SG-TEP

IEEE

International Conference on Smart Grid Technology, Economics and Policies (SG-TEP 2012)

Hilton Nuremberg, Germany, December 3-4, 2012

PROGRAM

IEEE International Conference on Smart Grid Technology, Economics and Policies (SG-TEP 2012)

Hilton Nuremberg, Germany, December 3-4, 2012

Venue:

Hilton Nuremberg
Valznerweiherstraße 200
D-90480 Nuremberg

Welcome Note from Chair of SG-TEP 2012

Dear Friends and Colleagues,

It is a big pleasure for me to welcome you to the SG-TEP 2012 International Conference on Smart Grid Technology, Economics and Policies in Nuremberg.
This year, the conference will be held for the first time. The scope of the conference is to provide an opportunity for academic researchers, industry and legal practitioners, and policy makers to network and discuss latest developments in Smart Grid and sustainable energy research. The conference focuses on the intersection of Smart Grid engineering, business opportunities, legal and policy issues. I warmly thank the different committees and teams for their efforts in making this event reality.

Looking forward to meeting you in Nuremberg at the SG-TEP 2012.

Wolf Ketter, Conferece Chair 2012 SG-TEP

Conference Chairman
Wolf Ketter, Erasmus University Rotterdam

Conference Opening by:

StS Katja Hessel MdL
State Secretary of the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology

IEEE 2012 International Conference on Smart Grid Technology, Economics and Policies (SG-TEP 2012)

Organizing Committee:

Conference Chair:

Wolf Ketter,
Erasmus University Rotterdam

Program Chair:

Ori Marom,
Erasmus University Rotterdam

Organizations Directors:

Karlheinz Ronge,
Fraunhofer Institute for Integrated Circuits, Erlangen

Robert Weigel,
University of Erlangen-Nuremberg (FAU)

Robert Klinski,
PATENTSHIP Patent Attorneys, Munich

Publications Chair:
Thomas Ussmueller, University of Erlangen-Nürnberg (FAU)

Exhibition Chair:
Georg Schmidt, GEROTRON COMMUNICATION

Organizing Institutions:

University of Erlangen-Nuremberg, Erlangen
Fraunhofer Institute for Integrated Circuits, Erlangen

Program Committee:

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Karlheinz Ronge, Fraunhofer Institute for Integrated Circuits, Erlangen
Andreas Symeonidis, University of Thessaloniki
Kim Talus, University of Eastern Finland (UEF)
Thomas Ussmueller, University of Erlangen-Nuremberg (FAU)
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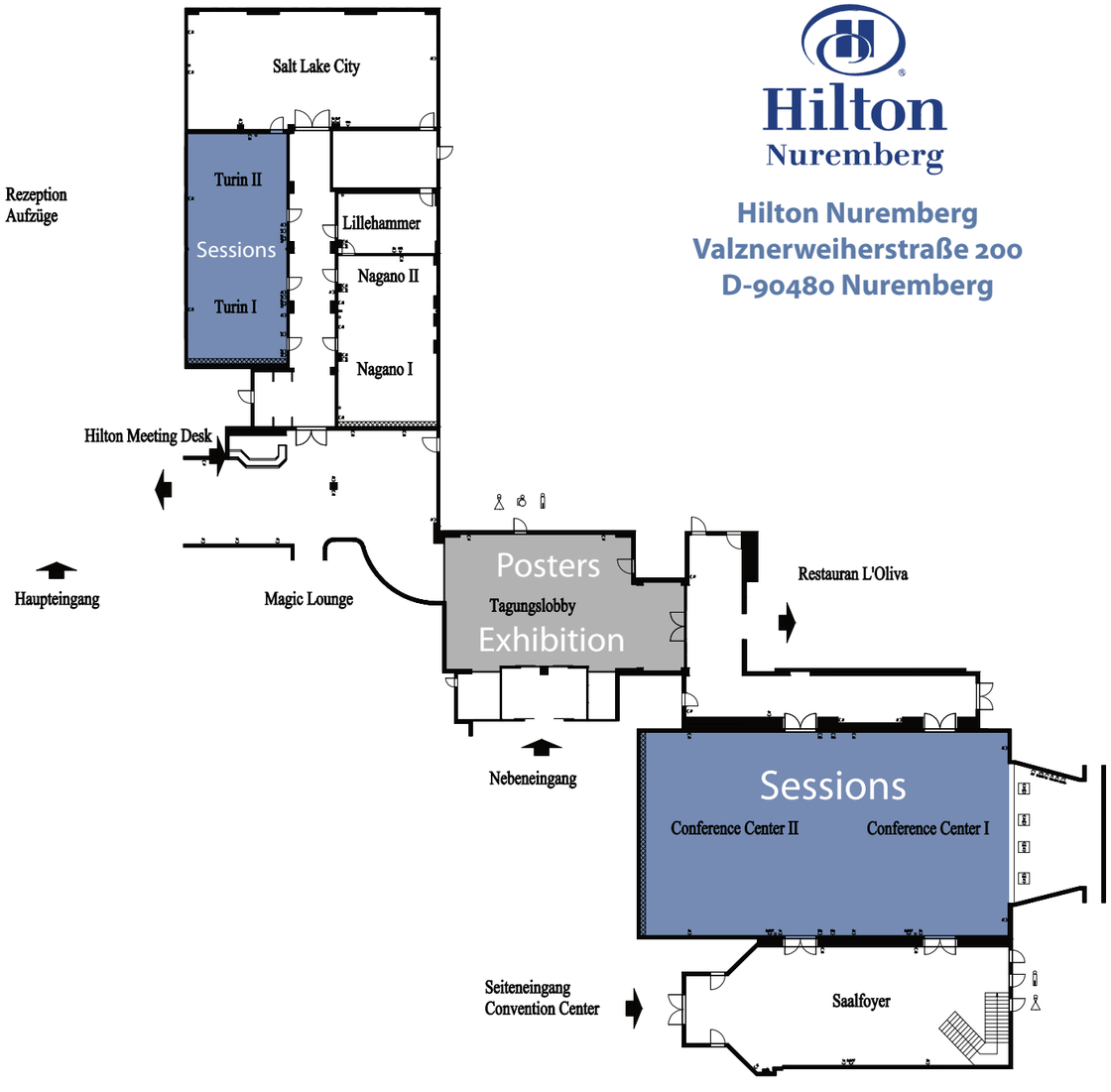
Location



