

IEEE

Berlin

Europe

Innovative

Smart Grid

Technologies

October 14 – 17, 2012 2012 3rd IEEE PES

Innovative Smart Grid Technologies Europe (ISGT Europe)

Berlin, Germany

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GEFÖRDERT DURCH



Bundesministerium für Wirtschaft und Technologie

1 Welcome to IEEE PES ISGT Europe 2012



Dear Colleague,

On behalf of IEEE and the Organization Committee, we are very pleased to welcome you to the Innovative Smart Grid Technologies (ISGT) Europe 2012. This is the third conference in a series that was initiated by IEEE Power and Energy Society (PES) in 2010 in Gothenburg and then moved to Manchester in 2011. This year we are delighted to see you here in Berlin on the campus of Berlin University of Technology (TU Berlin).

The ISGT Europe 2012 comes at a moment where the power and energy industry undergoes a profound process of change. In such a time of critical decisions, how do we make the right ones? How do we find the win-win-win for sustainability-reliabilityeconomy? As a conference, ISGT Europe 2012 cannot have the single one solution for all problems. But this conference has the critical and vital role of paving the way forward to the best Smart Grid solution.

More than 450 contributions from over 50 countries were submitted to the conference. This is very exciting: progress in the industry relies on innovative ideas and international discussion. The contributions made range from active voltage control and smart homes in distribution networks to technologies for gridfriendly integration of large off-shore wind parks. Contributions range from national electric vehicle projects in Japan, energy management systems in China, smart distribution networks and microgrids in Europe to cyber security solutions in the USA.

While the program is packed and dense, it also looks beyond technology. The WIE Women in Engineering event illustrates the important roles of women in creating the Smart Grid. The evening reception in Charlottenburg Palace and the dinner in the industrial monument of Postbahnhof support the networking. The Festival of Lights in parallel with the conference will add to the unique Berlin flavor.

The very important role of the ISGT Europe has also been recognized in industry. We would like to thank our Platinum Supporter China Power International New Energy Holding Ltd. (CPINE), Gold



Supporter Vattenfall, Silver Supporters 50Hertz, ABB, Alstom, Netzgesellschaft Berlin-Brandenburg, and Bronze Supporters Digsilent, ILF Consulting Engineers, and Technologiestiftung Berlin, as well as our exhibitors. We are very grateful for this strong a commitment from our supporters who helped us enormously in offering such a high-quality program. We are equally grateful to all the many persons from the organization and technical program committees and partnering associations that made ISGT Europe 2012 possible.

Thank you for being part of IEEE PES ISGT Europe 2012. With your participation you help moving the Smart Grid forward. We wish you an excellent stay in Berlin.

Yours sincerely,

Kai Strunz, Professor TU Berlin and General Chair of IEEE PES ISGT Europe 2012

2 Committees

GENERAL & TECHNICAL	Kai Strunz	TECHNICAL PROGRAM	Lina Bertling Tjernberg, Chalmers University of Technology, Sweden
PROGRAM CHAIR	TU Berlin	COMMITTEE	Janusz Bialek, University of Durham, UK
			Eilyan Bitar, Comell University, USA
			Saša Z. Djokić, University of Edinburgh, UK
			Johan Driesen, KU Leuven, Belgium
HONORARY CO-CHAIR	Li Xiaolin		Janaka Ekanayake, Cardiff University, UK
OF ORGANIZATION	China Power International New Energy		István Erlich, University of Duisburg-Essen, Germany
			Wilfried Fischer, 50Hertz, Germany
			Feng Gao, IBM, China
			Rodrigo Garcia-Valle, Technical University of Denmark, Denmark
LOCAL	Maren Kuschke		Lalit Kumar Goel, Nanyang Technological University, Singapore
ORGANIZATION CHAIR	TU Berlin		Nouredine Hadjsaid, INP Grenoble, France
			Nikos Hatziargyriou, National Technical University of Athens, Greece
			Jerry Heydt, Arizona State University, USA
			Yunhe Hou, University of Hong Kong, Hong Kong
TREASURER	Susanne Landt		Gabriela Hug, Carnegie Mellon University, USA
	TenneT TSO		Daniel Kirschen, University of Washington, USA
			Chen-Ching Liu, Washington State University, USA, and UCD, Ireland
			Juan A. Martinez Velasco, Universitat Politecnica de Catalunya, Spain
			Jovica Milanovic, University of Manchester, UK
IEEE PES ISGT	Noel Schulz		Hiroyuki Mori, Meiji University, Japan
COMMITTEE	IEEE PES President		Viktoria Neimane, Vattenfall, Sweden
	Alan Rotz		Lars Nordström, KTH Stockholm, Sweden
	IEEE PES Past President		Carlo Alberto Nucci, University of Bologna, Italy
	Pat Ryan		Jacob Østergaard, Technical University of Denmark, Denmark
	IEEE PES Executive Director		Mario Paolone, EPFL, Switzerland
	Mohammad Shahidehpour		João A. Peças Lopes, INESC Porto, Portugal
	Chair IEEE PES ISGT 2012 USA		Ram Rajagopal, Stanford University, USA
	Meliha Selak		Christian Rehtanz, TU Dortmund, Germany
	IEEE PES VP Chapters		Paulo F. Ribeiro, Eindhoven University of Technology, Netherlands
	Costas Vournas		Zbigniew Styczynski, Otto-von-Guericke University Magdeburg, Germany
	IEEE PES Region 8 Representative		Hongbin Sun, Tsinghua University, China
	Lina Bertling Tjernberg		Dirk Westermann, TU Ilmenau, Germany
	IEEE PES ISGT Europe Site Committee Chair		Felix Wu, University of Hong Kong, Hong Kong
			Akihiko Yokoyama, University of Tokyo, Japan
			Xiaoping Zhang, University of Birmingham, UK

3 Conference Venue

The IEEE PES ISGT Europe 2012 conference is hosted by Technische Universität Berlin (TU Berlin).



The conference facilities are situated in the main building of the campus of TU Berlin in Charlottenburg. The facilities extend over three floors. When entering the main building at the main entrance from Straße des 17. Juni, the **registration and information desks** are on the left of level 0. At the registration area, **wardrobe** and main restrooms are located. Further restrooms are marked by signposts on each floor. From the registration area, stairs directly lead to the conference facilities on level 1. Alternatively, elevators in the side wings of the building may be used to access levels 1 and 2.

The **conference sessions** take place in six lecture halls, highlighted in the floor maps. This includes the Main Theaters H 0105 on Monday and Tuesday, and H 0104 on Wednesday. Both Main Theaters can be accessed on level 0 and on level 1. Further lecture halls are H 0107, H 0110, H 0111, and H 0112 on level 0, as well as H 1058 on level 1.

On the way from the atrium to the lecture hall H 1058, the **industry exhibition** is found. It is located in between the Main Theaters H 0104 and H 0105. At the entrance to the exhibition area, there is one of three **catering areas**, where coffee and lunch are served. The other two catering areas are located at the atrium and at the gallery of the atrium on level 2. A **seating area** is provided at the atrium and the room nearby as well as in the rooms at the gallery on level 2. The **conference office** is located near the seating area on level 2.



4 Conference Program Elements

The conference program covers a variety of technical sessions. Specific information on each session is provided in the section on program details from page 17. Further important elements are the industry exhibition, student activities, the women in engineering meeting, and the evening events. A description is given below.

4.1 Technical Sessions

PLENARYAt the opening and closing of the conference, there are plenary
sessions, which stand out in that no other sessions are scheduledPANELin parallel. The formal opening session starts on Monday, October
15, at 8:45 h in the Main Theater H 0105. The closing session
takes place on Wednesday, October 17, at 17:30 h in the otherPRESENTATIONMain Theater H 0104.

- PAPER FORUM Directly after the opening session, the plenary session "Smart Grid Perspectives and Solutions" begins. This is followed by panel, paper TUTORIAL presentation and paper forum sessions. In **14 panel sessions**, re
 - cognized experts offer invited talks on topics of key present interest. In **35 paper presentation and 6 paper forum sessions**, the papers submitted to the conference and selected by the Technical Program Committees are presented.

Each **paper presentation** session typically counts about six presentations. Each of the six presentations takes up to 12 to 14 minutes, and additional 3 to 5 minutes for each presentation are reserved for questions. In **paper forum** sessions with 12 to 15 papers, each presenter first gives a short impulse talk of about 3 to 4 minutes on the core of the contribution. Then, individual discussions between presenters and the audience follow at poster boards.

In the **tutorial sessions** fundamental issues are taught and discussed in detail. The tutorials start on Sunday, October 14, and are also offered on Monday and Wednesday. Tutorials are included in he IEEE student member registration. For other ticket types, tutorials can be booked optionally.

4.2 Industry Exhibition

At the industry exhibition between the Main Theaters H 0104 and H 0105 on level 1, participants can get in touch with industry partners and stakeholders, exchange ideas and discuss products, services, and collaboration. Information on exhibitors is offered in sections 7 and 8.

Exhibition opening hours are given in the following.

 Monday, October 15
 09:30 h - 17:00 h

 Tuesday, October 16
 09:30 h - 17:00 h

 Wednesday, October 17
 09:30 h - 16:00 h

4.3 IEEE Student Program

The Student Program of IEEE PES ISGT Europe 2012 covers free attendance of tutorials, a technical site visit on Sunday, and the Informal Reception. At the Informal Reception on Sunday, October 14, students that do not already have presentations scheduled in the technical sessions are invited to display posters.

4.4 IEEE GOLD Activities

The Informal Reception includes a presentation of IEEE's GOLD (Graduates of the Last Decade) activities. The presentation is held by Prof. Henry Louie of Seattle University and will start at 18:30 h.

4.5 IEEE Women in Engineering

The Women in Engineering (WIE) event features talks in a session dedicated to careers in the power and energy sector. The WIE session is on Tuesday, October 16, at lunch time.

4 Conference Program Elements (continued)

4.6 Conference Evening Events

- INFORMALThe Informal Reception of the Student and GOLD Programs is
at the atrium in the main building of TU Berlin on Sunday, October
14, from 18:00 h to 19:30 h. This reception is an opportunity for
students to network. It is an opportunity for all other participants
coming for tutorials, registration or interested in meeting students
and friends to come for a first exchange.
- WELCOME The **Welcome Reception** takes place at the Orangery of RECEPTION Charlottenburg Palace on Monday, October 15, from 19:00 h until 21:30 h.

The Orangery is situated within a 30 minutes walking distance from the TU Berlin campus. Bus M45 runs from Ernst-Reuter-Platz or Zoologischer Garten (in direction Spandau, Johannesstift) to Charlottenburg Palace (Schloss Charlottenburg).

We would like to thank Vattenfall for supporting the Welcome Reception.



The **Conference Dinner** takes place at historic Postbahnhof on Tuesday, October 16, from 19:30 h to 23 h. The heritage Postbahnhof, a former post office and terminal train station for postal services, is located close to the Berlin Wall. Nowadays, it serves as a well-known event location. Remains of the Berlin Wall, the widely known East Side Gallery, may be visited individually nearby.



Postbahnhof may be reached by taking one of the eastbound S-Bahn trains from Tiergarten or Zoologischer Garten (S5, S7 or S75 in direction Strausberg, Ahrensfelde or Wartenberg)

EAST SIDE GALLERY

to Ostbahnhof. Leaving the station in driving direction (eastwards) and crossing the adjacent street leads to the front of the Postbahnhof building. The entrance is on the right side.

We would like to thank China Power International New Energy for supporting the Conference Dinner.





GROSSE ORANGERIE Schloss Charlottenburg Spandauer Damm 22 – 24 14059 Berlin

5 Information for Presenters

Please prepare your presentation in *.ppt, *.pptx or *.pdf formats and have it ready on a USB memory stick. Presentation files are named according to the following format: Paper ID followed by underscore followed by presenter last name followed by underscore followed by two representative words of the title separated by dash. Thus, the file names look as follows: 2012ISGTEU-xxx_Name_Two-Words. Only use the English alphabet A – Z. For panel presentations, the paper ID is omitted.

Presenters in **paper presentation sessions** are requested to upload their presentations in the respective lecture hall in the break at the latest 20 minutes prior to the start of the session. Due to the larger number of papers, presenters in **paper forum sessions** are asked to begin with uploads of the short impulse presentations at least 30 minutes before the start of the session. In addition, presenters in a paper forum should set up their poster at the poster



board prior to the session. Posters need to be removed by the presenters afterwards. Please note that posters and other material will not be sent to you after the conference. Posters not removed at the given time will be discarded. Presenters in panel sessions should send their presentation to the session chair prior to the conference.

Laptops are available in each lecture room and equipped with standard office software.

6 Miscellaneous

CERTIFICATE

A **certificate of attendance** is given to registered participants on request. Please make your request when you register. The certificate is signed by the General Chair and is available from the information desk on Wednesday, October 17, 2012.

COFFEE AND LUNCH BREAKS

Sunday, October 14 15:45 h – 16:15 h coffee break

Monday, October 15

10:15 h – 11:00 h coffee break 12:45 h – 14:00 h lunch break 15:45 h – 16:15 h coffee break

Tuesday, October 16

10:15 h - 11:00 h coffee break 12:45 h - 14:00 h lunch break 15:45 h - 16:15 h coffee break

Wednesday, October 17

10:15 h – 11:00 h coffee break 12:45 h – 14:00 h lunch break 15:30 h – 16:00 h coffee break

EMERGENCY	Police 110
NUMBERS	Fire Department and Eme

 NUMBERS
 Fire Department and Emergency Medical Services 112

 LANGUAGE
 The conference language is English.

 LOST PROPERTY
 Please hand over any lost property items to the information desk staff where they will be stored. After the conference, they will be handed over to lost and found at TU Berlin.

NAME BADGE Please always wear your **name badge** throughout the conference. This also includes the evening events. If the name badge is lost, please obtain a new one at the registration desk.

ATRIUM AT TU BERLIN

6 Miscellaneous (continued)

INFORMATION AND	
REGISTRATION HOURS	

The **information and registration desk** is staffed during the following hours.

Sunday, October 14	13:00 h – 18:00 h
Monday, October 15	08:00 h – 18:00 h
Tuesday, October 16	08:00 h – 18:00 h
Wednesday, October 17	08:00 h – 18:00 h

On Wednesday, new on-site registrations may only be made during the following hours:

Wednesday, October 17 08:00 h - 11:00 h

- REGIONAL AREA There are a number of websites that provide helpful information INFORMATION on the Berlin Area. The official website of the city of Berlin is available under www.berlin.de. Berlin public transport is found at www.bvg.de. The airport information website is www.berlinairport.de.
 - SMOKING **Smoking** within the TU Berlin buildings is prohibited. There are designated smoking areas outside the building.
 - WLAN **WLAN** is provided within the conference venue. The log-in data is offered with the name badge. A user guide is provided with the conference bag.

Disclaimer

The Local Organizing Committee (LOC) and TU Berlin accept no liability for injuries / losses of whatever nature incurred by participants and / or accompanying persons, nor loss of, or damage to, their luggage and / or personal belongs.

Program



Informal Reception



This reception is supported by the Student and GOLD (Graduates of the Last Decade) Programs and will take place in the atrium of the main building of TU Berlin. It is an ideal place to meet and network while enjoying light complementary food and non-alcoholic beverages. Students not already having presentations scheduled in other sessions may display posters. Professor Henry Louie will give a presentation on the GOLD Program at 18:30 h. More on the supporting programs and events is described in section Conference Program Elements.

Network Integration of Electric Vehicles

14:00 - 18:00

@ H 1058

TUTORIAL



João A. Peças Lopes, INESC Porto, Portugal

João A. Peças Lopes is Full Professor at the Faculty of Engineering of University of Porto (FEUP). He is presently Director of INESC Porto and also the Director of the Sustainable Energy Systems PhD program at FEUP. He was Scientific / Technical Coordinator of the European Union FP7 research project MERGE – Mobile Energy Resources for Grids of Electricity. Prof. Lopes is the convener of the CIGRE WG C6.20 on integration of electric vehicles in electric power systems. His main domains of research are presently related with large scale integration of renewable power sources, power system dynamics, microgeneration and microgrids, smart metering and electric vehicle grid integration.

