



**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, Conference 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

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

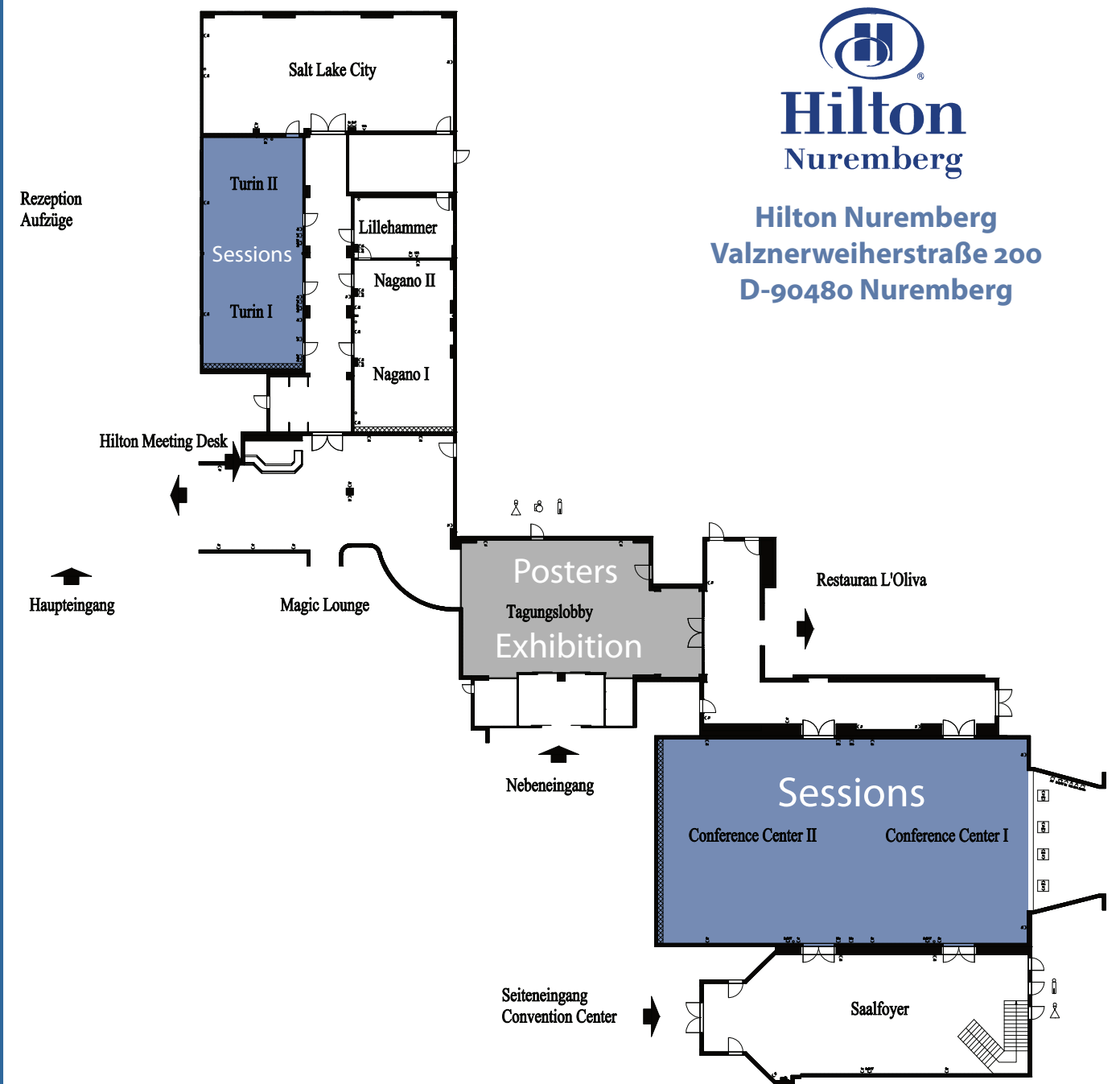
Program Committee:

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Giorgos Andreou, University of Thessaloniki
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Dirk Westermann, University of Technology Ilmenau
Markus Zanker, University Klagenfurt

Supported by



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 efficient, 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 specifically 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>)



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 Intellectual Property and Standards I	Session 2C Oranization & Operations Management
15.15 - 16.45	Poster Session		
16.45 - 17.15	Coffee Break at Exhibition		
17.45 - 18.45	Session 3A Communication & Sensors	Session 3B Intellectual 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		

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
- 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



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

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. Chen¹, X. Gong², H. Li¹;
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. Wirsing¹, W. Reichl¹, M. Ehrler¹, H. Malleck²;
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. Verhagen¹, L. Rook², J. van Dalen¹, W. Ketter¹;
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. Kranz¹, B. Roemer², A. Picot²;
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, Finland
- 15.55 **Spectrum Aware Interference Modeling in Large-Scale Smart Metering Networks**
F. Beer¹, H. Lieske¹, A. Heuberger¹, G. Kilian², H. Petkov²;
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. Rottondi¹, G. Verticale¹, C. Krauß²;
¹ Politecnico di Milano, Milan, Italy
² Fraunhofer Research Institution AISEC, Garching, Germany

- 15.15 **The Role of Economic Principles and Intellectual Property Rights in Smart Grid Implementation**
O. Baldus¹, C. Heckmann²;
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

- 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

- 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

- 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

- 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**

- 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 **Integrated IC solutions for Power Measurement in Smart Grid Applications** (invited)
F. Ohnhausner;
eesy-ic GmbH, Nuremberg, Germany

- 09.00 **Smart Grid Requirements and Expectations from a Future Home Perspective**
J. Franke¹, G. Kleineidam¹, B. Ehmman²;
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. Barata¹, R. Neves-Silva²;
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

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

11:00 – 12:30

- 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

- 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

- 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. Andreou¹, A. Symeonidis¹, C. Diou², D. Labridis¹, P. Mitkas¹;
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

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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