Hilton Nuremberg

Hilton Nuremberg
Valznerweiherstraße 200
D-90480 Nuremberg

Scope of the Conference:

The annual Smart Grid Technology, Economics and Policies conference provides an opportunity for academic researchers, industry and legal practitioners, and policy makers to network and discuss latest developments in Smart Grid and sustainable energy research. The conference focuses on the intersection of Smart Grid engineering, business opportunities, legal and policy issues.

Sustainable energy systems of the future will need more than e cient, clean, low-cost, renewable energy sources; they will also need new incentive mechanisms and tactics that motivate sustainable energy consumption as well as a better real-time alignment of energy demand and supply. The development of new Smart Grid technologies will depend on public policies such as subsidies, patents and licenses, environmental and energy laws.

Our conference provides a uniquely broad interdisciplinary forum to discuss these issues. We invite paper submissions in all areas of energy, engineering, economics, management science research, energy policy and law; and specically encourage submissions related to the following areas:

Scope of the Conference:

- Demand response and demand side management (awareness and control)
- Dynamic pricing and revenue management
- Distributed energy resources
- Distributed control
- Distributed storage
- Environmental policy and law
- Emission reductions
- Finance
- Forecasting (loads and sources)
- Markets and economics
- Methods and algorithms for real-time analysis
- Microeconomics
- Optimization, placements and scheduling
- Optimal power flow
- Operations research
- Planning, operation and control
- Plug-in vehicles (G2V and V2G)
- Renewable energy
- Research methodology
- Smart Grid Standards
- Smart Markets
- Smart Metering
- Smart micro-grids
- Smart sensing, sense-making and situational awareness
- Technology
- Wide area monitoring, control and protection
- Visualizations for control centers
- Grid Security and Information Security Issues

Conference Registration:	Monday, December 3, 2012, 8.00 am - 4.00 pm Tuesday, December 4, 2012, 8.00 am - 4.00 pm
Conference Opening:	Monday, December 3, 2012, 9.00 am
Sessions:	Monday, December 3, 2012, 11.00 am - 6.45 pm Tuesday, December 4, 2012, 9.00 am - 3.00 pm
Table-top Exhibition Opening hours:	Monday, December 3, 2012, 9.00 am - 6.30 pm Tuesday, December 4, 2012, 9.00 am - 2.00 pm
Social Event:	Monday, December 3, 2012, 7.00 pm Conference Dinner at Hilton Hotel
We recommend:	Sunday afternoon/evening, December 2, 2012 "Christkindlesmarkt"

You can take part in a guided tour through the city following an excursion to the CHRISTKINDLESMARKT - as Nuremberg is known as "Christmas City - where the Christ Child is at home".