He was the responsible for several consulting projects related with the electrical grid impact. He supervised the impact analysis of the connection of wind parks in the electrical grids of Madeira, Azores, Sal, S. Vicente and S. Tiago, in the Republic of Cabo Verde.



Nikos Hatziargyriou, National Technical University of Athens, Greece

Nikos D. Hatziargyriou is Professor at the Power Division of the Electrical and Computer Engineering Department of NTUA. From February 2007 to August 2012, he was Deputy CEO of the Public Power Corporation (PPC) of Greece, responsible for Transmission and Distribution Networks, island DNO and the Center of Testing, Research and Prototyping.

Dr. Hatziargyriou is Fellow Member of IEEE, past Chair of the Power System Dynamic Performance Committee and Chair of CIGRE SCC6. He was member of the EU Advisory Council of the Technology Platform on Smart Grids. He has participated in more than 60 R&D Projects, and was coordinator of the EU funded "Care", "More Care", "Rise", "Microgrids", "More Microgrids" and "Merge". He is author of more than 250 scientific publications. His research interests include Smartgrids, Microgrids, Distributed and Renewable Energy Sources and Power System Security.

Abstract

This tutorial addresses several issues related with electrical vehicles grid integration. like: (1) Evaluation of the impacts of Electric Vehicles (EV) charging on the daily load profile and on the grid operation. (2) Description of new business models, management architectures and new simulation tools for assessing EV grid integration, regarding steady state operation and system dynamic behaviour. Results from the analysis of several study cases will be presented using the simulations tools described. (3) The role of e-mobility in smart grid development and its impacts on the integration of renewables at the distribution and transmission levels. Results from several study cases in Europe will be presented. (4) Evaluation of the Economic Value of Grid Services provided by EV users. Advanced methods to estimate the economic value of these grid services will be presented. Results of a case study at the German regulation power market will be presented to show the economic value of the EV over its lifetime.

Methods and Controls for Network Integration of Electric Vehicles João A. Peças Lopes, INESC Porto, Portugal

Impact of Electric Vehicles Connected to the Grid

Nikos Hatziargyriou, National Technical University of Athens, Greece

Economic Value Estimation for Electric Vehicle Users Stefan Mischinger, TU Berlin, Germany Ō

Gas-insulated Lines (GIL)

14:00 - 18:00

@ H 0110

TUTORIAL



Hermann Koch, Siemens, Germany

Dr.-Ing. Hermann Koch is Director of Standards and Regulations of the High Voltage Technology at Siemens. He graduated in Industrial Control Engineering at the Fachhochschule Rüsselsheim and in Electrical Engineering at the TU Darmstadt in 1979 and 1986, respectively. In 1990 he received his Dr.-Ing. degree from the TU Darmstadt.

Hermann Koch is Chairman of the IEEE PES Substations Committee. In IEC he is Secretary of SC 17C High Voltage Switchgear Assemblies, and in CIGRE member of the Strategic Advisory Group of SC B3 Substations. He is engaged in studies, innovations, and R&D activities for high voltage gas insulated power transmission systems.

Abstract

With the increase of wind and solar energy generation, the need of strong transmission lines for power exchange between regions will increase. New transmission routes are required and existing will need up-grading. The gas insulated line can offer solutions when underground transmission is needed. This tutorial gives basic theoretical information on the gas insulated technology for the design and physical layout. The historical development of GIL product design, insulating gases, laying options, testing, system and network requirements, environmental impact, economical aspects and examples of practical applications are content of the tutorial. Mile stones of applications like the first 400 kV GIL in Schluchsee, Germany from 1975, the first gas mixture GIL at Palexpo, Geneva, Swiss in 2001 and the first gas mixture insulated and directly buried 400 kV GIL at Kelsterbach, Germany in 2010 are explained in detail.

innovative ideas innovative technologies innovative products

The TSB Technologiestiftung Berlin stands for innovation and technology development in Germany's capital region. It promotes science and supports regional industry. The TSB Foundation focuses on strategy development, education, and science communication. The TSB Innovation Agency's main services are cluster management, network initiation and management as well as tech transfer in the fields life science & healthcare, transport & mobility, energy technology, optics & microsystems technology, ICT as well as further technology oriented industries.

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be Berlin





Some projects of the TSB Technologiestiftung Berlin are funded by the federal state of Berlin and the Investitionsbank Berlin, cofunded by the European Union – European Regional Development Fund. Investing in your Future

	Main Theater	H1058	H0107	H0110	H0111	H0112
8:45	PLENARY					
	8:45, p. 24					
	Chair: Kai Strunz					
	Conference Opening					
	_					
10:15						
		10:15 – 11:00 COFFEE BREAK				
11:00	PLENARY					
	11:30, p. 28					
	Chair: Kai Strunz					
	Smart Grid					
	Perspectives					
	and Solutions					
40:45						
12:45						
		12:45 – 14:00 LUNCH BREAK				
14:00	PANEL	PAPER PRESENTATION	PAPER PRESENTATION	TUTORIAL	PAPER PRESENTATION	PAPER PRESENTATION
	14:00, p. 32	14:00, p. 34	14:00, p. 35	14:30, p. 36	14:00, p. 38	14:00, p. 39
	Chair: Chen-Ching Liu	Chair: Adam Wolisz	Chair: Madeleine Gibescu	Chair: István Erlich	Chair: Henry Louie	Chair: Mario Paolone
	Cyber Security of Smart	Control in Smart Homes	Smart Grid Modeling	Utilization of Wind	Multi-objective	Protection and Fault
	Grids		Techniques	Energy in Germany:	Operation of Smart Grid	Analysis
				Integration Experience		
15:30						
	_	15:30 - 16:15 COFFEE BREAK				
16:15	PANEL	PANEL	PAPER PRESENTATION	TUTORIAL	PAPER PRESENTATION	PAPER PRESENTATION
	16:15, p. 40	16:15, p. 42	16:15, p. 44	16:15, p. 36	16:15, p. 45	16:15, p. 46
	Chair: João A. Peças Lopes	Chair: Peter W. Sauer	Chair: Victoria Neimane	Chair: István Erlich	Chair: Hendrik Neumann	Chair: Anke Weidlich
	Integration of Electric	Smart Transmission	Design and Operation	Utilization of Wind	Data and Fault Analysis	Solutions to Uncertainty
	Vehicles: International	Technologies	of Virtual Power Plants	Energy in Germany:	With PMU	of Renewable Power
	Experience			(continued)		Generation
				(continueu)		

1800

Conference Opening

08:45 - 10:15

@ MAIN THEATER

PLENARY



Opening Notes Chair: Kai Strunz, TU Berlin, Germany

Kai Strunz has been Professor and Chair of Sustainable Electric Networks and Sources of Energy (SENSE) at TU Berlin since 2007. He obtained the Dr.-Ing. degree with summa cum laude from Saarland University in 2001. From 1995 to 2007, he was research assistant at Brunel University in London, research engineer at Electricité de France (EDF) and Assistant Professor at the University of Washington in Seattle. Dr. Strunz received the National Science Foundation (NSF) CAREER award in 2003.

Dr. Strunz is Chair of IEEE PES Subcommittee on Distributed Generation & Energy Storage and Vice Chair of IEEE PES Subcommittee on Research in Power & Energy Education. He is Affiliate Associate Professor at the University of Washington, Seattle. Dr. Strunz has been active on editorial boards and co-manages the operation of the Power Globe email forum. He was Review Editor for the IPCC (Intergovernmental Panel on Climate Change) from 2009 to 2011.



Welcome From the Host

Jörg Steinbach, President of TU Berlin, Germany

Jörg Steinbach is President of TU Berlin and holds the Chair of Plant Safety of Industrial Systems and Chemical Process Safety. He received his Dr.-Ing. degree in chemical engineering from TU Berlin. While being responsible for the area of plant safety at Schering AG, Berlin, he habilitated in chemical engineering in 1994.

Prof. Steinbach is deputy chairman of the executive board of the Accreditation Agency for Degree Programs in Engineering, Informatics/Computer Science, the Natural Sciences and Mathematics

(ASIIN). He is a member of the Technical Committee on Plant Safety at Federal Environmental Ministry (BMU). Furthermore , Prof. Steinbach is a member of the American Institute of Chemical Engineers, member of the New York Academy of Science, and a member of "European Society for Engineering Education" (SEFI – Société Européenne pour la Formation des Ingénieurs), from 2007 – 2009 as its president.



Hans-Joachim Otto, Parliamentary State Secretary in the Federal Ministry of Economics and Technology, Germany

Hans-Joachim Otto is Parliamentary State Secretary at the Federal Ministry of Economics and Technology (BMWi) and Federal Government Coordinator for the maritime industry. The BMWi is one of the major funding agencies of the technical and economic research in Germany and an important supporter of the conference.

The remit of Mr. Otto includes the coordination and pooling of federal measures to strengthen the international competitiveness of Germany in the fields of shipbuilding, shipping, ports, and marine technology. Other focal points of his work are modern information and communication technologies, and the cultural and creative economy initiative of the Federal Government.



Welcome From the Supporters

Li Xiaolin, China Power International New Energy, China

Ms. Li Xiaolin is the Chairwoman of both China Power International Holding Ltd. and China Power International Development Ltd. She is Chairwoman of directors of China Power New Energy Development Ltd., a board director of Companhia de Electricidade de Macau, and an executive director of the Hong Kong Chinese Enterprises Association. Ms. Li graduated from Tsinghua University, majoring in electric power system and automation, and got a master's degree in engineering. She was a visiting scholar to Sloan Management School of Massachusetts Institute of Technology in the United States.

Conference Opening (continued)

08:30 - 10:15

@ MAIN THEATER

PLENARY

Ms. Li is one of the most important leaders of the People's Republic of China in the sector of modern and green energy. She represents China as a council member of Copenhagen Climate Council. Ms. Li is a member of the 11th Chinese People's Political Consultative Conference, and an executive member of All-China Women's Federation. In 2010, she was elected one of "Top 50 Global Business Women" by Fortune magazine for the second time, and awarded "Top 10 Women of Chinese Brand", "Excellent Entrepreneurs with Integrity in China", and ranked the first of "2010 Top 10 Women in Economy". In 2011, she was selected as one of "Energy Figures in 2010-2011", one of "Top 10 Models in 30 Years' Enterprise Culture Practice", and one of "2011 CCTV China Economic Annual Figures".



IEEE PES – Smart Networking for the Smart Grid Noel Schulz, IEEE PES President and Kansas State University, USA

Noel Schulz is IEEE PES President (2012-2013), Associate Dean for Research & Graduate Programs and Paslay Professor at Kansas State University, USA. She received her B.S.E.E. and M.S.E.E. degrees from Virginia Tech in 1988 and 1990, respectively. She received her Ph.D. in EE from the University of Minnesota in Minneapolis in 1995. Dr. Schulz spent eight years at Mississippi State University (MSU) and has of over 19 years of teaching experience including other schools such as Michigan Technological University, University of North Dakota and Virginia Tech. She received the U.S. National Science Foundation CAREER award.

Dr. Schulz is a member of Eta Kappa Nu (Electrical Engineering Honorary Society), Tau Beta Pi (Engineering Honor Society), the American Society for Engineering Education (ASEE), the Society of Women Engineers, and the National Society of Black Engineers. She served on the Board of Directors for ASEE from 2008-2010.

"The 'Energiewende' in Berlin needs innovation, a security of supply – and me."

Employees of Vattenfall, the operator of the Berlin grid, are working on the "Energiewende". Our promise is to connect new renewable energy systems within one week. www.vattenfall.de/kundenversprechen



VATTENFALL 😂

Smart Grid Perspectives and Solutions

11:00 - 12:45

@ MAIN THEATER

PLENARY



Chair: Kai Strunz, TU Berlin, Germany

Kai Strunz has been Professor and Chair of Sustainable Electric Networks and Sources of Energy (SENSE) at TU Berlin since 2007. He obtained the Dr.-Ing. degree with summa cum laude from Saarland University in 2001. From 1995 to 2007, he was research assistant at Brunel University in London, research engineer at Electricité de France (EDF) and Assistant Professor at the University of Washington in Seattle. Dr. Strunz received the National Science Foundation (NSF) CAREER award in 2003.

Dr. Strunz is Chair of IEEE PES Subcommittee on Distributed Generation & Energy Storage and Vice Chair of IEEE PES Subcommittee on Research in Power & Energy Education. He is Affiliate Associate Professor at the University of Washington, Seattle. Dr. Strunz has been active on editorial boards and co-manages the operation of the Power Globe email forum. He was Review Editor for the IPCC (Intergovernmental Panel on Climate Change) from 2009 to 2011.



Co-Chair: Nikos Hatziargyriou, National Technical University of Athens, Greece

Nikos D. Hatziargyriou is Professor at the Power Division of the Electrical and Computer Engineering Department of NTUA. From February 2007 to August 2012, he was Deputy CEO of the Public Power Corporation (PPC) of Greece, responsible for Transmission and Distribution Networks, island DNO and the Center of Testing, Research and Prototyping. Dr. Hatziargyriou is Fellow Member of IEEE, past Chair of the Power System Dynamic Performance Committee and Chair of CIGRE SCC6. He was member of the EU Advisory Council of the Technology Platform on Smart Grids. He has participated in more than 60 R&DD Projects, and was coordinator of the EU funded "Care", "More Care", "Rise", "Microgrids", "More Microgrids" and "Merge". He is author of more than 250 scientific publications. His research interests include Smartgrids, Microgrids, Distributed and Renewable Energy Sources and Power System Security.



Building Next Generation Smart Grid Architectures Laurent Schmitt, Alstom, France

Laurent Schmitt is Vice President for Smart Grid Solutions at ALSTOM. He graduated in September 1998 from Supelec in Paris with a degree in Power System Engineering. He has been Sales and Product Marketing Director for South-East Asia at ALS-TOM, Director for Strategy at the Areva T&D Bussiness Unit, and Vice-President for Strategy & Innovation for ALSTOM's Energy Management Business.

Laurent Schmitt is member of several strategic industry committees working on Smart Grids such as CIGRE, IEC, EPRI and ENTSOe and contributes to several expert advisory taskforces to the European Commission, the International Energy Agency (IEA), and several university consortia including the University College Dublin, in the areas of generation, Smart Grid and storage applications. He recently co-authored a white paper on Smart Grids standards convergence published through the CIMUsergroup as well as on Smart Cities for the World Energy Conference.

Smart Grid Perspectives and Solutions

(continued)

11:00 - 12:45

@ MAIN THEATER

PLENARY



Smart Grids – A Global Evolution of Power Systems Jochen Kreusel, ABB, Germany

Jochen Kreusel is head of the Smart Grids program of the ABB group, Zurich. He graduated with the Dipl.-Ing. and Dr.-Ing. degrees from RWTH Aachen University. In 1994, he joined ABB where he held managing positions in marketing and technology of high and medium voltage switchgear until 1998. From 1999 to 2001, he set up a new ABB subsidiary dealing with software solutions for utilities in liberalized energy markets. From 2001 to 2002, he was in charge for identifying and financing new business ideas for ABB. From 2002 to 2010, he was member of the management board of marketing and sales for the power technologies divisions.

Jochen Kreusel is honorary professor at RWTH Aachen University. Since January 1, 2008 Jochen Kreusel has been chairman of the Power Engineering Society (ETG) within the German Association for Electrical, Electronic & Information Technologies (VDE).



