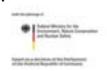


IRED 2012

Integration of Renewable Energy and Distributed Energy Resources

Transforming the Power System: Challenges & Solutions

MARITIM proArte Hotel Berlin Berlin, Germany December 4th-6th, 2012





Veranstaltungsort



Berlin – The capital of Germany is a cosmopolitan city of culture, politics, media and science. Berlin is a major European hub and one of the most visited cities on the continent.

Berlin is an exciting city of contrasts. Forever evolving it can be explored in a countless variety of historical and modern attractions. Berlin has over 170 museums, making the city one of the world's prime locations for first-rate historical art collections, cultural exhibitions as well as museums of science and technology.

Conference Chair

Dr. Philipp Strauss

Division Director Systems Engineering and Grid Integration Fraunhofer IWES / DERlab e. V., Kassel, Germany

Conference Co-Chair

Dr. Abraham Ellis

Sandia National Laboratories, Albuquerque, New Mexico, USA

Masaaki Yamamoto

Director General, Smart Community Department, New Energy and Industrial Technology Development Organization (NEDO), Kawasaki City, Japan

Conference Focus

- · Share status and results of research projects
- Learn from national programs and policies
- Stimulate international, national, and regional program coordination
- Better understand and communicate the visions from various stakeholders and players

Scientific Committee

Régine Belhomme

Electricité de France, Clamart Cedex, France

Britta Buchholz

ABB AG, Mannheim, Germany

Eng Kiat Chan

Energy Market Authority, Singapore, Singapore

Chun-Yu Chen

Industrial Technology Research Institute, Taiwan

Kerstin Deller

German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Berlin, Germany

Lisa Dignard-Bailey

Natural Resources Canada, Varennes. Canada

Johan Driesen

Katholieke Universiteit Leuven, Heverlee, Belgium

Hubert Fechner

University AS Technikum Wien, Vienna, Austria

Grahame Foulger

Smart Grid Partners, Brisbane, Australia

Nikos Hatziargyriou

Public Power Corporation S.A., Athens, Greece

Reza Iravani

University of Toronto, Toronto, Canada

Masayuki Kamimoto

National Institute of Advanced Industrial Science and Technology, Aomori, Japan

Ludwig Karg

B.A.U.M. Consult GmbH, München, Germany

Thomas S. Kev

Electric Power Research Institute, Knoxville, TN, USA

S. A. Khaparde

Indian Institute of Technology, Mumbai, India

Benjamin Kroposki

National Renewable Energy Laboratory, Golden, CO, USA

Andreas Lugmaier

Nationale Technologieplattform Smart Grids Austria / Siemens AG, Wien, Austria

René Marklein

Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany

Luciano Martini

Ricerca sul Sistema Energetico Spa., Milano, Italy

Jens Merten

Commissariat à l'Energie Atomique, Institut National de l'Energie Solaire, Le Bourget Du Lac, France

Satoshi Morozumi

New Energy and Industrial Technology Development Organization (NEDO), Kawasaki City, Japan

John Eli Nielsen

Technical University of Denmark, Lyngby, Denmark

Yoshiro Owadano

National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

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Sacramento Municipal Utility District, Sacramento, CA, USA

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Tampere University of Technology, Tampere, Finland

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Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany

Frieder Schmitt

MVV Energie AG, Mannheim, Germany

Atul Shah

Suzlon Infrastructure Services Limited, Pune, India

Sindhu Suresh

Siemens Corporate Research, Princeton, NJ, USA

Kazuyuki Takada

New Energy and Industrial Technology Development Organization (NEDO), Kawasaki City, Japan

Dan Ton

U.S. Department of Energy, Washington, USA

Patrick Van Hove

European Commission, Brussels, Belgium

Message from the Conference Chairs



Dr. Philipp Strauss Chairman



Dr. Abraham EllisCo-Chairman



Masaaki Yamamoto Co-Chairman

The growing share of renewable and distributed energy resources in power systems requires the development of efficient measures for their integration. Since the first International Conference on Integration of Renewable and Distributed Energy Resources that took place in Brussels 2004, grid integration technology has continuously improved. Many technical and nontechnical issues have been solved or are now better understood. However, as the scale of deployment increases, new important challenges are emerging.