"Every year, Germany's most famous Christmas Market opens its stalls for visitors from all over the world, right in the middle of the city, on Nuremberg Main Market Square. At 5.30 p.m. on the Friday before the first Advent Sunday, the Christmas Angel opens her market, reciting the solemn prologue from the gallery of the church of Our Lady. And as every year, by Christmas Eve, more than two million visitors from all over the world will have sampled the delights of the Christmas Market…"

(Read more and register for a guided tour:
http://www.christkindlesmarkt.de)

IEEE 2012 International Conference on Smart Grid Technology, Economics and Policies (SG-TEP 2012)

Agenda

Monday, December 3, 2012			
09.00 - 10.30	Opening Session		
10.30 - 11.00	Coffee Break at Exhibition		
11.00 - 12.30	Session 1A Smart Grid Technologies	Session 1B Energy Policy, Law and Regulation	Session 1C Energy Economics
12.30 - 13.30	Lunch at Exhibition		
13.30 - 14.45	Plenary Session - Keynote		
14.45 - 15.15	Coffee break at Exhibition		
15.15 - 16.45	Session 2A Smart Metering	Session 2B Intelectual Property and Standards I	Session 2C Oranization & Operations Management
15.15 - 16.45	Poster Session		
16.45 - 17.15	Coffee Break at Exhibition		
17.15 - 18.45	Session 3A Communication & Sensors	Session 3B Intelectual Property and Standards II	Session 3C Smart Grid Informatics
19.00 - 21.45	Conference Dinner		

Tuesday, December 4, 2012			
09.00 - 10.30	Session 4A Energy Efficiency I	Session 4B Future Household Energy Management	Session 4C Power Trading Agent Competition
10.30 - 11.00	Coffee Break at Exhibition		
11.00 - 12.30	Session 5A Energy Efficiency II	Session 5B Electric Vehicles and Storage	Session 5C Demand Response & Simulation
12.30 - 13.30	Lunch at Exhibition		
13.30	Plenary Session - Panel Discussion		
	Closing		

IEEE 2012 International Conference on Smart Grid Technology, Economics and Policies (SG-TEP 2012)

Program: Monday, Dec. 3, 2012

09.00 - 10.30

Opening Session — Session chair: W. Ketter

09.00 **Welcome**
W. Ketter;
Erasmus University Rotterdam, Rotterdam, Netherlands

09.05 **Opening**
K. Hessel;
State Secretary of the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, Germany

K. Hessel,
State Secretary of the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology

09.25 M. Fraas;
Head of Economic Department, City of Nuremberg, Nuremberg, Germany

09.30 **Smart Grid as a Base for Smart Energy Markets**
L. Karg;
B.A.U.M. Consult, Munich, Germany

11:00 – 12:30

Parallel Session 1A – Smart Grid Technologies — Session chair: C. Oerter

11.00 **A New Type of Automatic Bus Transfer Equipment with Function of Ring Current Protection**
Y. Chen[1], X. Gong[2], H. Li[1];
[1] Electrical Power Research Center Beijing Electrical Power Corporation, Beijing, China;
[2] Law School Beijing Institute of Technology, Beijing, China

11.30 **Photovoltaic Output Power Improvement Applying DC-DC Converters on Submodule Level**
S. Strache, J. Mueller, R. Wunderlich, S. Heinen;
IAS RWTH Aachen University, Aachen, Germany

12.00 **First Practical Experience with Smart Low Voltage Grids**
N. Neusel-Lange, C. Oerter, M. Zdrallek;
Wuppertal University, Wuppertal, Germany

Parallel Session 1B – Energy Policy, Law and Regulation — Session chair: S. Wirsing

11.00 **Energy and Communications Access Networks – Bridging the Divide – Approaches for Policy Intervention**
S. Wirsing[1], W. Reichl[1], M. Ehrler[1], H. Malleck[2];
[1] SBR Juconomy Consulting AG, Vienna, Austria;
[2] Graz University of Technology, Institute of Electrical Power Systems, Graz, Austria

11.30 **Accounting Instruments of Governance**
N. Domingues;
ISEL, Lisbon, Portugal

12.00 **Assessing Open Source Software Usage in the Development of Grid Control and Measurement Device Software** (invited)
O. Block;
Patentanwaltskanzlei Dr. O. Block, Berlin, Germany

Parallel Session 1C – Energy Economics — Session chair: C. Bollino

11. 00 **Estimating Cost Function Using Observed Bid Data in Italian Wholesale Electricity Market** (invited)
C. A. Bollino, P. Polinori;
University of Perugia, Perugia, Italy

11.30 **Inside the Innovation Process: Energy R&D Expenditures & Patents** (invited)
R. Bointner;
Vienna University of Technology, Vienna, Austria