The New Energy Landscape – Berlin at the Heart of the Energy Change

Helmar Rendez, Vattenfall, Germany

Helmar Rendez is Head of the Business Unit "Distribution" of the Vattenfall Group and responsible for all network activities within the Vattenfall Group. Dr. Rendez is also the chairman of the Managing Board of Vattenfall Europe Distribution Berlin/Hamburg GmbH Since 1998 he has held various executive positions within the energy business: Member of the Executive Group Management of Vattenfall AB (2007-2010), Member of the Management Board of WEMAG AG (2004-2007), Head of Integration Management Office/Head of Corporate Development of Vattenfall Europe AG (2001-2004), and Head of Corporate Development of VEAG Vereinigte Energiewerke AG (1998-2001).

From 1993-1998, Dr. Rendez was appointed as Head of Service Management and Head of the Berlin branch of management consultants Kienbaum Unternehmensberatung GmbH. He started his career in 1988 at Zentrum für Logistik und Unternehmensplanung GmbH after his studies of economic engineering at the TU Berlin.



Smart Grids in the European Framework Ronnie Belmans, KU Leuven, Belgium

Ronnie Belmans is Full Professor with the K.U. Leuven, teaching electric power and energy systems. He received the M.S. degree in electrical engineering in 1979 and the Ph.D. degree in 1984, both from the K.U. Leuven, Belgium, the Special Doctorate in 1989 and the Habilitierung in 1993, both from the RWTH Aachen University, Germany. His research interests include techno-economic aspects of power systems, power quality and distributed generation.

Dr. Belmans is a guest professor at Imperial College of Science, Medicine and Technology, London. He was chairman of the board of directors of ELIA, the Belgian transmission grid operator from June 2002 to May 2010. Since June 2010, he has been honorary Chairman of the board of directors of ELIA. He is co-founder of the K.U. Leuven Energy Institute and the European Energy Institute, and co-founder and CEO of Energyville as well.

Cyber Security of Smart Grids

14:00 - 15:45

@ MAIN THEATER

PANEL



Chair: Chen-Ching Liu, Washington State University, USA and UCD, Ireland

Chen-Ching Liu is Boeing Distinguished Professor and Director of Energy Systems Innovation (ESI) Center at Washington State University, Pullman, USA, and Professor at University College Dublin, Ireland. He received his Bachelor and Master degrees from National Taiwan University and obtained the Ph.D. degree from the University of California, Berkeley. He held faculty positions at Iowa State University and the University of Washington, where he served as associate dean of engineering from 2000 to 2005 and was on the board of the Washington Technology Center.

Professor Liu received an IEEE Third Millennium Medal in 2000 and the Power and Energy Society Outstanding Power Engineering Educator Award in 2004. He chaired the IEEE Power and Energy Society Fellow Committee, Technical Committee on Power System Analysis, Computing and Economics, and Outstanding Power Engineering Educator Award Committee. Dr. Liu served as President of the International Council on Intelligent System Applications to Power Systems (ISAP). Professor Liu is a Fellow of the IEEE.

Abstract

Can hackers attack a smart grid? How secure and risky is the smart grid? This panel will address critical issues concerning cyber security of a smart grid. International distinguished panelists from industry and research institutions will discuss the next generation smart grid integrated security architectures, the value of risk, cyber security intrusion monitoring and detection, cyber security of SCADA systems, and modeling and assessment of SCADA system architectures. Cyber-Security of SCADA Systems Göran Andersson, ETH Zurich, Switzerland

Next-generation Smart Grid Integrated Security Architectures Laurent Schmit, Alstom, France

Cyber-physical Systems and Intrusion Detection Chen-Ching Liu, Washington State University, USA and UCD, Ireland

Smart Grid Cyber Security: The Value of Risk Giovanna Dondossola, RSE, Italy

Cyber Security Modeling and Assessment of SCADA System Architectures Mathias Ekstedt, KTH Stockholm, Sweden

Control in Smart Homes

14:00 - 15:45

@ H 1058

PAPER PRESENTATION

Chair: Adam Wolisz, TU Berlin, Germany

2012ISGTEU-205

Predictive Control of a Domestic Freezer for Real-time Demand Response Applications

Nadina Baghină (Eindhoven University of Technology, Netherlands), Ioannis Lampropoulos (Eindhoven University of Technology, Netherlands), Ballard Asare-Bediako (Eindhoven University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands), Paulo F. Ribeiro (Eindhoven University of Technology, Netherlands)

2012ISGTEU-014

Model Predictive Controller for Active Demand Side Management With PV Self-consumption in an Intelligent Building

Yi Zong (Technical University of Denmark, Denmark), Lucian Mihet-Popa (Technical University of Denmark, Denmark), Daniel Kullmann (Technical University of Denmark, Denmark), Anders Thavlov (Technical University of Denmark, Denmark), Oliver Gehrke (Technical University of Denmark, Denmark), Henrik W. Bindner (Technical University of Denmark, Denmark)

2012ISGTEU-292 Residential Energy Management Using a Moving Window Algorithm

Marc Beaudin (University of Calgary, Canada), Hamidreza Zareipour (University of Calgary, Canada), Antony Schellenberg (University of Calgary, Canada)

2012ISGTEU-225

Consumer Operational Comfort Level Based Power Demand Management in the Smart Grid

Yan Chen (Huazhong University of Science and Technology, China), Ren Ping Liu (CSIRO, Australia), Chen Wang (CSIRO, Australia), Martin de Groot (CSIRO, Australia), Zhiyuan Zeng (Huazhong University of Science and Technology, China)

2012ISGTEU-022

Evaluation of Management Strategies for Thermostatic Loads in Smart Grid Mustafa Alparslan Zehir (Istanbul Technical University, Turkey), Mustafa Bagriyanik (Istanbul Technical University, Turkey)

2012ISGTEU-274

Fuzzy and Parametric Method for Selfconfiguration of Home Energy Manager System Sylvain Guillemin (CEA, France), D. Long Ha (CEA, France)

Smart Grid Modeling Techniques

14:00 - 15:45

@ H 0107

PAPER PRESENTATION

Chair: Madeleine Gibescu, Delft University of Technology, Netherlands

2012ISGTEU-126 ICT Modeling for Integrated Simulation of Cyber-physical Power Systems Alexandru Stefanov (UCD, Ireland),

Chen-Ching Liu (Washington State University, USA, and UCD, Ireland)

2012ISGTEU-035

Synthetic Medium Voltage Grids for the Assessment of Smart Grid Techniques Han Rui (TU Kaiserslautem, Germany), Maximilian Arnold (TU Kaiserslautem, Germany), Wolfram H. Wellssow (TU Kaiserslautem, Germany)

2012ISGTEU-268 Complex Normalization to Perform Power Flow Analysis in Emerging

Distribution Systems

Carolina C. Durce (Federal University of Paraná, Brazil), Odilon L. Tortelli (Federal University of Paraná, Brazil), Elizete M. Lourenço (Federal University of Paraná, Brazil), Tarcisio Loddi (COPEL, Brazil)

2012ISGTEU-250

Parallelization of Radial Three-Phase Distribution Power Flow Using GPU Dino Ablakovic (Siemens, Germany), Izudin Džafić (Siemens, Germany), Serdar Kecici (evoline TR, Turkey)

2012ISGTEU-070

Multi-scale Modeling and Simulation of Synchronous Machine in Phase-domain Hua Ye (TU Berlin, Germany), Feng Gao (IBM, China), Kai Strunz (TU Berlin, Germany), Yue Xia (TU Berlin, Germany)

2012ISGTEU-243

A New Transmission Cost Allocation Method Considering Power Flow Duration Time in Smart Grid

Xi Jia (Tsinghua University, China), Qing Xia (Tsinghua University, China), Qixin Chen (Tsinghua University, China)

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Utilization of Wind Energy in Germany: Technology and Grid Integration Experience

14:30 - 17:30

@ H 0110

TUTORIAL



István Erlich, University of Duisburg-Essen, Germany

István Erlich has been Professor and Head of the Institute of Electrical Power Systems of the University of Duisburg-Essen in Germany since 1988. He received his Dipl.-Ing. degree in electrical engineering from the University of Dresden in Germany in 1976 and his Ph.D. in 1983 from the same university. After his studies, he worked in Hungary, Berlin and Dresden in different fields of power engineering.

His major scientific interest is focused on power system stability and control, modeling and simulation of power system dynamics including intelligent system applications, smart grids and renewable energy sources. He is a member of VDE and senior member of IEEE. He is also chairing the IFAC Technical Committee 6.3 on Power and Energy Systems.

Abstract

By the end of 2011 the installed wind power capacity in Germany has reached 30 GW. Considering the German peak load which is about 80 GW, it is easy to see why the integration of wind power has become a challenge. On the one hand the wind turbine technology and control have to be adapted to meet grid requirements, and on the other hand the grid itself must be redesigned to be able to transmit the power from the wind to the load centers. Of particular importance in the overall consideration are grid codes. The tutorial provides an overview about the current situation and experiences in Germany. In particular the following topics are discussed:

wind turbine technologies, German grid code, wind turbine modeling and control, fault ride-through, reactive power and voltage control by wind turbines, contribution to active power control, aspects of wind farm design.

The attendees get the opportunity to understand the basic principles of wind turbine operation and control as well as their characteristic behaviors in steady state and following grid disturbances. The requirements for grid integration according to the German grid code and how those requirements can be met by modern wind turbines are explained.

Multi-objective Operation of Smart Grid

14:00 - 15:45

@ H 0111

PAPER PRESENTATION

Chair: Henry Louie, Seattle University, USA

2012ISGTEU-208

Coordinated Optimal Dispatch of Distributed Energy Resources Within a Smart Energy Community Cell

Amir Fazeli (University of Nottingham, UK), Mark Sumner (University of Nottingham, UK), C. Mark Johnson (University of Nottingham, UK), Edward Christopher (University of Nottingham, UK)

2012ISGTEU-033

Distributed Control Strategy for a Grid-Connected Hybrid System With Batteries and Renewable Sources Oana L. Onet (Technical University of Cluj-Napoca, Romania), Damien Paire (UTBM, France), Arnaud Gaillard (UTBM, France), Benjamin Blunier (UTBM, France), Radu Tirnovan (Technical University of

Cluj-Napoca, Romania) 2012ISGTEU-046

Utilization of Battery Energy Storage System for Load Frequency Control Toward Large-Scale Renewable Energy Penetration

Hiroyuki Amano (Central Research Institute of Electric Power Industry, Japan), Yuji Ohshiro (Central Research Institute of Electric Power Industry, Japan), Tomonori Kawakami (Central Research Institute of Electric Power Industry, Japan), Toshio Inoue (Central Research Institute of Electric Power Industry, Japan)

2012ISGTEU-289

Load Frequency Control by Aggregations of Thermally Stratified Electric Water Heaters Evangelos Vrettos (ETH Zurich, Switzerland), Stephan Koch (ETH Zurich, Switzerland), Göran Andersson (ETH Zurich, Switzerland)

2012ISGTEU-074 Capacity Management Within a Multi-agent Market-based Active Distribution Network

Joost A. W. Greunsven (Eindhoven University of Technology, Netherlands), Else Veldman (Eindhoven University of Technology, Netherlands), Phuong H. Nguyen (Eindhoven University of Technology, Netherlands), Han G. Slootweg (Eindhoven University of Technology, Netherlands), René Kamphuis (Eindhoven University of Technology, Netherlands)

Protection and Fault Analysis

14:00 - 15:45

@ H 0112

PAPER PRESENTATION

Chair: Mario Paolone, EPFL, Switzerland

2012ISGTEU-180

A Neodymium Permanent Magnet Fault Current Limiter for Use in the FREEDM Project

George G. Karady (Arizona State University, USA), Jay R. Prigmore (Arizona State University, USA), Jorge A. Mendoza (Arizona State University, USA)

2012ISGTEU-119

Contribution of Negative-sequence Controlled Distributed Generation to Power System Stability Under Unbalanced Faults: A Discussion Paper Jens C. Boemer (Delft University of Technology, Netherlands), Barry G. Rawn (Delft University of Technology, Netherlands), Madeleine Gibescu (Delft University of Technology, Netherlands), Edward Coster (Eindhoven University of Technology, Netherlands), Mart A.M.M. van der Meijden (Delft University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands)

2012ISGTEU-071

Settings-free Method to Account for Shunt Admittance in Fault Location

Shantanu Padmanabhan (University of Manchester, UK), Vladimir Terzija (University of Manchester, UK)

2012ISGTEU-116

Assessing the Risk Associated With a High Penetration of System Integrity Protection Schemes

Mathaios Panteli (University of Manchester, UK), Peter A. Crossley (University of Manchester, UK)

2012ISGTEU-123

Multiple Measurements to Locate Single Phase Earth Fault in Compensated Network

Matthieu Loos (Université Libre de Bruxelles, Belgium), Stefan Werben (Siemens, Germany), Jean-Claude Maun (Université Libre de Bruxelles, Belgium)

2012ISGTEU-139

External Grid Representation for Assessing Fault Ride Through Capabilities of Distributed Generation Units

Traian N. Preda (Norwegian University of Science and Technology, Norway), Kjetil Uhlen (Norwegian University of Science and Technology, Norway), Dag E. Nordgård (SINTEF Energy Research, Norway), Trond Toftevaag (SINTEF Energy Research, Norway)

Integration of Electric Vehicles: International Experience

16:15 - 18:00

@ MAIN THEATER

PANEL



Chair: João A. Peças Lopes, INESC Porto, Portugal

João A. Peças Lopes is Full Professor at the Faculty of Engineering of University of Porto (FEUP). He is Director of INESC Porto and Director of the Sustainable Energy Systems PhD program at FEUP. He was Scientific / Technical Coordinator of the European Union FP7 research project MERGE – Mobile Energy Resources for Grids of Electricity. Prof. Lopes is the convener of the CIGRE WG C6.20 on integration of electric vehicles in electric power systems.

He was the responsible for several consulting projects related with the electrical grid impact. He supervised the impact analysis of the connection of wind parks in the electrical grids of Madeira, Azores, Sal, S. Vicente and S. Tiago, in the Republic of Cabo Verde.

Abstract

The need to largely reduce the amount of Carbon Dioxide emissions in the coming years requires a large effort. Electric vehicles can be part of the solution for the transportation sector. The expected growing demand for electricity resulting from the introduction of electrically powered cars calls for the development of innovative concepts under the smart grid paradigm in order to exploit the availability of renewable generation. This panel introduces international experience in integrating electric vehicles into the smart grid from Germany, Italy, Ireland, Greece, and Saudi Arabia. Advanced Control and Management Solution to Allow Large-scale Integration of EVs Nikos Hatziargyriou, National Technical University of Athens, Greece

Integrating Electric Vehicles and Renewables in the Grid – The Need for Managed Charging Franziska Schuth, Vattenfall, Germany

Integrating a National Electric Vehicle Charging Infrastructure Into Irish Electricity System Senan McGrath, ESB ecars, Ireland

Electric Vehicles Are Underway – Saudi Arabia and Around Ali T. Al-Awami, King Fahd University of Petroleum & Minerals, Saudi

Arabia

Framework for Electromobility in the European Green eMotion Project Thomas Gereke, Siemens, Germany

E-Mobility Demonstration Projects in Italy for European Integration Iva Maria Gianinoni, RSE, Italy

Smart Transmission Technologies

16:15 - 18:00

@ H 1058

PANEL



Chair: Peter W. Sauer, University of Illinois, USA

Peter Sauer is Grainger Chair Professor at the University of Illinois at Urbana-Champaign. From 1969 to 1973, he was in the Air Force working on design and construction of airfield lighting and electrical distribution systems. He obtained the M.S. and Ph.D. degrees in Electrical Engineering from Purdue University in 1974 and 1977 respectively.

From 1991 to 1992 he served as the Program Director for Power Systems at the National Science Foundation. He is a cofounder of PowerWorld Corporation. He is a cofounder of the Power Systems Engineering Research Center (PSERC) and has served as the Illinois site director from 1996 to the present. He served in the Air Force Civil Engineering reserves at Chanute AFB, Illinois and Scott AFB, Illinois until his retirement as a Lt. Col. in 1998. He is currently the Grainger Chair Professor of Electrical Engineering at Illinois. He is a member of the U.S. National Academy of Engineering.