In the last few years, the topic of new smart grid approaches that support the efficient grid integration of small generators, storage units and controllable loads has gained considerably higher attention. A number of deployment projects including large-scale field demonstrations have been conducted in many countries. This conference will offer the opportunity to learn about these projects and to discuss results with the partners involved.

Like at the previous events, the latest technical, market and policy aspects related to integration of renewable and distributed energy resources and smart grids will be discussed in plenary sessions. It is the intention of the conference to support the interdisciplinary discussion among different stakeholders promote lasting collaboration among key players from all over the world. Conference side events like workshops, and committee meetings on standardization and other related topics that will take place before and after the conference will give attendees the opportunity to further develop and deepen the knowledge in special topics.

We would be very happy to welcome you at the 5^{th} Conference on Integration that will take place during the first week of December 2012 in Berlin, Germany.

Dr. Philipp Strauss, Fraunhofer IWES, Kassel, Germany
Dr. Abraham Ellis, Sandia National Laboratories, Albuquerque,
New Mexico, USA
Masaaki Yamamoto, NEDO, Kawasaki City, Japan

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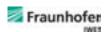


































Tuesday, 4th December 2012

08.30 Conference Opening and Welcome Remarks
Philipp Strauss, Division Director Systems Engineering and Grid
Integration Fraunhofer IWES / DERlab e. V., Kassel, Germany

SESSION 1: POLICIES AND PROGRAMS

Policies and programs implemented at the national and international levels are guiding the transformation of the electric power grid toward smart grid concepts and higher share of renewable generation. This session will provide an updated overview of significant policies and programs worldwide, which are driving research, development, demonstration and deployment activities that will be presented during the course of the conference.

- Chair: Abraham Ellis, Sandia National Laboratories, Albuquerque, USA Masaaki Yamamoto, NEDO, Kawasaki City, Japan Philipp Strauss Fraunhofer IWES / DERlab e. V., Kassel, Germany
- 08.40 Transformation of the Energy System in Germany: Adapting to High Shares of Renewable Energy
 Berthold Goeke, Deputy Director General, Head of Directorate KI III "Renewable Energies" German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Berlin, Germany
- 09.00 The European Strategic Energy Technologies Plan: Developing and Deploying Low Carbon Technologies to Support Europe's Energy-Climate Policies
 Rudolf Strohmeier, Head of Cabinet of the Information Society and Media Commissioner, European Commission, Brussels, Belgium
- 09.20 Programs and Policies Promoting the Deployment of Distributed Energy Resources in the U.S.
 Patricia A. Hoffman, Assistant Secretary, United States Department of Energy, Washington, USA
- 09.40 Japanese Energy Policy and Grid Integration
 Masaaki Yamamoto, Smart Community Department, New Energy
 and Industrial Technology, Development Organization (NEDO),
 Kawasaki City, Japan
- 10.00 Discussion
- 10.20 Coffee Break and visit to the Exhibition
- 11.00 Australia's Clean Energy Initiatives
 David Green, Chief Executive, Clean Energy Council, Southbank,
 Australia
- 11.20 The Coordinated Research Program on Smart Grids of the European Energy Research Alliance
 Luciano Martini, T&D Technologies Department, RSE SpAIEA-ISGAN, Milan, Italy
- 11.40 Coordinating Planning and Exploitation of Research and Demonstration Projects Through the European Electricity Grids Initiative
 Patrick Van Hove, European Commission Directorate General for Research and Innovation, Brussels, Belgium

- 12.00 Renewable Energy and Smart Grid Programs in China tbd.
- 12.20 Discussion
- 12.40 Lunch and visit to the Exhibition

SESSION 2: REPORTING ON RESULTS OF LARGE PROJECT PORTFOLIOS

In many countries, the policy context has enhanced pilot projects that show possible solutions for a secure and sustainable energy system with a high share of renewable and distributed generation. Project teams have developed solutions, proven concepts and studied interaction of different market players. Challenges vary widely from country to country depending on the existing grid infrastructure as well as on local regulatory and market environments. Learning from each other 's experiences is key to success for this unprecedented transformation process for our energy system. Goal of this session is to learn about best practices in different regions with their specific challenges. Presentations will include the aspects of integrating wind, PV, CHP and storage mainly on distribution systems. The panelists will show results from projects that are in their final stages, and will discuss the near-term outlook of on-going projects.

