima, Haruhito Taniguchi (University of Tokyo, JP)

Monday, October 4, 2010 • 14:45 – 16:30

Room: Red Auditorium

T-MA1: Topics in Advanced Metering

Chair: Archan Misra (Telcordia Technologies, US)

WattDepot: An Open Source Software Ecosystem for Enterprise-scale Energy Data Collection, Storage, Analysis, and Visualization

Robert Brewer, Philip Johnson (University of Hawaii, Manoa, US)

Who controls the off switch?

Ross Anderson, Shailendra Fuloria (University of Cambridge, UK)

Leveraging Smart-Meters for Initiating Application Migration across Clouds for Performance and Power-Expenditure Trade-offs

Sumit Kumar Bose (Unisys, IN)

Michael Salsburg (Unisys, US)

Mohammad Firoj Mithani (Unisys, IN)

Dynamic Load Modeling of an HVAC Chiller for Demand Response Applications

Jonathan Berardino, Chika Nwankpa (Drexel University, US)

Compressed Meter Reading for Delay-Sensitive and Secure Load Report in Smart Grid

Husheng Li, Rukun Mao (University of Tennessee Knoxville, US)

Lifeng Lai (University of Arkansas, Little Rock, US)

Robert Caiming Qiu (Tennessee Tech University, US)

Monday, October 4, 2010 • 14:45 – 16:30

Room: Green Auditorium

T-MA2: Field Trials

Chairs: Skip Ashton (Ember, US)

Gary Stuebing (Duke Energy, US)

Modeling Power Transformers for the Design of SWER line Coupling Networks

Cornelis J. Kikkert (James Cook University, AU)

PRIME Interoperability Tests and Results from Field

Inigo Berganza, Alberto Sendin (Iberdrola, ES)

Aitor Arzuaga (ZIV, ES)

Manu Sharma (Current Technologies International, CH)

Badri Varadarajan (Texas Instruments, US)

Scalability of Smart Grid Protocols - Protocols And Their Simulative Evaluation For Massively Distributed DERs

Jörg Heuer, Richard Kuntschke, Martin Winter, Juergen Goetz,

Christian Glomb, Johannes Bergmann (Siemens AG, DE)

Substation Automated Data Analysis: Deployment Challenges

Mladen Kezunovic (Texas A&M University, US)

Tomo Popovic (TLI Inc., US)

Scott Sternfeld (FirstEnergy Corp., US)

Bruce Fardanesh (New York Power Authority, US)

Brian Clowe (CenterPoint Energy, US)

Paul Myrda (EPRI, US)

SmartGridLab: A Laboratory-Based Smart Grid Testbed

Gang Lu, Debraj De, WenZhan Song (Washington State University, US)

Monday, October 4, 2010 • 14:45 – 16:30
Room: Employee Lounge

T-MA3: Electric Vehicles

Chair: Onur Altintas (Toyota, Japan)

Architecture and Communication of an Electric Vehicle Virtual Power Plant

Bernhard Jansen, Carl Binding, Olle Sundstroem, Dieter Gantenbein
(IBM Zurich Research Laboratory, CH)

Assessment Framework of Plug-in Electric Vehicles Strategies

Aline Senart (Accenture, FR)
Scott Kurth (Accenture, US)
Gaëlle Le Roux (Accenture, FR)

Interconnections and Communications of Electric Vehicles and Smart Grid

Sebastian Käbisch (University of Passau, DE)
Schmitt Anton, Martin Winter, Jörg Heuer (Siemens AG, DE)

Smart Grid Charger for Electric Vehicles Using Existing Cellular Networks and SMS Text Messages

Clark Hochgraf, Rahul Tripathi, Spencer Herzberg
(Rochester Institute of Technology, US)

Locating PHEV Exchange Stations in V2G

Feng Pan, Russel Bent, David Izraelevitz, Alan Berscheid
(Los Alamos National Laboratory, US)

Monday, October 4, 2010 • 16:30 – 18:00
Room: Red Auditorium

International Standards Coordination

Since numerous countries have started or are planning to modernize their electrical grids and invest in smart grid programs, it is essential to leverage international standards to ensure cost effective and interoperable communications technology. In order to achieve this, international standards bodies need to work together in a coordinated way to drive the development of international standards to ensure coherence and avoid duplication. In the international arena, there are a number of standards development organizations (SDOs) that are involved with the development of smart grid communications standards including IEEE, ITU-T, IETF, ETSI, and others. Panelists will discuss perspectives on the communications standards needs of the Smart Grid and how their organizations are working together to provide solutions.