Abstract

The development of a future-ready grid faces new challenges and those require smart solutions. How to realize the connection of offshore wind parks? What is the potential of power-to-gas in a smart grid? How to monitor and control wide area power systems? What advantages arise with an integration of infrastructures? In this panel, experts from industry will discuss the usage of the gas system as flexibility provider for wind power production, large scale grid connection of offshore wind parks, integration of diverse infrastructures, and wide area power system monitoring and control. The Gas System as Flexibility Provider for Wind Power Production Anders Hansen, Energinet, Denmark

Feasibility Study for Large-scale Grid Connections of Remote Offshore Wind Energy Fred Wendt, ILF Consulting Engineers, Germany

Cross-cutting Integration of Infrastructures Maren Kuschke, TU Berlin, Germany Kai Strunz, TU Berlin, Germany Jutta Hanson, TU Darmstadt, Germany Dirk Westermann, TU Ilmenau, Germany Martin Pokojski, Vattenfall and VDE, Germany

Challenges for the Future Coordinated and Stable Operation of the Pan-European Power System and Innovative Tools to Overcome These Challenges Jean-Baptiste Heyberger, RTE, France

Wide Area Power System Monitoring and Control – International Case Studies Patrick NcNabb, Psymetrix, UK

Design and Operation of Virtual Power Plants

16:15 - 18:00

@ H 0107

PAPER PRESENTATION

Chair: Victoria Neimane, Vattenfall, Sweden

2012ISGTEU-131

Coordinating Independent Distributed Generators

José A. Barros (University of Porto, Portugal), Helder Leite (University of Porto, Portugal), Nick Jenkins (Cardiff University, UK)

2012ISGTEU-165

Coordination of Distributed Generators Through the Virtual Power Plant Concept

Lucian Toma (University "Politehnica" of Bucharest, Romania), Bogdan Otomega (University "Politehnica" of Bucharest, Romania), Constantin Bulac (University "Politehnica" of Bucharest, Romania), Ion Tristiu (University "Politehnica" of Bucharest, Romania)

2012ISGTEU-215

Virtual Integration Technology of **Distributed Energy Storages**

Hisato Sakuma (NEC, Japan), Yuma Iwasaki (NEC, Japan), Hitoshi Yano (NEC, Japan), Koji Kudo (NEC, Japan)

2012ISGTEU-152

Towards Frequency Control With Large Scale Virtual Power Plants

Sebastian Ruthe (TU Dortmund, Germany), Christian Rehtanz (TU Dortmund, Germany), Sebastian Lehnhoff (OFFIS, Germany)

2012ISGTEU-158 Intelligent Electric Vehicle Heuristic for Energy Resource Management Using Simulated Annealing

Tiago Sousa (Polytechnic of Porto, Portugal), Tiago Pinto (Polytechnic of Porto, Portugal). Hugo Morais (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic of Porto, Portugal)

2012ISGTEU-080

A Virtual Power Plant Management Model Based on Electric Vehicle **Charging Infrastructure Distribution** Maura Musio (Sardegna Ricerche, Italy), Alfonso Damiano (University of Cagliari, Italy)

2012ISGTEU-156

Energy and Reserve Provision Dispatch Considering Distributed Generation and Demand Response

Pedro Faria (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic of Porto, Portugal), Tiago Soares (Polytechnic of Porto, Portugal), Hugo Morais (Polytechnic of Porto, Portugal)

Data and Fault Analysis With PMU

16:15 - 18:00

@ H 0111

PAPER PRESENTATION

Chair: Hendrik Neumann, Amprion, Germany

2012ISGTEU-121 Short Circuit Current Estimation Using **PMU Measurements During Normal** Load Variation

Suresh C. Verma (Chubu Electric Power Company, Japan), Yoshiki Nakachi (Chubu Electric Power Company, Japan), Yoshihiko Wazawa (Chubu Electric Power Company, Japan), Yoko Kosaka (Toshiba, Japan), Takenori Kobayashi (Toshiba, Japan), Kazuya Omata (Toshiba, Japan), Yoshiki Takabayashi (Toshiba, Japan)

2012ISGTEU-108

Bad Data Detection in Two-stage State Estimation Using Phasor Measurements

Aditya Tarali (Northeastern University, USA), Ali Abur (Northeastern University, USA)

2012ISGTEU-239

Synchrophasor-based Data Mining for **Power System Fault Analysis**

Miftah Al Karim (KTH Stockholm, Sweden), Moustafa Chenine (KTH Stockholm, Sweden), Kun Zhu (KTH Stockholm, Sweden), Lars Nordström (KTH Stockholm, Sweden)

Algorithm for Screening PMU Data for Alicia J. Allen (University of Texas, USA), Sang-Wook Sohn (University of Texas, USA), Surva Santoso (University of Texas, USA), W. Mack Grady (University of Texas,

2012ISGTEU-204

USA)

2012ISGTEU-263

Power System Events

A Decision Tree-based Method for Power System Fault Diagnosis by Synchronized Phasor Measurements Pavam Zamani Dehkordi (Sharif

University of Technology, Iran), Ahmad Salehi Dobakhshari (Sharif University of Technology, Iran), Ali M. Ranjbar (Sharif University of Technology, Iran)

2012ISGTEU-015

Transmission Grid Fault Diagnosis by Wide Area Measurement System

A. Salehi Dobakhshari (Sharif University of Technology, Iran), Ali M. Ranjbar (Sharif University of Technology, Iran)

Solutions to Uncertainty of Renewable Power Generation

16:15 – 18:00

@ H 0112

PAPER PRESENTATION

Chair: Anke Weidlich, HS Offenburg University of Applied Sciences, Germany

2012ISGTEU-190

Method of Generating Sets of PV Plant Power Time Series for Grid Simulation Purposes

Michael Schmidt (GE Global Research, Germany), Ara Panosyan (GE Global Research, Germany), Eva-Maria Bärthlein (GE Global Research, Germany), Kathleen O'Brien (GE Global Research, USA), Oliver Mayer (GE Global Research, Germany)

2012ISGTEU-273

Application of Preconditioned Generalized Radial Basis Function Network to Prediction of Photovoltaic Power Generation

Hiroyuki Mori (Meiji University, Japan), Masato Takahashi (Meiji University, Japan)

2012ISGTEU-114

Hedging Strategies for Renewable Resource Integration and Uncertainty Management in the Smart Grid

Balakrishnan Narayanaswamy (IBM, India), T.S. Jayram (IBM, India), Voo Nyuk Yoong (Universiti Brunei Darussalam, Brunei Darussalam)

2012ISGTEU-220

A New Framework of Probabilistic Production Simulation of Power Systems With Wind Energy Resources Tianyu Ding (Xi'an Jiaotong University, China), Zhaohong Bie (Xi'an Jiaotong

University, China), Can Sun (Xi'an Jiaotong University, China), Can Sun (Xi'an Jiaotong University, China), Xiuli Wang (Xi'an Jiaotong University, China), Xifan Wang (Xi'an Jiaotong University, China)

2012ISGTEU-275

Wind Turbine Generator Modeling for Power Production Estimation and Reliability Analysis

Sara A. Mohamed (German University in Cairo, Egypt), Yasser G. Hegazy (German University in Cairo, Egypt

2012ISGTEU-107

Evaluating the Impact of Wind Turbine Shadows on an Integrated Wind and Solar Farm

Sahil Shanghavi (University of Texas at Austin, USA), W. Mack Grady (University of Texas at Austin, USA), Bradley Schwarz (E.ON, USA)

Welcome Reception

19:00 - 21:30

ORANGERY

EVENING PROGRAM

The Organization Team gratefully acknowledges the help offered by Gold Supporter Vattenfall for this Welcome Reception.

The Welcome Reception provides an opportunity to meet friends and colleagues and to get to know more members of the Smart Grid community from all over the world. Light complimentary food from the area and drinks will be served. The musical entertainment offered reminds of the important history and glory of the site.

The Orangery is connected to the west of Charlottenburg Palace and was built from 1709 to 1712 following the design of Eosander von Goethe. The Orangery was once house to a citrus tree collection. Thanks to its architectural beauty, it was then discovered as an ideal venue for splendid festivities.

More information is available at www.orangerie-charlottenburg.com .

Access to the Orangery is described in the section Conference Program Elements. The year 2012 marks the 300th birthday anniversary of King Frederick II of Prussia, who once lived in the connected Charlottenburg Palace.



	Main Theater	H1058	H0107	H0110	H0111	H0112
8:30	PANEL 8:30, p. 50 Chair: István Erlich Grid-friendly Design of Wind Parks	PANEL 8:30, p. 52 Chair: Martin Schipper Innovation Forum Smart Energy From the Berlin Brandenburg Area	PAPER PRESENTATION 8:30, p. 54 Chair: David Wallom Design of Information and Communication Tech- nology (ICT) Architectures for Smart Grids	PAPER PRESENTATION 8:30, p. 55 Chair: Florian Lennert International Visions for Smart Grid Realization by Country		PAPER PRESENTATION 8:30, p. 56 Chair: Yunhe Hou Computer Methods for Identifying and Mitigating Grid Stability
10:15						
		10:15 – 11:00 COFFEE BREAK				
11:00	PANEL 11:00, p. 58 Chair: Zbigniew A. Styczynski Smart Distribution Networks: International Experience	PAPER PRESENTATION 11:00, p. 60 Chair: Alan Rotz Smart Grid Experience From Field Trials	PAPER PRESENTATION 11:00, p. 61 Chair: Akihiko Yokoyama Optimal Charging of Electric Vehicles I	PAPER FORUM 11:00, p. 62 Chair: Thomas Luckenbach Information and Com- munication Technology (ICT) for Smart Grids	PAPER PRESENTATION 11:00, p. 64 Chair: Christian von Hirschhausen Demand Side Management of Distribution Networks	PAPER PRESENTATION 11:00, p. 65 Chair: George G. Karady Impact of Power Electronics Control
12:45						
	12:45 – 14:00 LUNO	CH BREAK / p. 66 Women in Engi	neering (WIE)			
14:00	PANEL 14:00, p. 68 Chair: Saifur Rahman Moving the Smart Grid forward: Perspectives for R&D	PAPER PRESENTATION 14:00, p. 70 Chair: Gert Schwarzbach HVDC and Offshore Wind Park Connection	PAPER PRESENTATION 14:00, p. 71 Chair: Antonio C. S. Lima Optimal Charging of Electric Vehicles II	PAPER FORUM 14:00, p. 72 Chair: Wil L. Kling Distribution System Modeling and Analysis	PAPER PRESENTATION 14:00, p. 74 Chair: Omer Usta Islanding Detection and Operation	PAPER PRESENTATION 14:00, p. 75 Chair: Martin Wolter Wide Area Transient Control and Stability Improvement With PMU
15:45						
		15:45 – 16:15 COFFEE BREAK				
16:15	PANEL 16:15, p. 76 Chair: Oliver Weinmann Economics of Smart Grids with Renewables	PANEL 16:15, p. 78 Chair: Nikos Hatziargyriou Microgrids: Building Blocks of the Smart Grid	PAPER PRESENTATION 16:15, p. 80 Chair: Hamid Zareipour Planning of Smart Grids	PAPER PRESENTATION 16:15, p. 81 Chair: Raphael Caire Methods for Integration of Wind Energy	PAPER PRESENTATION 16:15, p. 82 Chair: Saša Z. Djokić Advances to Real-time State Estimation	

18:00

Grid-friendly Design of Wind Parks

08:30 - 10:15

@ MAIN THEATER

PANEL



Chair: István Erlich, University of Duisburg-Essen, Germany

István Erlich has been Professor and Head of the Institute of Electrical Power Systems of the University of Duisburg-Essen in Germany since 1988. He received his Dipl.-Ing. degree in electrical engineering from the University of Dresden in Germany in 1976 and his Ph.D. in 1983 from the same university. After his studies, he worked in Hungary, Berlin and Dresden in different fields of power engineering.

His major scientific interest is focused on power system stability and control, modeling and simulation of power system dynamics including intelligent system applications, smart grids and renewable energy sources. He is a member of VDE and senior member of IEEE. He is also chairing the IFAC Technical Committee 6.3 on Power and Energy Systems.

Abstract

With the increasing share of wind turbines in power generation, grid-conform behavior of wind turbines becomes essential. Grid services such as voltage, reactive power or frequency control to be provided by renewable energy sources become increasingly indispensable. This imposes new challenges regarding design and control of wind parks. Therefore, this panel will address different issues of wind park control, design, and protection. The panel experts discuss challenges, experience, new trends, and approaches in this area.

Negative Sequence Requirements on Wind Turbines Holger Kühn, Tennet, Germany

The Impact of Wind Turbines on the Behavior of the Grid Protection – in Consideration of the Negative Sequence Interference Jörg Meyer, Jörg Dickert, Peter Schegner, TU Dresden, Germany

Voltage / Reactive Power Control by Wind Turbines Jens Fortmann, Repower, Germany

Power-electronic Asset Characteristic for Converter-dominated Offshore Grids

Carsten Heising, Avasition, Germany Daniel Meyer, Avasition, Germany Roman Bartelt, Avasition, Germany M. Koochack Zadeh, TenneT Offshore, Germany Thomas Jan Lebioda, TenneT Offshore, Germany Jochen Jung, TenneT Offshore, Germany

Propagation of Wind Turbine and PV Harmonics in Medium Voltage Grids

Rainer Zimmermann, Moeller Operating Engineering, Germany Jochen Möller, Moeller Operating Engineering, Germany

Smart Wind Farm Design With Grid Energy Storage System in Jeju island

Jeong-Min Lee, Hyosung Corporation, Korea Eel-Hwan Kim, Jeju National University, Korea Ho-Chan Kim, Jeju National University, Korea) Kwang Y. Lee, Baylor University, USA

Innovation Forum Smart Energy From the Berlin Brandenburg Area

08:30 - 10:15

@ H 1058

PANEL



Chair: Martin Schipper, TSB Technologiestiftung Berlin, Germany

Dipl.-Pol., M.Env.Sc. Martin Schipper has been head of department Energy Technology at the TSB Innovation Agency Berlin GmbH since 2011. Beyond energy, this also includes environmental topics such as water and waste as well as resource and material efficiency. Furthermore, Mr. Schipper is involved in the management team of the Cluster Energy Technology in Berlin-Brandenburg.

Mr. Schipper holds both a Master for Political Science and for Public and Private Environmental Management. Mr. Schipper was a project manager for international activities at TSB Innovation Agency Berlin GmbH from 2007 to 2011. He managed energy related European projects in the field of aerospace and railways. This includes ECORailS, Energy Efficiency and Environmental Criteria in the Awarding of Regional Rail Transport Vehicles and Services.