12.00 **The Impact of Framing on Consumer Selection of Energy Tariffs**
E. Verhagen[1], L. Rook[2], J. van Dalen[1], W. Ketter[1];
[1] Erasmus University Rotterdam, Rotterdam, Netherlands;
[2] Technical University Delft, Delft, Netherlands

13.30 – 14.45

Plenary Session - Keynote — Session chair: W. Ketter

13.30 **Smart Markets for a Smart Electricity Grid** (invited)
S. S. Oren;
University of California at Berkeley, Berkeley, USA

15:15 – 16:45

Parallel Session 2A – Smart Metering — Session chair: P. Koponen

15.15 **The Neverending Story of the Smart Metering Technology – What Needs To Be Done For a Happy End?**
J. Kranz[1], B. Roemer[2], A. Picot[2];
[1] University of Goettingen, Goettingen, Germany;
[2] Ludwig-Maximilians-University, Munich, Germany

15.35 **Short-Term Load Forecasting Model Based on Smart Metering Data**
P. Koponen;
VTT Technical Research Centre of Finland, Espoo, Finnland

15.55 **Spectrum Aware Interference Modeling in Large-Scale Smart Metering Networks**
F. Beer[1], H. Lieske[1], A. Heuberger[1], G. Kilian[2], H. Petkov[2];
[1] Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany
[2] Fraunhofer Institute for Integrated Circuits, Erlangen, Germany

16.15 **Implementation of a Protocol for Secure Distributed Aggregation of Smart Metering Data**
C. Rottondi[1], G. Verticale[1], C. Krauß[2];
[1] Politecnico di Milano, Milan, Italy
[2] Fraunhofer Research Institution AISEC, Garching, Germany

Parallel Session 2B – Intellectual Property and Standards I

Session chair: O. Baldus

15.15 **The Role of Economic Principles and Intellectual Property Rights in Smart Grid Implementation**
O. Baldus[1], C. Heckmann[2];
[1] PATENTSHIP Law Firm, Munich, Germany
[2] University of Strasbourg, Strasbourg, France

15.45 **Exploitation of Intellectual Property from Research for Smart Grid Technologies and Applications** (invited)
C. Schamper;
Fraunhofer-Gesellschaft, Germany

16.15 **Telecommunication aspects of Smart Grid Standardisation** (invited)
K. Hemberger;
Bundesnetzagentur, Mainz, Germany

Parallel Session 2C – Organization and Operations Management

Session chair: C. Daenekas

15.15 **Transitioning from the Traditional to the Smart Grid: Lessons Learned From Closed-loop Supply Chains**
A. Richter, E. van der Laan, W. Ketter, K. Valogianni;
Erasmus University Rotterdam, Rotterdam, Netherlands

15.45 **Smart Grid: Extending the Value Chain by Evaluation of Key Performance Indicators** (invited)
D. Olschewski;
Cleopa GmbH, Berlin, Germany

16.15 **An Approach to Smart Grid Related Enterprise Architecture Development**
J. Trefke, C. Daenekas;
OFFIS e.V., Oldenburg, Germany

17:15 – 18:45

Parallel Session 3A – Communication and Sensors

Session chair: A. Valenzuela

17.15 **Robust Power Supply for Wireless Sensors Using the Electrostatic Field of Parts under High Voltage**
T. Keutel, T. Motl, C. Viehweger, O. Kanoun;
Chemnitz University of Technology, Chemnitz, Germany

17.40 **Multisensor System for Energy Consumption Awareness in Large Buildings**
A. Valenzuela;
Bonn-Rhein-Sieg University of Applied Sciences, Sankt Augustin, Germany

18.05 **Design Considerations of Wireless Monitoring Networks for Concentrated Photovoltaic Power Plant Applications**
W. Wang, V. Cionca, D. O'Mahony, N. Wang, M. Hayes, B. O'Flynn, C. O'Mathuna;
Tyndall National Institute, Cork City, Ireland

Parallel Session 3B – Intellectual Property and Standards II

Session chair: B. Huber

17.15 **Research and Development Collaborations – Focus on Ownership and Use of Results** (invited)
B. Huber;
IP*SEVA, Backnang, Germany

17.55 **Smart Grids Patents: Ownership and Technology Trends**
Giulio Ceccarini;
European Patent Office, Munich, Germany

Parallel Session 3C – Smart Grid Informatics

Session chair: M. Wagner

17.15 **Putting the ‚Smarts' into the Smart Grid: A Grand Challenge for Multi-Agent Systems** (invited)
S. Ramchurn;
University of Southampton, Southampton, England