- Chair: Britta Buchholz, ABB AG, Mannheim, Germany
 Thomas S. Key, Electric Power Research Institute, Knoxville, USA
- 14.00 Smart Country: successful integration of distributed generation in rural areas
 Andreas Breuer, RWE Deutschland AG, Essen, Germany
- 14.20 U.S. SunShot Initiative and Portfolio of Solar Integration Research and Development Projects
 Kevin Lynn, Solar Systems Integration, U.S. Department of Energy, Washington, USA
- 14.40 International Smart Grid Demonstration Initiative: Four-Year
 Update on Lessons Learned
 Matt Wakefield. Electric Power Research Institute. Palo Alto. USA
- 15.00 Japan's Smart Community Activities Satoshi Morozumi, Director for Smart Community Department, NEDO, Kawasaki, Japan
- 15.20 Discussion
- 15.40 Coffee Break and visit to the Exhibition
- 16.25 Smart Energy made in Germany: Results of German Smart Grid Research and Implementation Program E-Energy Ludwig Karg, B.A.U.M. Consult GmbH, Head of E-Energy Ancillary Research, Munich, Germany
- 17.05 PV in Italy and Integration Challenges for ENEL Gianluca Gigliucci, Enel Ingegneria e Ricerca S.p.A, Pisa, Italy
- 17.25 Experiences from Latin America tbd.
- 17.45 Discussion

POSTER SESSION A AND GET TOGETHER SPONSORED BY

This event features selected papers on the subject of Renewables Integration and Smart Grid. The session starts with short oral presentations or "Elevator Talks" by poster authors, followed by the poster and trade exhibition. This "Get Together" event provides an opportunity for networking.

Chair: René Marklein, Fraunhofer-IWES, Kassel, Germany Reza Iravani, University of Toronto, Toronto, Canada Atul Shah, Suzlon Infrastucture Services Ltd., Pune, India

18.00 Elevator Talks

18.45 Visit to the Exhibition Get Together

21.00 End of 1st Conference Day

Wednesday, 5th December 2012

SESSION 3: FIRST OF A KIND ACHIEVEMENTS IN TECHNOLOGY, SYSTEMS INTEGRATION, MODELING AND SIMULATION

With the recent acceleration in the deployment of renewable energy generation worldwide, the large-scale integration of renewable resources in electricity grids is now supported by an increasing number of full-scale, first-of-a-kind implementation and research around the world. These achievements are formulating possible solutions to grid integration challenges posed by high share of renewable electricity.

- Chair: Patrick Van Hove, European Commission, Brussels, Belgium David Green, Clean Energy Council, Southbank, Australia
- 08.30 Large-Scale Integration of Renewable Energy
 Jochen Kreusel, ABB AG, Head of Global Program Smart Grids,
 Mannheim, Germany
- 08.50 Grid Integration of Large Scale PV Plants:

 A Global Challenge with Local Requirements

 Jürgen Reekers, SMA Technologies AG, Niestetal, Germany
- 09.10 How Renewable Energy Forecasting Make the Smart Grid Smarter:
 Advances in Solar and Wind Forecasting with Application to the
 Pacific Northwest Smart Grid Demonstration Project
 Pascal Storck, Department of Civil and Environmental Engineering, University of Washington, Seattle, Washington, USA