Abstract

The innovation forum offers attendees a look into activities in the Berlin Brandenburg area aimed at creating smart energy products and services. The presentations cover system solutions at the transmission, distribution, and home levels, as well as technologies such as electromagnetic filters. It is recognized that Berlin developments play an important role in the process of energy change mandated by the Federal Government. This panel is supported by Technologiestiftung Berlin (TSB). Optimization of Remedial Actions by Cooperation Between TSO and DSO Martin Wolter, 50Hertz

Grid Integration of Renewable Energy Sources and Hydrogen Storage Gerd Harms, Enertrag

Smart Grid Potential of Telecommunication Network Infrastructure Heiko Lehmann, Deutsche Telekom

Smart Professional Mobile Radio, the Wireless Platform for Smart Grid Rainer Frank, Mediabroadcast

Digital Substation Solutions, Supporting the Development of Smart Grids Enrique Isla, Alstom

EMC-filters in Electrical Systems – Passive and Active Suppression Volker Keddig, Fuss EMV

Energy-efficient EUREF Research Campus Development in Berlin-Schöneberg Reinhard Müller, EUREF

Innovative and Smart: Berlin Adlershof Beate Mekiffer, Wista Management

Merging e-Mobility and Smart Grids – New Concepts for Urban Areas Frank Christian Hinrichs, InnoZ

The Energy Pilot and Energy Management for Corporations Boris Heinz, Bondus energies

Key Performance Indicators as a Success Factor for Evaluating Demand Response Programs in Smart Grids Detlef Olschewski, Cleopa

Design of Information and Communication Technology (ICT) Architectures for Smart Grids

08:30 - 10:15

@ H 0107

PAPER PRESENTATION

Chair: David Wallom, University of Oxford, UK

2012ISGTEU-013

Requirements for Smart Grid ICT-Architectures

Sebastian Rohjans (OFFIS, Germany), Christian Dänekas (OFFIS, Germany), Mathias Uslar (OFFIS, Germany)

2012ISGTEU-134

Future Internet for Smart Distribution Systems

Yvonne-Anne Pignolet (ABB, Switzerland), Holger Elias (Nokia Siemens Networks, Germany), Timo Kyntäjä (VTT Technical Research Centre, Finland), Ignacio Martín Díaz de Cerio (Iberdrola, Spain), Jürgen Heiles (Siemens, Germany), Didier Boëda (INP Grenoble, France), Raphael Caire (INP Grenoble, France)

2012ISGTEU-093

Adaptive Architecture Development for Smart Grids Based on Integrated Building Blocks

Jörn Trefke (OFFIS, Germany), Christian Dänekas (OFFIS, Germany), Sebastian Rohjans (OFFIS, Germany), José Manuel González Vázquez (OFFIS, Germany)

2012ISGTEU-097

ICT Infrastructure Design Considering ICT Contingencies and Reserve Requirements on Transmission Level Erika Kämpf (Fraunhofer IWES, Germany), Michael Bauer (Fraunhofer IWES, Germany), Rainer Schwinn (Fraunhofer IWES, Germany), Martin Braun (Fraunhofer IWES, University of Stuttgart, Germany)

2012ISGTEU-258

Service Level Agreement: Coordination and Monitoring of Actors in Smart Grid Shahid Hussain (KTH Stockholm, Swe-

den), Rune Gustavsson (KTH Stockholm, Sweden), Arshad Saleem (KTH Stockholm, Sweden), Lars Nordström (KTH Stockholm, Sweden)

2012ISGTEU-049

Hybrid Grids: ICT-based Integration of Electric Power and Gas Grids – A Standards Perspective

Mathias Uslar (OFFIS, Germany), Filip Andrén (AIT, Austria), Wolfgang Mahnke (ABB, Germany), Sebastian Rohjans (OFFIS, Germany), Matthias Stifter (AIT, Austria), Thomas Strasser (AIT, Austria)

International Visions for Smart Grid Realization by Country

08:30 - 10:15

@ H 0110

PAPER PRESENTATION

Chair: Florian Lennert, InnoZ, Germany

2012ISGTEU-281

A National Project on Optimal Control and Demonstration of the Japanese Smart Grid for Massive Integration of Photovoltaic Systems

Akihiko Yokoyama (University of Tokyo, Japan), Hirofumi Akagi (Tokyo Institute of Technology, Japan), Yasuhiro Hayashi (Waseda University, Japan), Kazuhiko Ogimoto (University of Tokyo, Japan), Hideo Ishii (Tokyo Electric Power Company, Japan)

2012ISGTEU-222

Distributed Generation and Smart Power Grid UAE Vision for 2030

Abdul Hasib Siddique (The Petroleum Institute Abu Dhabi, United Arab Emirates), Heba K. Al Bloushi (ADCO, United Arab Emirates), Lisa Ann Lamont (The Petroleum Institute Abu Dhabi, United Arab Emirates)

2012ISGTEU-010

A Microgrid Concept for Isolated Territories of Russia

Konstantin V. Suslov (Irkutsk State Technical University, Russia)

2012ISGTEU-002

Investigation of the Power Scenario in India for the Implementation of Smart Grid

Parimal Acharjee (NIT Durgapur, India)

2012ISGTEU-285 Agent-based Integration of an Electric Car Sharing Fleet Into a Smart Distribution Feeder

Daniel Freund (TU Berlin, Germany), Andreas F. Raab (TU Berlin, Germany), Tobias Küster (TU Berlin, Germany), Sahin Albayrak (TU Berlin, Germany), Kai Strunz (TU Berlin, Germany)

2012ISGTEU-227

Effects of Large Scale EV and PV Integration on Power Supply Systems in the Context of Singapore

Matthias Huber (TUM CREATE, Singapore), Annette Trippe (TUM CREATE, Singapore), Philipp Kuhn (TU München, Germany), Thomas Hamacher (TU München, Germany)

Computer Methods for Identifying and Mitigating Grid Stability

08:30 - 10:15

@ H 0112

PAPER PRESENTATION

Chair: Yunhe Hou, University of Hong Kong

2012ISGTEU-061

Enhancement of Situation Awareness in Wide Area Transmission Systems for Electricity and Visualization of the Global System State

Christoph Schneiders (Amprion, Germany), Joachim Vanzetta (Amprion, Germany), Johannes F. Verstege (University of Wuppertal, Germany)

2012ISGTEU-186

Indicating and Mitigating Voltage Collapse Comparing Voltage Stability Indicators

Vegar Storvann (Norwegian University of Science and Technology, Norway), Emil Hillberg (Norwegian University of Science and Technology, Norway), Kjetil Uhlen (Norwegian University of Science and Technology, Norway)

2012ISGTEU-122

Impact of Synchrophasor Measurement Uncertainty on Detecting Voltage Stability Margin in Power Systems

Junjie Tang (RWTH Aachen, Germany), Junqi Liu (RWTH Aachen, Germany), Ferdinanda Ponci (RWTH Aachen, Germany), Antonello Monti (RWTH Aachen, Germany), Carlo Muscas (University of Cagliari, Italy), Sara Sulis (University of Cagliari, Italy)

2012ISGTEU-017

Novel Model of UPFC for Evaluating Transient Stability of a Multimachine System Including the Grid-connected Photovoltaic System Prechanon Kumkratug (Kasetsart University, Thailand)

2012ISGTEU-271 Controlling Transient Stability Through Line Switching

Sergio Bruno (Polytechnic School of Bari, Italy), Matteo D'Aloia (Polytechnic School of Bari, Italy), Giovanni De Carne (Polytechnic School of Bari, Italy), Massimo La Scala (Polytechnic School of Bari, Italy)

2012ISGTEU-069 Transient Stability Analysis by Reachable Set Computation

Matthias Althoff (TU Ilmenau, Germany), Milos Cvetkovic (Carnegie Mellon University, USA), Marija Ilic (Carnegie Mellon University, USA)



GRID

Power grids today face unprecedented challenges: improved efficiency to answer the growing energy demand, high reliability and stability under all conditions to prevent blackouts, and the integration of renewable energy sources to make our environment carbon-free.

Alstom's expertise and leading technologies help transforming the electrical grids to make them smarter, and help answer these challenges.

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We are shaping the future

Smart Distribution Networks: International Experience

11:00 - 12:45

@ MAIN THEATER

PANEL



Chair: Zbigniew A. Styczynski, Otto-von-Guericke University Magdeburg, Germany

Zbigniew A. Styczynski received his doctoral and habilitation degrees from Wroclaw University of Technology, Poland in 1977 and 1985, respectively. He taught at the Technical University of Stuttgart in Germany from 1991 to 1999. He then was appointed head of the Chair of Electric Power Networks and Renewable Energy Sources at the Otto-von-Guericke-University Magdeburg, Germany.

Dr. Styczynski is President of the Saxony-Anhalt Center for Renewable Energy (Z.E.R.E. Sachsen-Anhalt). He is also the President of the International Institute of Critical Infrastructure CRIS in Stockholm. At CRIS scientists from over 30 countries refine the optimum safety and efficiency of critical infrastructure in industrialized countries, including national electricity grids, European transport and logistics networks, and global communications networks. His special fields of interest include electric power networks and systems, expert systems and optimization problems.

Abstract

In many demonstration projects and field tests all over the world, smart distribution networks are designed, tested and analyzed. In this panel, practical experience from different countries is elaborated upon and compared. The contributions come from project consultants, network operators, and manufacturers from different countries to cover a broad spectrum of experience levels. E-Energy: Distributed Intelligence for Distributed Energy Systems Ludwig Karg, B.A.U.M. Consult, Germany

From Words to Action: Towards Smart Grids Solution in Sweden Viktoria Neimane, Vattenfall, Sweden

Insight From the Edge – Lessons From Large Scale Demand Side Management Projects Bastian Fischer, Oracle, Germany

The Smart Distribution Network Journey in the French Context Arnaud Ulian, Electricité Réseau Distribution France (ERDF), France

Smart Distribution for Distributed Energy Resource Management Matthias Muscholl, Alstom, Germany

Smart Grid Experience From Field Trials

11:00 - 12:45

@ H 1058

PAPER PRESENTATION

Chair: Alan Rotz, PPL Electric Utilities and IEEE PES Past President, USA

2012ISGTEU-105

Lessons Learned From the Texas Synchrophasor Network

Moses A. Kai (University of Texas at Austin, USA), W. Mack Grady (University of Texas at Austin, USA), David Costello (Schweitzer Engineering Laboratories, USA), Daniel Brooks (Electric Power Research Institute, USA), Jaime Ramos (University of Texas-Pan American, USA)

2012ISGTEU-104

LINEAR Breakthrough Project: Largescale Implementation of Smart Grid Technologies in Distribution Grids

Benjamin Dupont (KU Leuven, Belgium), Pieter Vingerhoets (KU Leuven, Belgium), Peter Tant (KU Leuven, Belgium), Koen Vanthournout (VITO, Belgium), Wim Cardinaels (VITO, Belgium), Tom De Rybel (KU Leuven, Belgium), Eefje Peeters (VITO, Belgium), Ronnie Belmans (KU Leuven, Belgium)

2012ISGTEU-291

Ecogrid EU – A Large Scale Smart Grids Demonstration of Real Time Market-based Integration of Numerous Small DER and DR

Yi Ding (Technical University of Denmark, Denmark), Preben Nyeng (Energinet.dk, Denmark), Jacob Østergaard (Technical University of Denmark), Maj Dang Trong (Energinet.dk, Denmark), Salvador Pineda (Technical University of Denmark, Denmark), Koen Kok (TNO, Netherlands), George B. Huitema (TNO, Netherlands), Ove S. Grande (SINTEF Energy Research Norway)

2012ISGTEU-059

Technical and Economic Analysis of Future Smart Grid Applications in the E-DeMa Project

Hans-Jörg Belitz (TU Dortmund, Germany), Sabine Winter (TU Dortmund, Germany), Christian Müller (TU Dortmund, Germany), Nils Langhammer (TU Dortmund, Germany), Rüdiger Kays (TU Dortmund, Germany), Christian Wietfeld (TU Dortmund, Germany), Christian Rehtanz (TU Dortmund, Germany)

2012ISGTEU-230

DG DemoNet: Experiences From Volt/ VAr Control Field Trials and Control Algorithm Advancements

Matthias Stifter (AIT, Austria), Roman Schwalbe (AIT, Austria), Werner Tremmel (AIT, Austria), Sawsan Henein (AIT, Austria), Helfried Brunner (AIT, Austria), Benoît Bletterie (AIT, Austria), Andreas Abart (Energie AG Oberösterreich Netz, Austria), Frank Herb (VKW Netz, Austria), Rudolf Pointner (Salzburg Netz, Austria)

Optimal Charging of Electric Vehicles I

11:00 - 12:45

@ H 0107

PAPER PRESENTATION

Chair: Akihiko Yokoyama, University of Tokyo, Japan

2012ISGTEU-290

Incorporating Valley Filling and Peak Shaving in a Utility Function Based Management of an Electric Vehicle Aggregator

Matthias D. Galus (ETH Zurich, Switzerland), Felix Wietor (ETH Zurich, Switzerland), Göran Andersson (ETH Zurich, Switzerland)

2012ISGTEU-088

Voltage Drop Charging of Electric Vehicles in a Residential Distribution Feeder

Frederik Geth (KU Leuven, Belgium), Niels Leemput (KU Leuven, Belgium), Juan Van Roy (KU Leuven, Belgium), Jeroen Büscher (KU Leuven, Belgium), Raf Ponnette (VITO, Belgium), Johan Driesen (KU Leuven, Belgium)

2012ISGTEU-091

Demand Side Management of Electric Vehicles With Uncertainty on Arrival and Departure Times

Frederik Ruelens (KU Leuven, Belgium), Stijn Vandael (KU Leuven, Belgium), Willem Leterme (KU Leuven, Belgium), Bert J. Claessens (VITO, Belgium), Maarten Hommelberg (VITO, Belgium), Tom Holvoet (KU Leuven, Belgium), Ronnie Belmans (KU Leuven, Belgium)

2012ISGTEU-072

Controlled Charging of Electric Vehicles in Residential Distribution Networks

Alison O'Connell (UCD, Ireland), Damian Flynn (UCD, Ireland), Peter Richardson (UCD, Ireland), Andrew Keane (UCD, Ireland)

2012ISGTEU-005 Hierarchical Charging Management Strategy of Plug-in Hybrid Electric Vehicles to Provide Regulation Service Shouxiang Wang (Tianjin University, China), Liang Han (Tianjin University, China), Dan Wang (Tianjin Electric Power Company China), Mohammad Shahidehpour (Illinois Institute of Technology, USA), Zuyi Li (Illinois

Institute of Technology, USA), Zuyi Li (

2012ISGTEU-112

Charging Control Model for Electric Vehicle Supplier Aggregator

Evangelos L. Karfopoulos (National Technical University of Athens, Greece), Charalampos E. Marmaras (National Technical University of Athens, Greece), Nikos Hatziargyriou (National Technical University of Athens, Greece)

Information and Communication Technology (ICT) for Smart Grids

11:00 - 12:45

@ H 0110

PAPER FORUM

Chair: Thomas Luckenbach, Fraunhofer FOKUS, Germany Co-Chair: Luis Ochoa, University of Manchester, UK

2012ISGTEU-087

ZigBee Wireless Area Network for Home Automation and Energy Management: Field Trials and Installation Approaches

N. C. Batista (University of Beira Interior, Portugal), R. Melício (University of Beira Interior, Portugal), J. C. O. Matias (University of Beira Interior, Portugal), J. P. S. Catalão (University of Beira Interior, Portugal)

2012ISGTEU-147

Device-to-device Communication for Smart Grid Devices

Simon Fey (HS Offenburg University of Applied Sciences, Germany), Pascal Benoit (Fraunhofer ISE, Germany), Gregor Rohbogner (Fraunhofer ISE, Germany), Andreas H. Christ (HS Offenburg University of Applied Sciences, Germany), Christof Wittwer (Fraunhofer ISE, Germany)

2012ISGTEU-026

The Power of Data: Data Analytics for M2M and Smart Grid

Zhong Fan (Toshiba, UK), Qipeng Chen (University of Bristol, UK), Georgios Kalogridis (Toshiba, UK), Siok Tan (Toshiba, UK), Dritan Kaleshi (University of Bristol, UK)

2012ISGTEU-037

Communication-control Concept in Distribution Network With Dispersed Energy Resource Jure Močnik (RC eNeM, Slovenia), Andrej

Žemva (University of Ljubljana, Slovenia)

2012ISGTEU-008 Dynamic Communications Control

for µGrid Agents

Jeff Frolik (University of Vermont, USA), Anthony L. Lentine (Sandia National Laboratories, USA), Andrew Seier (University of Vermont, USA), Chris Palombini (University of Vermont, USA)