Moderator: George Arnold (NIST, US)

Panelists: Fred Baker (IETF, US)
Emanuel Darmais (ETSI, France)
Alex Gelman (IEEE, US)
Erich Gunther (Enernex, US)
Bilel Jamoussi (ITU-T, US)

Tuesday, October 5, 2010 • 10:30 – 12:30
Room: Red Auditorium

T-TM1: Control and Communication

Chair: Mardavij Roozbehani (MIT, US)

Spectral Analysis of Synchronization in a Lossless Structure-Preserving Power Network Model

Florian Dörfler, Francesco Bullo (University of California, Santa Barbara, US)

A Framework for Optimizing Measurement-based Power Distribution under Communication Network Constraints

Michael Kallitsis (North Carolina State University, US)
George Michailidis (University of Michigan, US)
Michael Devetsikiotis (North Carolina State University, US)

Communication Capacity Requirement for Reliable and Secure State Estimation in Smart Grid

Husheng Li (University of Tennessee, US)
Lifeng Lai (University of Arkansas, Little Rock, US)
Robert Caiming Qiu (Tennessee Tech University, US)

Control Over a Hybrid MAC Wireless Network

Jose Araujo (KTH, SE)
Yassine Ariba (Laas-cnrs, FR)
Pangun Park, Henrik Sandberg, Karl H. Johansson
(Royal Institute of Technology, SE)

Robust Broadcast-Communication Control of Electric Vehicle Charging

Konstantin Turitsyn, Nikolai Siniitsyn, Scott Backhaus, Michael Chertkov
(Los Alamos National Laboratory, US)

GERI - Bell Labs Smart Grid Research Focus: Economic Modeling, Networking, and Security & Privacy

Ken Budka, Jayant Deshpande, John D. Hobby, Young Jin Kim,
Vladimir Kolesnikov, Wonsuck Lee, Marina Thottan, Tom Reddington,
Christopher A White (Bell Labs, Alcatel-Lucent, US)
JungIn Choi, Junhee Hong, Jinho Kim, Wonsuk Ko, Young-Woo Nam
(Kyungwon University, Korea)

Tuesday, October 5, 2010 • 10:30 – 12:30

Room: Green Auditorium

T-TM2: False Data Injection and Privacy

Chair: Tim Polk (NIST, US)

Stealth Attacks and Protection Schemes for State Estimators in Power Systems

György Dán, Henrik Sandberg (KTH, Royal Institute of Technology, SE)

Malicious Data Attacks on Smart Grid State Estimation: Attack Strategies and Countermeasures

Oliver Kosut (Cornell University, US)
Liyan Jia (Tsinghua University, CN)
Robert Thomas, Lang Tong (Cornell University, US)

False Data Injection Attacks in Electricity Markets

Le Xie (Texas A&M University, US)
Yilin Mo, Bruno Sinopoli (Carnegie Mellon University, US)

Privacy for Smart Meters: Towards Undetectable Appliance Load Signatures

Georgios Kalogridis, Costas Efthymiou (Toshiba Research Europe Ltd, UK)
Stojan Denic (Toshiba/Bristol University, US)
Timothy Adrian Lewis, Rafael Cepeda (Toshiba Research Europe Ltd, UK)

Smart Grid Privacy via Anonymization of Smart Metering Data

Costas Efthymiou, Georgios Kalogridis (Toshiba Research Europe Ltd, UK)

Towards a Framework for Cyber Attack Impact Analysis of the Electric Smart Grid

Deepa Kundur, Xianyong Feng, Shan Liu, Takis Zourntos, Karen Butler-Purry
(Texas A&M University, US)