- 09.30 MetaPV: Building PV-Powered Smart Grids in the Real World Achim Woyte, R&D Manager, 3E SA, Brussels, Belgium
- 09.50 Discussion
- 10.10 Coffee Break and visit to the Exhibition
- 10.50 Integration of Solar and Wind energy into Electricity Grids and Energy Markets by Energy Forecasts
 Thomas Landgraf, Enercast GmbH, Kassel, Germany
- 11.10 Solar Mobility: Two Years of Practical Experience Charging 10 Cars With Solar Energy
 Jens Merten, Program Manager, CEA INES, Le Bourget Du Lac, France
- 11.30 Implementation of Active Demand in the ADDRESS Project:
 From Concepts to Field Tests
 Régine Belhomme, EDF R&D, Clamart Cedex, France
- 11.50 Active Grid Management in Medium and Low Voltage Grids:
 Results from Austrian Demonstration Projects
 Alfred Einfalt, Siemens AG Austria, Wien, Austria
- 12.10 Discussion
- 12.30 Lunch and visit to the Exhibition

SESSION 4A: LEARNING FROM ISLAND SYSTEMS SOLUTIONS

Smart grid systems with renewable generation established on islands serve as a model for the integration of high shares of clean energy into future electricity systems. Island grids provide an opportunity to investigate solutions to grid management and control, security-related matters, as well as business models. Lessons learned from these experiences will significantly contribute to the deployment of smart grid solution for mainland grids.

Chair: Hubert Fechner, University AS Technikum Wien, Vienna, Austria

- 14.00 The Millener Project: 1500 Household Installations in French Insular Electric Systems, Aggregated for Grid Support Jean-Christian Marcel, TENESOL S.A., La Tour de Salvagny, France
- 14.20 US Japan Collaborative Smart Grid Demonstration Project on Maui Island Rick Rocheleau, Hawaii Natural Energy Institute, University of
 - Hawaii, Hawaii Natural Energy Institute, University of Hawaii, Hawaii
- 14.40 Smart Grid on the Greek Islands Nikos Hatziargyriou, Public Power Corporation S.A., Athens, Greece
- 15.00 Discussion
- 15 15 Coffee Break and visit to the Exhibition

SESSION 4B: ADVANCED TRANSMISSION AND DISTRIBUTION SYSTEM OPERATIONS

Balancing future energy systems will require a more sophisticated interaction between the major electricity players within and across jurisdictions as supply and demand profiles become increasingly dynamic. How will system operators, utilities, generators and governments influence the transition toward managing more complex and more efficient systems?

Chair: Lisa Dignard-Bailey, Natural Resources Canada, Varennes, Canada

Eng Kiat Chan, Energy Market Authority, Singapore, Singapore

16.00 PowerShift Atlantic: Regional Collaboration for Wind Integration with Load Control
Michel Losier, Program Director of PowerShift Atlantic, NB
Power Corporation, New Brunswick, Canada

- 16.20 Supply-Demand Balance in a Changing World: The System Operator Challenge Mark O'Malley, Electricity Research Centre, University College Dublin, Dublin, Ireland
- 16.40 Offshore Wind Integration and Operation Peter Børre Eriksen, Head of Systems Analysis, Energinet, Fredericia, Denmark
- 17.00 TSO Best Practices: A Perspective from India
 Sushil Kumar Soonee, CEO of Power system Operation Corporation of India, New Delhi, India
- 17.20 Discussion
- 17.40 Break

POSTER SESSION B

This event features selected papers on the subject of Renewables Integration and Smart Grid. The session starts with short oral presentations or "Elevator Talks" by poster authors, followed by the poster exhibition.

Chair: René Marklein, Fraunhofer-IWES, Kassel, Germany Reza Iravani, University of Toronto, Toronto, Canada Atul Shah, Suzlon Infrastucture Services Ltd., Pune, India

- 18.00 Flevator Talks
- 19 00 Visit to the Exhibition
- 19.30 End of 2nd Conference Day
- 20.00 Dinner and Poster Award Ceremony

Thursday, 6th December 2012

SESSION 5: HARMONIZATION OF GRID CODES AND TESTING STANDARDS

The large-scale deployment of Renewable and Distributed Energy Sources in the future power networks requires standardization of grid interface requirements as well as testing procedures that are used for certification and performance characterization of components and systems. This session will explore the status and evolution of grid codes and test procedures. It will also describe current efforts toward harmonization of standards.