2012ISGTEU-130 Hybrid Simulation of Power Systems

and ICT for Real-time Applications Sven C. Müller (TU Dortmund, Germany),

Hanno Georg (TU Dortmund, Germany), Christian Rehtanz (TU Dortmund, Germany), Christian Wietfeld (TU Dortmund, Germany)

2012ISGTEU-149

Communication interface Requirements During Critical Situations in a Smart Grid

Ines Hauer (Otto-von-Guericke University Magdeburg, Germany), André Naumann (Otto-von-Guericke University Magdeburg, Germany), Martin Stötzer (Otto-von-Guericke University Magdeburg, Germany), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Germany)

2012ISGTEU-286

A Critical Comparison of Approaches to Resource Name Management Within the IEC Common Information Model Nigel Hargreaves (Brunel University, UK),

Stefan Pantea (National Grid, UK), Gareth Taylor (Brunel University, UK), Malcolm Irving (Brunel University, UK)

2012ISGTEU-210 Algorithmic Approach to Data Model Versioning

Izudin Džafić (Siemens, Germany), Nenad Leček (Siemens, Germany)

2012ISGTEU-124

Infrastructure for Collaborating Dataresearchers in a Smart Grid Pilot

Wouter Labeeuw (KU Leuven, Belgium), Sven Claessens (VITO, Belgium), Kevin Mets (Ghent University, Belgium), Chris Develder (Ghent University, Belgium), Geert Deconinck (KU Leuven, Belgium)

2012ISGTEU-012

WiMAX for Smart Grid Last-mile Communications: TOS Traffic Mapping and Performance Assessment

Felipe Gómez-Cuba (Gradiant, Spain), Rafael Asorey-Cacheda (Universidade de Vigo, Spain), Francisco J. González-Castaño (Universidade de Vigo, Spain)

2012ISGTEU-221

A Comparison of Web Service Technologies for Smart Meter Data Exchange Markus Jung (Vienna University of Technology, Austria), Wolfgang Kastner (Vienna University of Technology, Austria), Georg Kienesberger (Vienna University of Technology,

Austria), Manuel Leithner (SBA, Austria)

2012ISGTEU-247

Object Oriented Topology Tracing for Large Scale Three Phase Distribution Networks

Izudin Džafić (Siemens, Germany), Sylwia Henselmeyer (Siemens, Germany), Nenad Lecek (Siemens, Germany), Thomas Schwietzke (Siemens, Germany), Dino Ablakovic (Siemens, Germany)

2012ISGTEU-228

High Performance Computing Platform for Advanced Distributed Network Operations

David Wallom (University of Oxford, UK), Stefano Salvini (University of Oxford, UK), Piotr Lopatka (University of Oxford, UK)

Demand Side Management of Distribution Networks

11:00 - 12:45

@ H 0111

PAPER PRESENTATION

Chair: Christian von Hirschhausen, TU Berlin, Germany

2012ISGTEU-047

Enabling Distributed Frequency Response Using Smart Meters

Lee J. Thomas (Cardiff School of Engineering, UK), Jianzhong Wu (Cardiff School of Engineering, UK), Janaka B. Ekanayake (Cardiff School of Engineering, UK), Nick Jenkins (Cardiff School of Engineering, UK)

2012ISGTEU-255

Using Flexible Energy Infrastructures for Demand Response in a Smart Grid City

Stamatis Karnouskos (SAP, Germany), Dejan Ilic (SAP, Germany), Per Goncalves Da Silva (SAP, Germany)

2012ISGTEU-095

Comparing Demand Side Management Approaches

Albert Molderink (University of Twente, Netherlands), Vincent Bakker (University of Twente, Netherlands), Johann L. Hurink (University of Twente, Netherlands), Gerard J.M. Smit (University of Twente, Netherlands)

2012ISGTEU-075

Self-learning Demand Side Management for a Heterogeneous Cluster of Devices With Binary Control Actions Bert J. Claessens (VITO, Belgium), Stijn Vandael (KU Leuven, Belgium), Frederik Ruelens (KU Leuven, Belgium), Maarten Hommelberg (VITO, Belgium)

2012ISGTEU-254

Indirect Control for Demand Side Management – A Conceptual Introduction Kai Heussen (Technical University of Denmark, Denmark), Shi You (Technical University of Denmark, Denmark), Benjamin Biegel (Aalborg University, Denmark), Lars H. Hansen (DONG Energy, Denmark), Katrine B, Andersen (DONG Energy, Denmark)

2012ISGTEU-043

A Predictive Control Scheme for Automated Demand Response Mechanisms loannis Lampropoulos (Eindhoven University of Technology, Netherlands), Paul P. J. van den Bosch (Eindhoven University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands)

2012ISGTEU-113

A Modified Approach for Residential Load Scheduling Using Smart Meters Shahab Bahrami (Sharif University of Technology, Iran), Mostafa Parniani (Sharif University of Technology, Iran), Ahmadreza Vafaeimehr (European Business School, Germany)

Impact of Power Electronics Control

11:00 - 12:45

@ H 0112

PAPER PRESENTATION

Chair: George G. Karady, Arizona State University, USA

2012ISGTEU-162

Fulfilling the Standard EN 50160 in Distribution Networks With a High Penetration of Renewable Energy System Christian Röhrig (Otto-von-Guericke University Magdeburg, Germany), Krzysztof Rudion (Otto-von-Guericke University Magdeburg, Germany), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Germany), Hans-Joachim Nehrkorn (E.ON, Germany)

2012ISGTEU-276

Implementation of Grid-friendly Charging Scheme to Electric Vehicle Off-board Charger for V2G

Yutaka Ota (University of Tokyo, Japan), Haruhito Taniguchi (University of Tokyo, Japan), Hirokazu Suzuki (University of Tokyo, Japan), Tatsuhito Nakajima (Tokyo Electric Power Company, Japan), Jumpei Baba (University of Tokyo, Japan), Akihiko Yokoyama (University of Tokyo, Japan)

2012ISGTEU-027 Current Harmonics and Commercial Losses in Smart Grids

Anatoly M. Lipsky (Ariel University Center of Samaria, Israel), Neda V. Miteva (Ariel University Center of Samaria, Israel), Efim S. Lokshin (Ariel University Center of Samaria, Israel)

2012ISGTEU-089

Exploring the Range of Impedance Conditioning by Virtual Inductance for Grid Connected Voltage Source Converters

Jon Are Suul (SINTEF Energy Research, Norway), Marta Molinas (Norwegian University of Science and Technology, Norway), Pedro Rodríguez (Abengoa Research, Spain)

2012ISGTEU-004

Damping Power System Oscillations Using Phase Imbalanced Series Capacitive Compensation and DFIGbased Wind Farms

Irfan Unal (University of Saskatchewan, Canada), Sherif O. Faried (University of Saskatchewan, Canada) Wednesday

Tuesday



Women in Engineering Event

12:45 - 14:00

ATRIUM

WOMEN IN ENGINEERING PROGRAM



Moderator: Noel Schulz, IEEE PES President and Kansas State University, USA Invited Speaker: Li Xiaolin, China Power International New Energy, China

IEEE Women in Engineering (WIE) is dedicated to promoting women engineers and scientists. IEEE PES President Professor Noel Schulz outlines the mission and vision of the IEEE PES activities of Women in Engineering.



The invited speech of the IEEE PES ISGT Europe 2012 Women in Engineering event is delivered by Ms. Li Xiaolin. Her contribution is under the motto: Bring Elegance and Dream Into Engineering and Management. At first, Ms. Li talks about the possibility of career development of Chinese women in engineering and in China. Then, on behalf of successful woman leaders in engineering and based on her own experience, Ms. Li introduces how women can gain recognition in engineering and make progress in career development.

Ms. Li graduated from Tsinghua University, majoring in electric power system and automation, and got a master's degree in engineering. She was a visiting scholar to Sloan Management School of Massachusetts Institute of Technology in the United States. Ms. Li Xiaolin speaks as Chairwoman of both China Power International Holding Ltd. and China Power International Development Ltd. She is Chairwoman of directors of China Power New Energy Development Ltd., a board director of Companhia de Electricidade de Macau, and an executive director of the Hong Kong Chinese Enterprises Association. Ms. Li has worked in electric sector for more than 20 years and won numerous awards. In 2009, she was ranked "Top 50 Global Women CEOs" by Time magazine. In 2010, she was elected one of "Top 50 Global Business Women" by Fortune magazine for the second time. In 2011, she was selected as one of "Energy Figures in 2010-2011", one of "Top 10 Models in 30 Years' Enterprise Culture Practice", and one of "2011 CCTV China Economic Annual Figures".



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China Power International New Energy Holding Ltd. (CPINE) was established in Shanghai in December, 2006 by China Power International Limited, a key enterprise under China Power Investment Corporation, one of top five largest power generation groups. CPINE is a new energy enterprise established within the framework of "Three Step Strategy" in China Power Investment and "developing the new energy industry in a better and faster way" by the Chainwoman Ms. Xiaolin Li in China Power International Limited. Core business areas of CPINE include wind power, biomass power, hydropower, natural gas power, solar power, etc...

The development strategy of CPINE is: to support small and medium sized hydropower, vigorously develop wind power, moderately develop biomass power, develop natural gas power at certain regions and be ready to develop solar power, tidal power and other renewable power projects of strategic significance at an appropriate time while selectively enter equipment manufacturing and service areas associated to new energy, create three major industries, including new energy generation, new energy and smart grid, energy saving and environmental protection, as the mainstay of the world-class new energy group.

The capital platform of CPINE is the Hong Kong-listed China Power New Energy Development Company Limited (Stock Code: 0735.HK). By the end of June, 2012, CPINE has had an installed capacity of nearly 1630.3MW, and more than 300MW has been under construction and development. The Cumulative generating capacity is more than 14,836,000,000 kWh, and the profit is nearly 1,000,000,000 RMB. Compared with conventional coal-fired power plant, it has reduced the use of about 4,906,200 tons of standard coal, and reduced sulfur dioxide emissions by 372,700 tons.

Moving the Smart Grid Forward: Perspectives for R&D

14:00 - 15:45

@ MAIN THEATER

PANEL



Chair: Saifur Rahman, Director of Virginia Tech Advanced Research Institute, USA

Saifur Rahman is the Founding Director of the Advanced Research Institute at Virginia Tech where he is the Joseph R. Loring Professor of Electrical and Computer Engineering. He also directs the Center for Energy and the Global Environment. He is a Fellow of the IEEE. He was the founding editor-in-chief of the IEEE Transactions on Sustainable Energy. He is a vice president of the IEEE Power and Energy Society (PES) and a member-at-large of the IEEE-USA Energy Policy Committee.

Currently, Dr. Rahman is serving as the chair of the US National Science Foundation Advisory Committee for International Science and Engineering. He is a Distinguished Lecturer for the IEEE PES, and has lectured on smart grid, energy efficient lighting solutions, renewable energy, demand response, distributed generation and critical infrastructure protection topics in over 30 countries on all six continents.

Abstract

Finding the right directions of research and development can very much facilitate the transition to a renewable energy supply via smart grid technology. In this context, it is of interest to consider the international dimension of the involved challenges. In this panel, experts from industry, science and government present thematic priorities for future R&D. With contributions from Europe, China, and the USA, a comprehensive international view on smart grid R&D perspectives is created. This panel is established in cooperation with the German Federal Department of Economics and Technology. Smart Grids Challenges and Perspectives for R&D Arne Höll, German Federal Ministry of Economics and Technology, Germany

A TSO Perspective for Research & Development Priorities on European Transmission Systems Hubert Lemmens, Elia, Belgium

The Smart Grid Vision and Strategy of the European Institute of Technology EIT ICT Labs Ariane Sutor, Siemens, Germany

Smart Grid R&D Perspectives From the USA Miroslav Begovic, Georgia Institute of Technology, USA

The National Priority Basic Research Project in China: Smart Grid Energy Management and Control Hongbin Sun, Tsinghua University, China

HVDC and Offshore Wind Park Connection

14:00 - 15:45

@ H 1058

PAPER PRESENTATION

Chair: Gert Schwarzbach, 50Hertz, Germany

2012ISGTEU-042

Low Frequency High Voltage Offshore Grid for Transmission of Renewable Power Wilfried Fischer (50Hertz, Germany), Rainer Braun (Deutsche Bahn Energie, Germany), István Erlich (University of Duisburg-Essen, Germany)

2012ISGTEU-166

Reactive Power Compensation in Hybrid AC/DC Networks for Smart Grid Applications

Ahmed Mohamed (Florida International University, USA), Vahid Salehi (Florida International University, USA), Osama Mohammed (Florida International University, USA)

2012ISGTEU-219

Experimental Implementation of a Voltage Control for a Multiterminal VSC-HVDC Offshore Transmission System

Agustí Egea-Alvarez (U. Politecnica de Catalunya, Spain), Fernando Bianchi (IREC, Spain), Adria Junyent-Ferré (U. Politecnica de Catalunya, Spain), Gabriel Gross (U. Politecnica de Catalunya, Spain), Oriol Gomis-Bellmunt (U. Politecnica de Catalunya, Spain)

2012ISGTEU-128

Improving Ranking of Electric Power System Dynamic Behavior in DSA System by Applying VSC Based HVDC Technology Cuong Nguyen Mau (Otto-von-Guericke University Magdeburg, Ger.), Ngoc T. Trinh (Siemens, Ger.), Krzysztof Rudion (Ottovon-Guericke University Magdeburg, Ger.), Edwin Lerch (Siemens, Ger.), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Ger.)

2012ISGTEU-066

VSC-HVDC Link to Support Voltage and Frequency Fluctuations for Variable Speed Wind Turbines for Grid Connection Ronan Meere (Athlone Institute of Technology, Ireland), Mark O'Malley (UCD, Ireland), Andrew Keane (UCD, Ireland)

2012ISGTEU-199

An Analytical Method for Probabilistic Load Flow Applied to Multi-terminal HVDC Networks for Offshore Wind Farm Integration

Emanuele Ciapessoni (RSE, Italy), Diego Cirio (RSE, I.), Andrea Pitto (RSE, I.), Stefano Massucco (University of Genova, I.), Federico Silvestro (University of Genova, I.)