Tuesday, October 5, 2010 • 10:30 – 12:30

Room: Employee Lounge

T-TM3: Networking for the Smart Grid

Chairs: Anjan Bose (Washington State University, US)

David Culler (University of California, Berkeley, US)

Jean-Philippe Vasseur (Cisco, FR)

A Communication Stack over PLC for Multi Physical Layer IPv6 Networking

Cedric Chauvenet (CITI INSA-Lyon; INRIA, FR)
Pierre Emmanuel, Mathieu Pouillot (Watteco, FR)
Bernard Tourancheau (UMR LIP CNRS, ENS, INRIA; University Lyon1, FR)
Denis Genon-Catalot (Universite de Grenoble II, FR)

Agent Based Supervision of Zone 3 Relays to Prevent Hidden Failure Based Tripping

Shravan Garlapati, Hua Lin, Santhoshkumar Sambamoorthy,
Sandeep K. Shukla (Virginia Polytechnic and State University, US)
James Thorp (Virginia Tech, US)

Applicability Study of RPL with Local Repair in Smart Grid Substation Networks

Joydeep Tripathi, Jaudelice C. de Oliveira (Drexel University, US)
Jean-Philippe Vasseur (Cisco Systems, US)

Hydro: A Hybrid Routing Protocol for Low-Power and Lossy Networks

Stephen Dawson-Haggerty, Arsalan Tavakoli, David Culler (University of California, Berkeley, US)

Location Assisted Routing Techniques for Power Line Communication in Smart Grids

Mauro Biagi (Sapienza University of Rome, IT)
Lutz Lampe (University of British Columbia, CA)

Low Cost Wireless Sensor Network in Distributed Generation

Gargi Bag, Ki-Hyung Kim (Ajou University, KR)
Ritwik Majumder (ABB Corporate Research, SE)

Tuesday, October 5, 2010 • 14:45 – 16:45

Room: Red Auditorium

T-TA1: Architectures for Communication

Chair: Anna Scaglione (University of California, Davis, US)

A Comparative Study of Data Storage and Processing Architectures for the Smart Grid

María Arenas-Martínez, Sergio Herrero-Lopez Abel Sanchez, John Williams (Massachusetts Institute of Technology, US)
Paul Roth, Paul Hofmann (SAP Labs, US)
Alexander Zeier (University of Potsdam, DE)

Modeling Smart Grid Applications with Co-Simulation

Tim Godfrey, Craig Rodine (Electric Power Research Institute, US)
David Griffith (NIST, US)
Roger Dugan, Sara Mullen (Electric Power Research Institute, US)
Nada Golmie (NIST, US)

Cognitive Radio for Smart Grid Communications

Abolfazl Ghassemi, Sara Bavarian, Lutz Lampe (University of British Columbia, CA)

Power Line Communications and the Smart Grid

Stefano Galli (Panasonic, US)
Anna Scaglione (University of California, Davis, US)
Zhifang Wang (University of Illinois, Urbana-Champaign, US)

On Wireless Sensors Communication for Overhead Transmission Line

Monitoring in Power Delivery Systems
Ka Shun Hung, W. K. Lee, Victor O. K. Li, King-Shan Lui, Philip W. T. Pong, Kenneth K. Y. Wong, Guang-Hua Yang, Jin Zhong (University of Hong Kong, HK)

ICT Reference Architecture Design based on Requirements for Future Energy Grids

Christian Müller, Jens Schmutzler, Christian Wietfeld (Dortmund University of Technology, DE)
Steffen Fries, Alla Heidenreich, Hans-Joachim Hof (Siemens AG, DE)

Tuesday, October 5, 2010 • 14:45 – 16:45

Room: Green Auditorium

T-TA2: Secure Communication and Metering

Chair: David McGrew (Cisco, US)

A Zero-configuration Identity-based Signcryption Scheme for Smart Grid

Hayden K.-H. So, Sammy Kwok, Edmund Y. Lam, King-Shan Lui (University of Hong Kong, HK)