Chair: Nikos Hatziargyriou, Public Power Corporation S.A., Athens, Greece

Dan Ton, U.S. Department of Energy, Washington, USA

- 08.30 Communications Interoperability Standards and Harmonization
 Dan Ton, U.S. Department of Energy, Washington, USA
 Nikos Hatziargyriou, Public Power Corporation S.A., Athens, Greece
- 08.50 Smart Grid Testbed in Korea: Addressing Standardisation Needs
- 09.10 International Harmonization Smart Grid Testing: ISGAN-APEC Activities
 - Russel Conklin, U.S. Department of Energy, Washington, USA
- 09.30 System Approach of the European Smart Grid Coordination Group of CEN, CENELEC and ETSI: Update of the German Smart Grid Standardization Roadmap Johannes Stein, DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE, Frankfurt am
- 09.50 Discussion

Main, Germany

10.10 Coffee Break and visit to the Exhibition

SESSION 6: FUTURE SCENARIOS WITH VERY HIGH SHARES OF RENEWABLE ENERGY

Some regions and countries are planning for a majority of their energy to come from renewable sources. How will the electrical system operate under extremely high renewable penetrations? How will renewables interact with other generation sources? This session will examine what future energy systems will look like, and will discuss the potential challenges and solutions.

Chair: Benjamin Kroposki, National Renewable Energy Laboratory, Golden, USA

Kazuyuki Takada, NEDO, Kawasaki City, Japan

- 10.55 German Government's Scenario to Supply 80% of Power Consumption by Renewable Energy in 2050 Kurt Rohrig, Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany
- 11.15 Ontario Long-Term Energy Plan Ken Nakahara, Ministry of Energy, Ontario, Canada

- 11.35 Ancillary Services from Wind Turbines and Related Grid Codes Eckard Quitmann, ENERCON GmbH, Bremen, Germany
- 11.55 TWENTIES: Solutions for the Integration of Large Renewable Energy Resources in the Power System Jose-Luis Mata, Red Eléctrica de España, S.A.U., Madrid, Spain
- 12.15 Discussion
- 12.35 Lunch and visit to the Exhibition
- 14.00 Mobility: A Driver for Power-to-Gas Technology Reinhard Otten, Audi AG, Ingolstadt, Germany
- 14.20 Japan's New Energy Policy
 Takanori Tomura, Director General, Smart Community Department, NEDO, Kawasaki City, Japan
- 14.40 Stochastic Optimization of Power Systems Planning and Operations in Future Scenarios with High Share of Renewables Jean-Paul Watson, Sandia National Laboratories, Albuquerque, USA
- 15.00 US Renewable Futures Study: Achieving 80% of Electricity from Renewables
 tbd., National Renewable Energy Laboratory, Golden, CO, USA
- 15.20 Discussion

CLOSING SESSION

This session will provide a summary of the conference topics and closing remarks. Session chairs will engage in a round table discussion to identify key conclusions, salient results, critical gaps, and promising future efforts.

Chair: Abraham Ellis, Sandia National Laboratories, Albuquerque, USA

15.40 Round Table: Summary of Key Outcomes of the Conference

Report from Session Chairs:

- Abraham Ellis, Sandia National Laboratories, Albuquerque, USA
- Masaaki Yamamoto, NEDO, Kawasaki City, Japan
- Philipp Strauss, Division Director Systems Engineering and Grid Integration Fraunhofer IWES / DERlab e. V., Kassel, Germany
- · Britta Buchholz, ABB AG, Mannheim, Germany
- Thomas S. Key, Electric Power Research Institute, USA
- René Marklein, Fraunhofer Institute for Wind Energy and Energy System Technology, Kassel, Germany
- Reza Iravani, University of Toronto, Toronto, Canada
- Atul Shah, Suzlon Infrastucture Services Ltd., Pune, India
- · Hubert Fechner, University AS Technikum Wien, Vienna, Austria
- · David Green, Clean Energy Council, Southbank, Australia
- Lisa Dignard-Bailey, Natural Resources Canada, Varennes, Canada
- · Eng Kiat Chan, Energy Market Authority, Singapore, Singapore
- Benjamin Kroposki, National Renewable Energy Laboratory, Golden, USA
- Kazuyuki Takada, NEDO, Kawasaki City, Japan
- Nikos Hatziargyriou, Public Power Corporation S.A., Athens, Greece
- Dan Ton, U.S. Department of Energy, Washington, USA