2012ISGTEU-099

Power Flow Participation by an Embedded HVDC Grid in an Interconnected Power System Anne-Katrin Marten (TU Ilmenau, Germany), Dirk Westermann (TU Ilmenau, Germany)

Optimal Charging of Electric Vehicles II

14:00 – 15:45

@ H 0107

PAPER PRESENTATION

Chair: Antonio C. S. Lima, Federal University of Rio de Janeiro, Brazil

2012ISGTEU-240

Coordinated Electric Vehicle Charging Strategy for Optimal Operation of Distribution Network

Kaiqiao Zhan (Tsinghua University, China),
Zechun Hu (Tsinghua University, China),
Yonghua Song (Tsinghua University, China),
Zhuowei Luo (Tsinghua University, China),
Zhiwei Xu (Tsinghua University, China), Long
Jia (Tsinghua University, China)

2012ISGTEU-025

Urgency-driven, Plug-in Electric Vehicle Charging

Jeff Frolik (University of Vermont, USA), Paul D. H. Hines (University of Vermont, USA)

2012ISGTEU-118

An Optimal Local Charging Strategy for Competing Electric Vehicles on Quick Charging Facilities

Cédric Bodet (NEC Laboratories Europe, Germany), Rafał Jabłonowski (NEC Laboratories Europe, Germany), Kellie Erickson (NEC Laboratories Europe, Germany), Anett Schülke (NEC Laboratories Europe, Germany)

2012ISGTEU-100

Strong Stochastic Approach to Assess Impacts of Electric Vehicles on the Distribution Network

Tuan Tran-Quoc (CEA-INES, France), Xavier Le Pivert (CEA-INES, France), Mehdi Saheli (Renault, France), Olivier Beaude (Renault, France)

2012ISGTEU-212

Validation of Voltage Regulation Method in Distribution System Utilizing Electric Vehicles

Yuki Mitsukuri (Hokkaido University, Japan), Ryoichi Hara (Hokkaido University, Japan), Hiroyuki Kita (Hokkaido University, Japan), Eiji Kamiya (Tokyo Electric Power Company, Japan), Yasuhiro Kataoka (Tokyo Electric Power Company, Japan), Shoji Taki (Tokyo Electric Power Company, Japan), Eiji Kogure (Tokyo Electric Power Company, Japan)

2012ISGTEU-287

On the Interdependence of Intelligent Charging Approaches for Plug-in Electric Vehicles in Transmission and Distribution Networks

Marina González Vayá (ETH Zurich, Switzerland), Matthias D. Galus (ETH Zurich, Switzerland), Rashid A. Waraich (ETH Zurich, Switzerland), Göran Andersson (ETH Zurich, Switzerland)

Distribution System Modeling and Analysis

14:00 - 15:45

@ H 0110

PAPER FORUM

Chair: Wil L. Kling, Eindhoven University of Technology, Netherlands Co-Chair: Emanuel Rashayi, University of Zimbabwe, Zimbabwe

2012ISGTEU-266

Integrated Reliability Modeling for Data Center Infrastructures: A Case Study Uwe Müller (ibmu.de, Germany), Kai Strunz (TU Berlin, Germany)

2012ISGTEU-256

Analysis of Thevenin Equivalent Network of a Distribution System for Solar Integration Studies

Guangya Y. Yang (Technical University of Denmark, Denmark), Majken R. Mattesen (Østkraft, Denmark), Søren B. Kjær (Danfoss Solar Inverter, Denmark), Radu D. Lazar (Danfoss Solar Inverter, Denmark), Adrian Constantin (Danfoss Solar Inverter, Denmark), Jacob Østergaard (Technical University of Denmark, Denmark), Carl Stephansen (EnergiMidt, Denmark)

2012ISGTEU-235

Simplified Modeling of DFIG With PWM Nonlinear Characteristics for Fast Transient Simulation

Yin Xu (Tsinghua University, China), Laijun Chen (Tsinghua University, China), Ying Chen (Tsinghua University, China), Zhenquan Sun (Shaanxi Regional Electric Power, China)

2012ISGTEU-237 Modeling the Frequency Response of Photovoltaic Inverters

Ernauli C. Aprilia (Eindhoven University of Technology, Netherlands), Vladimir Cuk (Eindhoven University of Technology, Netherlands), Sjef Cobben (Eindhoven University of Technology, Netherlands), Paulo F. Ribeiro (Eindhoven University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands)

2012ISGTEU-246

Modeling of Auto-transformers for Load Flow Calculations

Hans-Theo Neisius (Siemens, Germany), Izudin Džafić (Siemens, Germany), Sylwia Henselmeyer (Siemens, Germany), Dino Ablakovic (Siemens, Germany), Nenad Leček (Siemens, Germany)

2012ISGTEU-009

Hybrid Three-phase Load Flow Method for Ungrounded Distribution Systems

Hongbo Sun (Mitsubishi Electric, USA), Daniel Nikovski (Mitsubishi Electric, USA), Tetsufumi Ohno (Mitsubishi Electric, Japan), Tomihiro Takano (Mitsubishi Electric, Japan), Yasuhiro Kojima (Mitsubishi Electric, Japan)

2012ISGTEU-245

Three Phase Current Iteration Power Flow Method Using Fortescue Transformations

Izudin Džafić (Siemens, Germany), Hans-Theo Neisius (Siemens, Germany), Sylwia Henselmeyer (Siemens, Germany)

2012ISGTEU-157

Increase of the Delivered Energy Probability in DES Using a Fuzzy Probabilistic Modeling

Bruno Canizes (Polytechnic of Porto, Portugal), João Soares (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic of Porto, Portugal), Joaquim Teixeira (Polytechnic of Porto, Portugal)

2012ISGTEU-257

Representation and Self-configuration of Physical Entities in Extended Smart Grid Perimeter

Zheng Hu (Orange, France), Gilles Privat (Orange, France), Stéphane Frénot (INSA-Lyon, France), Bernard Tourancheau (IMAG, France)

2012ISGTEU-144 Controlling Smart Grid Adaptivity

Hermen A. Toersche (University of Twente, Netherlands), Stefan Nykamp (University of Twente, Netherlands), Albert Molderink (University of Twente, Netherlands), Johann L. Hurink (University of Twente, Netherlands), Gerard J. M. Smit (University of Twente, Netherlands)

2012ISGTEU-161

Parametric Interface for Battery Energy Storage Systems Providing Ancillary Services

Claudio R. Vergara (Universidade do Porto, Chile)

2012ISGTEU-111

A Synchronous Reference Frame Intelligent Structure for Power Control of Distributed Generators in a Microgrid Sima Seidi Khorramabadi (Queen's University, Canada), Alireza Bakhshai (Queen's University, Canada)

2012ISGTEU-103

Agent Based Automation for a Smarter Distribution Grid

Mariam Khattabi (MW, Germany), Andreas Kießling (MW, Germany), Patrick Selzam (Fraunhofer IWES, Germany), Jan Ringelstein (Fraunhofer IWES, Germany)

2012ISGTEU-184

Optimal Economic Operation of Smart Grid by Fuzzy Advanced Quantum Evolutionary Method

Shantanu Chakraborty (Nagoya Institute of Technology, Japan), Takayuki Ito (Nagoya Institute of Technology, Japan), Tomonobu Senjyu (University of the Ryukyus, Japan)

2012ISGTEU-031

Day-ahead and Online Scheduling of a Power Park in Urban Electricity Infrastructure

Ehsan Abbasi (TU Berlin, Germany), Hossein Ameli (TU Berlin, Germany), Kai Strunz (TU Berlin, Germany)

Islanding Detection and Operation

14:00 - 15:45

@ H 0111

PAPER PRESENTATION

Chair: Omer Usta, Istanbul Technical University, Turkey

2012ISGTEU-142

Evaluation of Non-active Current Compensation in Smart Grids

Santiago Sanchez Acevedo (Norwegian University of Science and Technology, Norway), Marta Molinas (Norwegian University of Science and Technology, Norway)

2012ISGTEU-211

Autonomous Control of Electric Vehicles in Grid-connected and Islanded Modes Arnaldo Arancibia (TU Berlin, Germany), Kai Strunz (TU Berlin, Germany)

2012ISGTEU-057

New Multi-criteria-based Algorithm for Islanding Detection in Smart Grids Hannu Laaksonen (ABB, Finland)

2012ISGTEU-085

Islanding Detection in a Distributed Generation Based Hybrid System Using Intelligent Pattern Recognition Techniques

S. R. Mohanty (University of Beira Interior, Portugal), Nand Kishor (Motilal Nehru National Institute of Technology, India), P. K. Ray (Motilal Nehru National Institute of Technology, India), J. P. S. Catalão (University of Beira Interior, Portugal)

2012ISGTEU-214 Islanding Detection for PV and DFIG Using Decision Tree and AdaBoost Algorithm

Seyed S. Madani (Sharif University of Technology, Iran), Ali Abbaspour (Sharif University of Technology, Iran), Mojtaba Beiraghi (Sharif University of Technology, Iran), Payam Zamani Dehkordi (Sharif University of Technology, Iran), Ali M. Ranjbar (Sharif University of Technology, Iran)

2012ISGTEU-044

Investigation of the Virtual Synchronous Machine in the Island Mode

Yong Chen (TU Clausthal, Germany), Ralf Hesse (Ingenieurbüro IEHW, Germany), Dirk Turschner (TU Clausthal, Germany), Hans-Peter Beck (TU Clausthal, Germany)

Wide Area Transient Control and Stability Improvement With PMU

14:00 - 15:45

@ H 0112

PAPER PRESENTATION

Chair: Martin Wolter, 50Hertz, Germany

2012ISGTEU-053

New Applications for Wide-area Monitoring, Protection and Control Sven C. Müller (TU Dortmund, Germany), Andreas Kubis (TU Dortmund, Germany), Sebastian Brato (TU Dortmund, Germany), Ulf Häger (TU Dortmund, Germany), Christian Rehtanz (TU Dortmund, Germany), Jürgen Götze (TU Dortmund, Germany)

2012ISGTEU-277

Improvement of Angle and Voltage Stability by Control of Batteries Using Wide-area Measurement System in Power Systems

Kenichi Kawabe (University of Tokyo, Japan), Akihiko Yokoyama (University of Tokyo, Japan)

2012ISGTEU-148

Power Grid Transient Stability Prediction Using Wide Area Synchrophasor Measurements

Jagabondhu Hazra (IBM, India), Ravi K. Reddi (IIT Kharagpur, India), Kaushik Das (IBM, India), Deva P. Seetharam (IBM, India), Avinash K. Sinha (IIT Kharagpur, India)

2012ISGTEU-055 Synchronous Machine Inertia Constants Updating Using Wide

Area Measurements Song Guo (Durham University, UK), Janusz Bialek (Durham University, UK)

2012ISGTEU-242 A Modified Taylor-Kalman Filter for Instantaneous Dynamic Phasor Estimation

Junqi Liu (RWTH Aachen, Germany), Fei Ni (RWTH Aachen, Germany), Junjie Tang (RWTH Aachen, Germany), Ferdinanda Ponci (RWTH Aachen, Germany), Antonello Monti (RWTH Aachen, Germany)

2012ISGTEU-117

Implementation of Power System Model Identification for Locating In-phase Generators

Pavel V. Chusovitin (Ural Federal University, Russia) and Andrey V. Pazderin (Ural Federal University, Russia)

Economics of Smart Grids With Renewables

16:15 - 18:00

@ MAIN THEATER

PANEL



Chair: Oliver Weinmann, Vattenfall, Germany

Oliver Weinmann is Managing Director of Vattenfall Europe Innovation GmbH. As a subsidiary of Vattenfall Europe, the enterprise focuses on strategic business development and steering of activities in the field of product and technology development for the Vattenfall Europe Group. Dr. Weinmann studied Process Engineering at the RWTH Aachen University, followed by a Ph.D. on Solar Thermal Power Plants at DLR in Cologne. In 1992 he started his career at HEW in Hamburg.

Dr. Weinmann moved to Vattenfall in 2003 as Head of Innovation Management. In parallel, between 2004 and 2007, he was Managing Director of Vattenfall Europe Renewables GmbH and built up of the renewable energy business in the Vattenfall Europe Group. In 2010 he was appointed as Managing Director of Vattenfall Europe Innovation GmbH. The core projects deal with topics such as E-Mobility, Hydrogen Issues, Storage Potential, Smart Systems.

Abstract

Beyond technology, the economics and business ideas must also be innovative to bring success for smart grids. This panel focusses on economics and business modeling. In order to identify the challenges and solutions, the topics covered include the economics of renewable energy integration, smart regulatory schemes, the analysis of new concepts, and the concrete application to the usage of battery energy storage. On the Economics of Renewables Ottmar Edenhofer, Potsdam Institute of Climate Impact Research, Germany

Challenges for the Market Integration for Renewables and Smart Grids Anke Weidlich, HS Offenburg University of Applied Sciences, Germany

Smart Regulation for Smart Grids in Germany Eric Ahlers, BDEW, Germany

Challenges for Business Modeling and Analysis of New Concepts – to See Beyond the Technology Jan Markendahl, KTH Stockholm, Sweden

Battery Energy Storage Systems for Renewable Energy Integration Eric Sortomme, Alstom, USA

Microgrids: Building Blocks of the Smart Grid

16:15 - 18:00

@ H 1058

PANEL



Chair: Nikos Hatziargyriou, National Technical University of Athens, Greece

Nikos D. Hatziargyriou is Professor at the Power Division of the Electrical and Computer Engineering Department of NTUA. From February 2007 to August 2012, he was Deputy CEO of the Public Power Corporation (PPC) of Greece, responsible for Transmission and Distribution Networks, island DNO and the Center of Testing, Research and Prototyping.

Dr. Hatziargyriou is Fellow Member of IEEE, past Chair of the Power System Dynamic Performance Committee and Chair of CIGRE SCC6. He was member of the EU Advisory Council of the Technology Platform on Smart Grids. He has participated in more than 60 R&D Projects, and was coordinator of the EU funded "Care", "More Care", "Rise", "Microgrids", "More Microgrids" and "Merge". He is author of more than 250 scientific publications. His research interests include Smartgrids, Microgrids, Distributed and Renewable Energy Sources and Power System Security.

Abstract

Microgrids are low and medium voltage distribution networks comprising various distributed energy resources (DER), namely distributed generators (DG) and storage devices together with controllable or flexible loads that can operate either interconnected and/or isolated from the main distribution grid as a controlled entity. Microgrids provide an innovative way to unlock the full potential of the installed DER by coordinating their operation at the local distribution level and thus maximizing their benefits. Thus, Microgrids are considered by several utilities around the world as fundamental Building Blocks in the design and planning of Smart Grids. Panelists will debate the issues of sustainability achieved by Microgrids, will present and propose solutions to the technical challenges and will illustrate practical experiences.

The Fort Collins Renewable and Distributed Systems Integration Project in Colorado Siddharth Suryanarayanan, Colorado State University, USA

Microgrid: The Technology Issues and Environmental-Economic Benefits Saifur Rahman, Virginia Tech Advanced Research Institute, USA

Coordination of Multi-Microgrids João A. Peças Lopes, INESC Porto, Portugal

Adaptive Protection Schemes for Microgrids Enrico Ragaini, ABB, Italy

Stabilizing the Graciosa Island Grid With Many Renewables but Without Diesel Engines Carsten Reincke-Collon, Younicos, Germany

Planning of Smart Grids

16:15 - 18:00

@ H 0107

PAPER PRESENTATION

Chair: Hamid Zareipour, University of Calgary, Canada

2012ISGTEU-283

On the Optimal Placement of Distributed Storage Systems for Voltage Control in Active Distribution Networks

Mostafa Nick (EPFL, Switzerland), Marc Hohmann (EPFL, Switzerland), Rachid Cherkaoui (EPFL, Switzerland), Mario Paolone (EPFL, Switzerland)

2012ISGTEU-129

Optimal Degree of Smart Transformer Substations in Distribution Networks for Reliability Improvement

Andrea Rodriguez-Calvo (Comillas Pontifical University, Spain), Pablo Frías (Comillas Pontifical University, Spain), Javier Reneses (Comillas Pontifical University, Spain), Carlos Mateo (Comillas Pontifical University, Spain)

2012ISGTEU-023

A Multi-objective Planning Framework for Optimal Integration of Distributed Generations

Keshav Pokharel (University of Central Lancashire, UK), Maizura Mokhtar (University of Central Lancashire, UK), Joe Howe (University of Central Lancashire, UK)

2012ISGTEU-110

Optimization of Supply Source Allocation in the Problem of Rational Configuration of Electricity Supply System

Olga V. Svezhentseva (Irkutsk State Technical University, Russia), Nikolay I.Voropai (Melentiev Energy Systems Institute, Russia)

2012ISGTEU-248

The Smart Super-European Grid: Balancing Demand and Supply

Catalina Spataru (University College of London, UK), Mark Barrett (University College of London, UK)

2012ISGTEU-233

Integrating Wind – Influence of Transmission Grid Extension on European Electricity Market Prices

Tobias Aigner (Norwegian University of Science and Technology, Norway), Katrin Schaber (TU München, Germany), Thomas Hamacher (TU München, Germany), Terje Gjengedal (Norwegian University of Science and Technology, Norway)

Methods for Integration of Wind Energy

16:15 – 18:00

@ H 0110

PAPER PRESENTATION

Chair: Raphael Caire, INP Grenoble, France

2012ISGTEU-177 Development of Wind Power Stabilization System Using BESS and STATCOM

Duck-Su Lee (Hyundai, Korea), Soo-Nam Kim (Hyundai, Korea), Young-Chan Choi (Hyundai, Korea), Byung-San Baek (Hyundai, Korea), Jong-Sung Hur (Hyundai, Korea)