Secure Information Aggregation for Smart Grids Using Homomorphic Encryption

Fengjun Li (Pennsylvania State University, US)
Bo Luo (University of Kansas, US)
Peng Liu (Pennsylvania State University, US)

Secure Lossless Aggregation for Smart Grid M2M Networks

Andrea Bartoli, Juan Hernández-Serrano, Miguel Soriano, Mischa Dohler (Centre Tecnologic de Telecomunicacions de Catalunya, ES)
Apostolos Kountouris (France Telecom, FR)
Dominique Barthel (Orange Labs, FR)

Application-Aware Secure Multicast for Power Grid Communications

Jianqing Zhang, Carl A. Gunter (University of Illinois, Urbana-Champaign, US)

Redundant Metering for Integrity with Information-Theoretic Confidentiality

David Varodayan, Grace Gao (Stanford University, US)

Intrusion Detection for Advanced Metering Infrastructures: Requirements and Architectural Directions

Robin Berthier, William Sanders, Himanshu Khurana (University of Illinois, Urbana-Champaign, US)

Tuesday, October 5, 2010 • 14:45 – 16:45

Room: Employee Lounge

T-TA3: Smart Grid and Area Networks

Chairs: Nada Golmie (NIST, US)

Himanshu Khurana (University of Illinois, Urbana-Champaign, US)

A Methodology to Evaluate Wireless Technologies for the Smart Grid

Michael R. Souryal, Camillo Gentile, David Griffith, David Cypher, Nada Golmie (NIST, US)

Comparison of Different Coding Schemes for Powerline Communication Using Narrowband OFDM

Il Han Kim, Badri Varadarajan, Anand Dabak (Texas Instruments, US)

Coordination of Cloud Computing and Smart Power Grids

Amir-Hamed Mohsenian-Rad, Alberto Leon-Garcia (University of Toronto, CA)

Quality of Service Networking for Smart Grid Distribution Monitoring

Wei Sun, Jianping Wang (Hefei University of Technology, CN)
Dong Han, Xiaojing Yuan (University of Houston, US)
Chongwei Zhang (Hefei University of Technology, CN)

RF Mesh Systems for Smart Metering: System Architecture and Performance

Bill Lichtensteiger, Branko Bjelajac (Landis + Gyr AG, CH)
Christian Müller, Christian Wietfeld (Dortmund University of Technology, DE)

Dynamic Data Forwarding in Wireless Mesh Networks

Tadashige Iwao, Kenji Yamada, Masakazu Yura, Yuuta Nakaya (Fujitsu Limited, Japan)
Alvaro A. Cardenas, Sung Lee, Ryusuke Masuoka (Fujitsu Laboratories of America, Inc., USA)

Tuesday, October 5, 2010 • 17:00 – 18:30

Room: Red Auditorium

Smart Grid of the Future

The Smart Grid envisions an interconnected power distribution network that streamlines transmission, distribution, monitoring, and control of electricity. In the current vision, a smart meter will be connected to each household allowing consumers to not only draw power, but also supply surplus power to the grid. This could potentially produce millions of alternate micro energy sources. Such a grid would also allow improved load-balancing through instantaneous electricity demand information that would assist power plants to match their output to demand. High capacity storage devices for surplus power may be available so that large amounts of energy saved when demand is low can be released during peak periods. Based on the technology available today, the future smart grid can be envisioned as a massive complex network composed of interconnected power plants, electricity distribution infrastructure, and consumers. It is uncertain how this vision will be achieved and how or what innovations will shape the future. We not only have to contend with current demands and issues of the power grid, but must also consider future scenarios and resulting impacts (i.e. electric cars). Just like the Internet evolved over time with changes in communication technology,

TECHNICAL PROGRAM

protocol development, and novel applications, so will the Smart Grid. We must ensure that we learn from the past and not repeat the same mistakes. Unfettered communication across the grid has to be an essential component of the Smart Grid. Notwithstanding, there are many other questions that merit attention. Can we ensure Smart Grid's robustness and resilience? How would we control of the grid? Should it be self-organized or externally controlled? Should communication occur over existing power lines or should a parallel network be built? How will we ensure that inevitable anomalies in the grid will be corrected or isolated quickly? This panel of experts will show a glimpse into a crystal ball painting a vision for the future of Smart Grid.