17.40 **Understanding the Assimilation of Smart Grid Technologies in German Distribution Grid Operators: An Empirical Study**
J. Kossahl, J. Kanz, L. Kolbe;
University of Goettingen, Goettingen, Germany

18.05 **Smart Grid Cyber Security: A German Perspective**
M. Wagner, M. Kuba, A. Oeder;
Fraunhofer Institute for Integrated Circuits, Erlangen, Germany

Program: Tuesday, Dec. 4, 2012

9:00 – 10:30

Parallel Session 4A – Energy Efficiency I

Session chair: M. Ajmone Marsan

09.00 **The FP7 Network of Excellence on Green Networking** (invited)
M. Ajmone Marsan;
Politecnico di Torino, Torino, Italy

09.30 **Analysis of Energy Efficiency Metrics in Data Centres**
J. Costa-Requena, C. Ferrater, J. Manner, M. Peuhkuri;
Aalto University, Espoo, Finland

10.00 I**ntegrated IC solutions for Power Measurement in Smart Grid Applications** (invited)
F. Ohnhauser;
eesy-ic GmbH, Nuremberg, Germany

Parallel Session 4B – Future Household Energy Management

Session chair: G. Kleineidam

09.00 **Smart Grid Requirements and Expectations from a Future Home Perspective**
J. Franke[1], G. Kleineidam[1], B. Ehmann[2]:
[1] Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany
[2] Ulm, Germany

09.30 **Distributed Model Predictive Control for Thermal House Comfort with Auction of Available Energy**
F. A. Barata[1], R. Neves-Silva[2];
[1] ADESPA Instituto Superior de Engenharia de Lisboa (ISEL), Lisboa, Portugal;
[2] DEE-FCT Universidade Nova de Lisboa, Caparica, Portugal

10.00 **Exploiting Day-Ahead Electricity Price for Maximized Profit of Photovoltaic Systems**
A. Awad, P.Bazan, R. German;
Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany

Parallel Session 4C – The Power Trading Agent Competition

Session chair: W. Ketter

09.00 **An Introduction and Demo Session**
W. Ketter;
Erasmus University Rotterdam, Rotterdam, Netherlands

11:00 – 12:30

Parallel Session 5A – Energy Efficiency II

Session chair: W. Nebel

11.00 **Datacenters – Energy Hogs or Helping to Optimize Energy Consumption**
M. Peuhkuri, R. Lääkkölä, J. Costa-Requena, J. Manner;
Aalto University, Espoo, Finland

11.30 **Holistic Power Management of Distributed Data Centers** (Invited)
K. Schröder, W. Nebel:
Carl von Ossietzky University of Oldenburg, Oldenburg, Germany

12.00 **Deriving Business Requirements from Technology Roadmaps to support ICT-Architecture Management**
C. Daenekas;
OFFIS e.V., Oldenburg, Germany

Parallel Session 5B – Electric Vehicles and Storage

Session chair: D. Zhdanov

11.00 **Electric Vehicles: Policy and Research Implications**
D. Zhdanov;
University of Connecticut, Connecticut, USA

11.30 **The Idea of a Modular Multilevel Converter with Integrated Batteries**
M. Schroeder, J. Jaeger;
Friedrich-Alexander-University of Erlangen-Nuremberg, Erlangen, Germany

12.00 **A Profitable Business Model for Electric Vehicle Fleet Owners**
M. Kahlen, K. Valogianni, W. Ketter, J. van Dalen;
Erasmus University Rotterdam, Rotterdam, Netherlands

Parallel Session 5C – Demand Response and Simulation

Session chair: C. Derksen

11.00 **Demand Response - A Different Form of Distributed Storage?**
P. Grunewald, J. Torriti;
University of Reading, Reading, England

11.30 **A Framework for the Implementation of Large Scale Demand Response**
G. Andreou[1], A. Symeonidis[1], C. Diou[2], D. Labridis[1], P. Mitkas[1];
[1] Aristotle University of Thessaloniki, Thessaloniki , Greece
[2] Center for Research and Technology Hellas, Thessaloniki, Greece

12.00 **An Advanced Agent-based Simulation Toolbox for the Comprehensive Simulation of Future Energy Networks**
C. Derksen, R. Unland;
University of Duisburg-Essen, Essen, Germany

11:00 – 12:30

Plenary Session

Session chair: W. Ketter

13.30 **Panel Discussion: Transforming Energy Business**

Moderator: W. Ketter;
Erasmus University Rotterdam, Rotterdam, Netherlands

Guests: S. S. Oren;
University of California at Berkeley, Berkeley, USA

K. Ronge;
Fraunhofer Institute for Integrated Circuits, Erlangen, Germany

R. Oonk

Exhibitors:

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