16.20 Announcement of the next IRED conference in Japan and Closing Remarks

Masaaki Yamamoto, NEDO, Kawasaki City, Japan Philipp Strauss, Fraunhofer-IWES, Kassel, Germany

16 30 End of the Conference

Pre- & Post Workshops

Further information could be found under: http://www.conference-on-integration-2012.com/

Workshops - closed:

PV-GRID:

"Working Groups Meeting"

BSW premises, Berlin, Germany December 3rd, 2012, 11:30 – 17:00

STARGRID:

"Definition of stakeholders' requirements and evaluation criteria for the SG related standardization activities"

Maritim proArte Hotel Berlin, Berlin, Germany December 4th, 2012 11:30 – 17:00

• ETP SG Secretariat:

"Standardization needs on DER Smart Grid integration" (tbc.)

• SIRFN/ISGAN:

"Testing procedures for grid connection of inverters" (tbc.)

Project Meetings:

DERri General Meeting

Fraunhofer premises, Berlin, Germany December $3^{\rm rd}$ - December $4^{\rm th}$, 2012 8:00 - 17:00 both days

Organisation

Only online registration available. To register for the conference please vistit:

http://www.conference-on-integration-2012.com/registration.html

Online registration open until November 26th, 2012

Conference Fee

Reduced fee for

Presenters: € 600,00

Reduced fee for

Poster-Presenters: € 600.00

Employees of Universities

and public authorities € 650,00

If registered before 31.10.2012

Per Person (3 days): € 820,00

If registered after 31.10.2012

Per Person (3 days): € 970,00 Daily fee: € 550.00

Fees cover admission to all sessions, invitation to all coffee breaks, lunches, dinner and the conference proceedings.

Accommodation

We recommend to arrange your hotel booking as soon as possible by yourself.

A room contingent is set aside under the headword "OTTI" at the conference venue MARITIM proArte Hotel Berlin.

A booking form could be found under:

http://www.conference-on-integration-2012.com/info/ accommodation-hotel-booking.html

as well as an onlinebooking possibility or please directly contact the MARITIM proArte Hotel Berlin.

Bookings should be made before November 6th, 2012.

Conference Management

Bernd Porzelius Britta Haseneder

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Conditions of participation and cancellation (Online Registration)

You will receive your registration documents with receipt of your registration. The participation fee is VAT-exempt and due net with receipt of the invoice. Please transfer the invoice amount not later than 14 days before the conference starts. Otherwise a copy of the transfer order must be presented at the conference desk. All bank charges have to be covered by the transmitter. Entrance to the conference can only be permitted if OTTI has received the payment. OTTI reserves the right to make modification and amendments of any kind for urgent reasons. In the case of a cancellation a service fee of € 120 will be charged. In the event of cancellations made later than 15 days before the conference, or in the case of absenteeism, the total participation fee will be charged, unless you are able to provide evidence of a deviating amount of damages or expenses. The cancellation must be in written form. The person representing the contracting party may be replaced at any time but a written notice is necessary not later than 4 days before the conference starts. Irrespective of legal basis, OTTI shall only be liable for property damage and pecuniary loss which occurred due to intent or gross negligence. The place of fulfilment and jurisdiction is Regensburg, Germany.

Official Conference Homepage

Further information could be found on the official homepage under:

http://www.conference-on-integration-2012.com



Timetable

5th International Conference on Integration of Renewable Energy and Distributed Energy Resources