Moderator: Sanjay Goel (University at Albany, SUNY, US)

Wednesday, October 6, 2010 • 10:30 – 12:30

Room: Red Auditorium

T-WM1: Pricing and Demand Response Models

Chair: Tina Tsou (Huawei, CN)

Incentive-based Energy Consumption Scheduling Algorithms for the Smart Grid

Stéphane Caron (Ecole Normale Supérieure, US)

George Kesidis (Pennsylvania State University, US)

On Two Market Models for Demand Response in Power Networks

Lijun Chen, Na Li, Steven Low, John Doyle

(California Institute of Technology, US)

Constructing Demand Response Models for Electric Power Consumption

John D. Hobby (Bell Labs, Alcatel-Lucent, US)

Residential Demand Response Using Reinforcement Learning

Daniel O'Neill, Marco Levorato, Andrea Goldsmith (Stanford University, US)

Urbashi Mitra (University of Southern California, US)

Optimal Real-time Pricing Algorithm Based on Utility Maximization for Smart Grid

Pedram Samadi (University of British Columbia, CA)

Amir-Hamed Mohsenian-Rad (University of Toronto, CA)

Robert Schober, Vincent Wong, Juri Jatskevich

(University of British Columbia, CA)

Minimizing the Electricity Bill of Cooperative Users under a Quasi-Dynamic Pricing Model

Safar Hatami, Massoud Pedram (University of Southern California, US)

Wednesday, October 6, 2010 • 10:30 – 12:30

Room: Green Auditorium

T-WM2: Demand-Side Management and Implementation

Chair: Michael Chertkov (Los Alamos National Laboratory, US)

In-home Power Distribution Systems by Circuit Switching and Power Packet Dispatching

Tsuguhiro Takuno, Megumi Koyama, Takashi Hikiyama (Kyoto University, JP)

Demand Side Load Management using a Three Step Optimization Methodology

Vincent Bakker, Maurice Bosman, Albert Molderink, Johann Hurink,

Gerard Smit (University of Twente, NL)

Power Demand Shifting with Smart Consumers

Anett Schuelke, Jochen Bauknecht, Johannes Häussler (NEC Europe Ltd., DE)

Control Mechanisms for Residential Electricity Demand in SmartGrids

Shalinee Kishore, Lawrence Snyder (Lehigh University, US)

Analytics and Transactive Control Design for the Pacific Northwest Smart Grid Demonstration Project

Mayank Sharma, Jayant Kalagnanam, Ramesh Natarajan, Pu Huang

(IBM T. J. Watson Research Center, US)

Ron Melton, Don Hammerstrom (Battelle Memorial Institute, US)

Ron Ambrosio (IBM Corporation, US)

Integrated Design and Implementation of Toronto's Smart Distribution Grid

Joshua Wong, Andrea Vargas, Ken Chadha, Arjun Devdas, Cheng Lin, Jigdel Kuyee (Toronto Hydro Electric System Limited, CA)

Wednesday, October 6, 2010 • 10:30 – 12:30

Room: Lecture Room A

T-WM3: Models for Service, Computation and Smart Grid Network Integration

Chair: Howard Choe (Raytheon, US)

Agent-oriented Designs for a Self Healing Smart Grid

Kendall E. Nygard, Prakash Ranganathan, Steve Bou Ghosn, Saeed Salem (North Dakota State University, US)

Jingpeng Tang (University of Minnesota Crookston, US)

Davin Loegering (North Dakota State University, US)

CIM, 61850, COSEM Standards used in a Model Driven Integration

Approach to Build the Smart Grid Service Oriented Architecture

Pascale Brédillet, Eric Lambert, Eric Schultz (EDF R&D, FR)

Design of Low-Carbon Electric and Communication Infrastructure

Susumu Yoneda (Softbank Telecom Corp., JP)

Ontology-based Resource Description and Discovery Framework for Low Carbon Grid Networks

Abdelhamid Daouadji (Ecole de Technologie Supérieure, CA)

Kim-Khoa Nguyen (Concordia University, CA)

Mathieu Lemay (Inocybe Technologies Inc., CA)

Cheriet Mohamed (Ecole de technologie supérieure, CA)

Smart Grid Data Cloud: A Model for Utilizing Cloud Computing in the Smart Grid Domain

Sebnem Rusitschka, Kolja Eger, Christoph Gerdes (Siemens AG, DE)

Smart High Voltage Substation based on IEC 61850 Process Bus and IEEE

1588 Time Synchronization Maciej Goraj (RuggedCom, ES)

Jim McGhee (RuggedCom, CA)

Wednesday, October 6, 2010 • 15:00 – 17:00

Room: Red Auditorium

T-WA1: Smart Grid Services for Demand Response

Chair: Sami Ayyorgun (Telcordia Technologies, US)

Distributed Demand Management in Smart Grid with a Congestion Game

Christian Ibars, Monica Navarro, Lorenza Giupponi

(Centre Tecnològic de Telecomunicacions de Catalunya, ES)

Demand Response Architecture- Integration into the Distribution Management System

Salman Mohagheghi, James Stoupis, Zhenyuan Wang, Zhao Li,

Hormoz Kazemzadeh (ABB Inc, US)

Use of Responsive Load to Supply Ancillary Services in the Smart Grid: Challenges and Approach

John Kueck (Oak Ridge National Laboratory, US)

Fangxing Li (University of Tennessee, US)

Aaron Snyder (Enernex Corporation, US)

Isabelle Snyder (Oak Ridge National Laboratory, US)

Load Participation in Electricity Markets: Day Ahead and Hour Ahead Market Coupling with Wholesale/Transmission and Retail/Distribution Cost and Congestion Modeling

Michael C. Caramanis, Justin Foster (Boston University, US)

Evgeniy Goldis (Charles River Associates International, US)

Incentive Design for Lowest Cost Aggregate Energy Demand Reduction

Soumyadip Ghosh, Jayant Kalagnanam, Dmitry Katz, Mark S. Squillante,

Xiaoxuan Zhang (IBM T.J. Watson Research Center, US)

Eugene Feinberg (Stony Brook University, US)

Efficient Energy Delivery Management for PHEVs

Mahdi Kefayati, Constantine Caramanis (University of Texas, Austin, US)

TECHNICAL PROGRAM

Wednesday, October 6, 2010 • 15:00 – 17:00

Room: Green Auditorium

T-WA2: Networks and Resource Allocation

Chair: Giuseppe Caire (University of Southern California, US)

Towards Cooperative Grids: Sensor/Actuator Networks for Promoting Renewables

Jay Taneja, David Culler (University of California, Berkeley, US)

Prabal K, Dutta (University of Michigan, US)

Coordination and Control of Distributed Energy Resources for Provision of Ancillary Services

Alejandro Dominguez-Garcia (University of Illinois, Urbana-Champaign, US)

Christoforos Hadjicostis (University of Cyprus, CY)

Dynamic Pricing and Stabilization of Supply and Demand in Modern Electric Power Grids

Mardavij Roozbehani, Munther Dahleh, Sanjoy Mitter (MIT, US)

Efficient Algorithms for Renewable Energy Allocation to Delay Tolerant Consumers

Michael J. Neely, Arash Saber Tehrani, Alex Dimakis

(University of Southern California, US)

On Efficient Use of Local Sources in Smart Grids with Power Quality Constraints

Daniele Forner, Tomaso Erseghe, Stefano Tomasin, Tenti Paolo

(University of Padova, IT)

The POWER of Networking: How Networking Can Help Power Management

Sedat Gormus, Parag Gopal Kulkarni, Zhong Fan

(Toshiba Research Europe, UK)

Wednesday, October 6, 2010 • 15:00 – 17:00

Room: Lecture Room A

T-WA3: Standards and Regulations

Chairs: Lutz Lampe (University of British Columbia, CA)

David Su (NIST, US)

A Unified Solution for Advanced Metering Infrastructure Integration with a Distribution Management System

Zhao Li, Zhenyuan Wang, Jean-Charles Tournier, William Peterson,

Wenping Li (ABB, US)

Yi Wang (Virginia Tech, US)

Embedding synchronism in SmartGrid with IEEE1588-based for Intelligent Electronics Devices

Víctor Pallarés-López, Antonio Moreno-Muñoz (University of Córdoba, ES)

Juan José González de la Rosa (University of Cadiz, ES)

Rafael Real-Calvo, Miguel Jesús González-Redondo

(University of Cordoba, ES)

Seamless Data Communication and Management over all Levels of the Power System

André Naumann (Otto-von-Guericke-University, DE)

Bernd Buchholz (NTB Technoservice, DE)

Przemyslaw Komarnicki (Fraunhofer IFF, DE)

Christoph Brunner (IT4Power, CH)

Spectrum for Smart Grid

Brett Kilbourne, Klaus Bender (Utilities Telecom Council, US)

Survey of Smart Grid Standardization Studies and Recommendations

Sebastian Rohjans, Mathias Uslar, Robert Bleiker, José González,

Michael Specht, Thomas Suding, Tobias Weidelt (OFFIS, DE)

Toward Digital Ecologies: Intelligent Agent Networks Controlling Interdependent Infrastructures

Valeriy Vyatkin, Gulnara Zhabelova (University of Auckland, NZ)

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Smart Grid and Area Networks (HAN, IAN, BAN, FAN and NAN)

Himanshu Khurana, University of Illinois, Urbana-Champaign, US
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Networking for Smart Grid

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Wide-Area Monitoring and Control

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Architectures and Models for the Smart Grid

Peter W. Sauer, University of Illinois, Urbana-Champaign, US
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Smart/Virtual Metering, Demand Response, Dynamic Pricing

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Standardization, Interoperability and Coexistence

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The Whole Picture: Sense, Communicate, Compute, Control

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Field Trials, Deployments, Lessons Learned

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Regulatory Issues and Their Impact on Communications Aspects

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2nd IEEE International Conference on Smart Grid Communications

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CALL FOR PAPERS

Developing the Smart Grid has become an urgent global priority, promising economic, environmental, and societal benefits. Information and communications technologies are at the core of the Smart Grid vision as they will empower today's power grid with the capability of supporting two-way energy and information flow, isolating and restoring power outages more quickly, facilitating the integration of renewable energy sources into the grid and empowering the consumer with tools for optimizing their energy consumption.

The 2nd IEEE International Conference on Smart Grid Communications (SmartGridComm) is centered on all communications aspects that are relevant to the Smart Grid and aims at bringing together researchers from Academia, Industry, and National Labs to exchange novel ideas, explore enabling technologies, discuss innovative designs, and share field trial experiences and lessons learnt.

Prospective authors are invited to submit original contributions (standard two-column IEEE format and up to 6 pages) on all aspects of Smart Grid Communications, including but not limited to:

- Architectures and Models for the Smart Grid
- Smart Grid network and service management
- Wide-Area Monitoring and Control (NASPInet, SCADA, DNP3, fault-detection and localization, sensing, etc.)
- The whole picture: Sense, Communicate, Compute, Control
- Communication networks for Smart Grid (IPv4/IPv6, ROLL, 6LoWPAN, wireless and wired Phy/MAC, HEMS, BACnet, etc.)
- Cyber and Physical Security and Privacy
- Smart/Virtual Metering, Demand Response, Dynamic Pricing
- Interconnections and Communications of Electric Vehicles and Smart Grids
- Virtual Power Plants, Distributed Generation, Microgrids, Renewables and Storage
- Standardization, Interoperability and Coexistence & Regulation
- Getting practical: Field trials, Deployments, and Lessons Learnt

IMPORTANT DATES

Paper Submission Deadline: April 4, 2011
Camera Ready Paper Due: July 11, 2011

Notification of Acceptance: June 27, 2011
Author Registration Deadline: July 11, 2011

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