2012ISGTEU-217

Analysis of Wind Power Integration Capacity in Wind-hydro-thermal Hybrid Power System

Can Sun (Xi'an Jiaotong University, China), Zhaohong Bie (Xi'an Jiaotong University, China), Gengfeng Li (Xi'an Jiaotong University, China), Bowen Hua (Xi'an Jiaotong University, China)

2012ISGTEU-076

Probabilistic Assessment of Operational Risk Considering Different Wind Turbine Technologies

Francisco M. Gonzalez-Longatt (Coventry University, UK), José L. Rueda (University of Duisburg-Essen, Germany), Dimitar Bogdanov (Technical University of Sofia, Bulgaria)

2012ISGTEU-153

Exploring the Use of Flexibility Indices in Low Carbon Power Systems

Juan Ma (University of Manchester, UK), Vera Silva (EDF, France), Régine Belhomme (EDF, France), Daniel S. Kirschen (University of Washington, USA), Luis F. Ochoa (University of Manchester, UK)

2012ISGTEU-090 Impact of Different DFIG Wind Turbines Control Modes on Long-term Voltage Stability

Rafael R. Londero (Federal University of Pará, Brazil), Carolina M. Affonso (Federal University of Pará, Brazil), João P. Abreu Vieira (Federal University of Pará, Brazil), Ubiratan H. Bezerra (Federal University of Pará, Brazil)

2012ISGTEU-253

Dynamic Participation of Wind Farms in System Frequency Control

Mohammadreza Toulabi (Sharif University of Technology, Iran), Ali Mohammad Ranjbar (Sharif University of Technology, Iran), Houshang Karimi (Sharif University of Technology, Iran), Mojtaba Shiroie (Sharif University of Technology, Iran)

Advances to Real-time State Estimation

16:15 - 18:00

@ H 0111

PAPER PRESENTATION

Chair: Saša Z. Djokić, University of Edinburgh, UK

2012ISGTEU-145

Real-time Hybrid State Estimation Incorporating SCADA and PMU Measurements

Kaushik Das (IBM, India), Jagabondhu Hazra (IBM, India), Deva P. Seetharam (IBM, India), Ravi K. Reddi (IIT Kharagpur, India), Avinash K. Sinha (IIT Kharagpur, India)

2012ISGTEU-138

Synchro-Phasor Based Three Phase State Estimation Using Modal Components

Murat Göl (Northeastern University, Boston, USA), Ali Abur (Northeastern University, Boston, USA)

2012ISGTEU-183

An Optimal Hierarchical Algorithm for Factored Nonlinear Weighted Least Squares State Estimation

George M. Mathews (NICTA, Australia)

2012ISGTEU-194

Distribution System State Estimation Using Unsynchronized Phasor Measurements

Pierre Janssen (Université Libre de Bruxelles, Belgium), Tevfik Sezi (Siemens, Germany), Jean-Claude Maun (Université Libre de Bruxelles, Belgium)

2012ISGTEU-267

State Estimation of Active Distribution Networks: Comparison Between WLS and Iterated Kalman-filter Algorithm Integrating PMUs

Stela Sarri (EPFL, Switzerland), Mario Paolone (EPFL, Switzerland), Rachid Cherkaoui (EPFL, Switzerland), Alberto Borghetti (University of Bologna, Italy), Fabio Napolitano (University of Bologna, Italy), Carlo A. Nucci (University of Bologna, Italy)

2012ISGTEU-094

A Case Study of Bad Data Detection for Distribution Feeder Voltage Measurement

Naotaka Okada (Central Research Institute of Electric Power Industry, Japan), Masahiro Takasaki (Central Research Institute of Electric Power Industry, Japan), Kazuyuki Tanaka (Central Research Institute of Electric Power Industry, Japan)

Conference Dinner

19:30 - 23:00

POSTBAHNHOF

EVENING PROGRAM



The Organization Team gratefully acknowledges the help offered by Platinum Supporter China Power International New Energy (CPINE) Holding Ltd. for this Conference Dinner.

Honorary guests of the dinner are Ms. Li Xiaolin, President of CPINE and Honorary Co-Chair of Organization of ISGT Europe 2012, and Dr. h. c. Lothar de Maizière, Co- President of the Petersburg Dialogue and the last prime minister of former GDR.



Ms. Li will offer Welcome Words on behalf of CPINE and give the keynote speech with the title: **Opportunities for Co-operative Development of Sustainable Energy.**

The musical entertainment is offered by Benschu & Intrau. Member Ralf Benschu became known as a long-term member of the band Keimzeit.

Postbahnhof is a former railway post office built in1907 to 1908. It once was one of the most significant post offices of Germany. Today, it is a protected monument and popular for events. More information is available under www.postbahnhof.de . Access to Postbahnhof is described in the section Conference Program Elements.





	Main Theater	H1058	H0107	H0110	H0111	H0112
8:30	PANEL	PANEL	PAPER PRESENTATION	PAPER FORUM	PAPER PRESENTATION	PAPER PRESENTATION
	Chair: Johanna Myrzik	Chair: Malcolm Irving	Chair: Kwang Y. Lee	Chair: Carlo A. Nucci	Chair: Federico Silvestro	Chair: Susanne Landt
	Smart Cities	Novel State Estimation	Microgrids Operation	Research Projects	Concepts of Smart	Smart Grid Maintenance
		for Smart Distribution	and Control	at National and	Grid Security	and Asset Management
		and Transmission Net-		International Level		
10:15		work Operation				
10:15		10:15 - 11:00 COFFEE BREAK				
	-					
11:00	PANEL	PAPER PRESENTATION	TUTORIAL	PAPER FORUM	PAPER PRESENTATION	PAPER PRESENTATION
	11:00, p. 96	11:00, p. 98	11:00, p. 99	11:00, p. 100	11:00, p. 102	11:00, p. 103
	Chair: Georg Lauss	Chair: Suresh & Verma	Chair: Eric Sortomme	Chair: Stephen D. J. MicArthur	Chair: Andreas Lugmaier	Chair: Jochen Schafer
	of Smart Gride	of Electric Vehicles	Emerging Smart Grid: Im-	and Identification	voltage Control	Large-scale Impact
	or Smart Grids	of Electric Vehicles	ment System Incorporating	Systems for Smart Grids		Management
			Advanced Solutions	and Homes		management
12:45	_					
		12:45 - 14:00 LUNCH BREAK				
14:00	PANEL	PAPER PRESENTATION	PAPER PRESENTATION	PAPER FORUM	PAPER PRESENTATION	PAPER PRESENTATION
	14:00, p. 104	14:00, p. 106	14:00, p. 107	14:00, p. 108	14:00, p. 110	14:00, p. 111
	Chair: Lina Bertling Tjernberg	Chair: Heiko Lehmann	Chair: Pieter Vingerhoets	Chair: Osama Mohammed	Chair: Hongbin Sun	Chair: Debora Coll-Mayor
	Hydroelectric Power	Tariffs and Customer	Energy Management of	Real-time Modeling and	Methods of Modeling	Methods for Integration
	Generation From Scan-	Relations	Systems With Battery	Laboratories of Smart	Uncertainty and	of Photovoltaics
	dinavia in the Future		Storage	Grids	Reliability	
	European Smart Grid					
15:30						
	_	15:30 – 16:00 COFFEE BREAK				
16:00	PANEL	PAPER PRESENTATION	PAPER PRESENTATION	PAPER FORUM	PAPER PRESENTATION	PAPER PRESENTATION
	16:00, p. 112	16:00, p. 114	16:00, p. 115	16:00, p. 116	16:00, p. 118	16:00, p. 119
	Chair: Gérald Sanchis	Chair: Matthias D. Galus	Chair: Janusz Bialek	Chair: William D. Rosehart	Chair: Parimal Acharjee	Chair: Dirk Westermann
	Pathways to a	Energy Management in	Management of Electric	Energy Management	Modeling of Load and	Optimal Power Flow
	European Smart Grid	Smart Homes	Vehicles	of Systems With Heat	Battery Resources	Control via Dispatching,
				Pumps and Thermal		Demand Response, and
				Storage		Reconfiguration
17:30	PLENARY 17:30, p. 120 Conf	erence Closing				

PLENARY 17:30, p. 120 Conference Closing

Smart Cities

08:30 - 10:15

@ MAIN THEATER

PANEL



Chair: Johanna Myrzik, University of Dortmund, Germany

Johanna M. A. Myrzik has been a Full Professor at TU Dortmund, Institute of Energy Systems, Energy Efficiency and Energy Economic since September 2009. She received her MSc. in Electrical Engineering from Darmstadt University of Technology, Germany, in 1992. From 1993 to 1995, she worked as a researcher at the Institute for Solar Energy Supply Technology (ISET e.V.) in Kassel, Germany. In 1995, Dr. Myrzik joined the Kassel University, where she finished her Ph.D. thesis in the field of solar inverter topologies in 2000. In 2000, Dr. Myrzik joined Eindhoven University of Technology, Netherlands. In 2002 and in 2008 she became an assistant professor and an associate professor, respectively. Her fields of interests are energy efficiency, urban energy supply, power electronics and power quality.

Abstract

In the framework of Smart Grids, Smart Cities take a particular role. Cities have a high and still increasing demand on electricity, gas, heating and cooling simultaneously. Therefore, intelligent energy management systems considering sustainability aspects, reliability, affordability and CO2 reduction are needed in order to keep a healthy environment and welfare. Through the complexity of this topic, a number of aspects can be covered by this panel: methods and models for optimal integration of the multi-energy carriers, first results of Smart City projects in Europe and the integration of virtual power plants. Multi-energy Environomics of Smart Cities Pierluigi Mancarella, University of Manchester, UK

Smart City Projects in Belgium Towards a EU Innovation Center on Intelligent Cities and Buildings Peter Verboven, VITO, Belgium

Virtual Power Plant for Electric and Heat Power in Berlin Hanno Balzer, Vattenfall, Germany

Contribution of Demand Response in a Future Power System Marian Klobasa, Fraunhofer ISI, Germany

Smart City Mannheim – Connection of Intelligent Distribution Network With Intelligent Home Eugen Mayer, Power Plus Communications, Germany

Novel State Estimation for Smart Distribution and Transmission Network Operation

08:30 - 10:15

@ H 1058

PANEL



Chair: Malcolm Irving, Brunel University, UK

Malcolm Irving is Professor of Power Systems in the School of Engineering and Design at Brunel University, Uxbridge, UK. He is also Co-Director of the Brunel Institute of Power Systems, a major research group in the University specializing in algorithms and software for generation, transmission and distribution systems.

Dr. Irving is a longstanding member of IEEE. Prof. Irving is the author or co-author of more than 150 research publications in the fields of power network analysis and optimal power system operation. His special research interests comprise the analysis and control of power systems.

Abstract

A crucial issue for smart grids, especially at distribution level, is the need to monitor the real-time behavior of the power network. This function can be very effectively performed by state estimation algorithms. Although state estimation is already widely adopted at transmission level, the implementation in distribution grids needs to face new issues such as low measurement redundancy, increasing availability of high volumes of smart-meter data and very large scale network models (in terms of the number of nodes and branches). Therefore, this panel will include contributions from industry and from research organizations, which explore some of these issues and their prospective solutions, including the use of parallel processing algorithms on high performance computing platforms. Development of Distribution State Estimation Algorithms and Application Leticia De-Alvaro, EDF, France Sebastien Grenard, EDF, France

Meter Placement Algorithm for Active Distribution Networks Nazia Nusrat, Brunel University, UK Malcolm Irving, Brunel University, UK Gareth Taylor, Brunel University, UK

Performance of Parallel State Estimation on a High Performance Computing Platform David Wallom, University of Oxford, UK

Application of Distribution State Estimation for Asset Management Ivan Lorencin, Korona, Slovenia

Optimal Measurement Placement for State Estimation in Smart Grids Nuno Silva, EFACEC, Portugal

Impact of Distribution State Estimation on Active Operation of Distribution Systems Fabrizio Pilo, University of Cagliari, Italy Giuditta Pisano, University of Cagliari, Italy

Microgrids Operation and Control

08:30 - 10:15

@ H 0107

PAPER PRESENTATION

Chair: Kwang Y. Lee, Baylor University, USA

2012ISGTEU-278

Power Management Strategy for Plug and Play DC Microgrid

Xunwei Yu (North Carolina State University, USA), Alex Q. Huang (North Carolina State University, USA)

2012ISGTEU-218

Optimal Generation Scheduling of a Microgrid

Xiong Wu (Xi'an Jiaotong University, China), Xiuli Wang (Xi'an Jiaotong University, China), Zhaohong Bie (Xi'an Jiaotong University, China)

2012ISGTEU-102

Optimal Storage Capacity Within an Autonomous Micro Grid With a High Penetration of Renewable Energy Sources

Pio Lombardi (Fraunhofer IFF, Germany), Tatiana Sokolnikova (Irkutsk State Technical University, Russia), Konstantin V. Suslov (Irkutsk State Technical University, Russia), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Germany)

2012ISGTEU-115

Optimized Operation, Planning, and Frequency Control of Hybrid Generation-Storage Systems in Isolated Networks

Ehsan Abbasi (TU Berlin, Germany), Hossein Ameli (TU Berlin, Germany), Kai Strunz (TU Berlin, Germany), Duc Nguyen Huu (TU Berlin, Germany)

2012ISGTEU-051

Modeling and Simulation of a Microgrid as a Stochastic Hybrid System Martin Strelec (Honeywell, Czech Republic),

Karel Macek (FNSPE CTU, Czech Republic), Alessandro Abate (TU Delft, Netherlands)

2012ISGTEU-079 The Role of Microgrids in Accelerating Energy Access

Rena Kuwahata (Ecofys, Germany), Nis Martensen (Energynautics, Germany), Thomas Ackermann (Energynautics, Germany), Sven Teske (Greenpeace, Germany)

Research Projects at National and International Level

08:30 - 10:15

@ H 0110

PAPER FORUM

Chair: Carlo A. Nucci, University of Bologna, Italy Co-Chair: Hiroyuki Mori, Meiji University, Japan

2012ISGTEU-284

3eHouses: A Smart Metering Pilot in UK Living Labs

Simon P. Le Blond (Toshiba Research Europe Limited, UK), Alan Holt (IP Performance, UK), Paul White (IP Performance, UK)

2012ISGTEU-020

LV Distribution Network Feeders in Belgium and Power Quality Issues due to Increasing PV Penetration Levels

Carlos Gonzalez (KU Leuven, Belgium), Jurgen Geuns (KU Leuven, Belgium), Sam Weckx (KU Leuven, Belgium), Thomas Wijnhoven (KU Leuven, Belgium), Pieter Vingerhoets (KU Leuven, Belgium), Tom De Rybel (KU Leuven, Belgium), Johan Driesen (KU Leuven, Belgium)

2012ISGTEU-003

Demonstrating Coordinated Voltage Control in a Real Distribution Network

Anna Kulmala (Tampere University of Technology, Finland), Antti Mutanen (Tampere University of Technology, Finland), Antti Koto (Tampere University of Technology, Finland), Sami Repo (Tampere University of Technology, Finland), Pertti Järventausta (Tampere University of Technology, Finland)

2012ISGTEU-209

Impact Investigation of Rooftop Solar PV System: A Case Study in India

Kalpesh A. Joshi (Indian Institute of Technology Gandhinagar, India), Naran M. Pindoriya (Indian Institute of Technology Gandhinagar, India)

2012ISGTEU-063

A Local Energy Management System for Solar Integration and Improved Security of Supply: The Nice Grid Project Andrea Michiorri (MINES ParisTech, France), Robin Girard (MINES ParisTech, France), Georges Kariniotakis (MINES ParisTech, France), Christophe Lebossé (ERDF, France), Sandrine Albou (RTE, France)

2012ISGTEU-056

Electrical Power and Energy Compensation Demand With Regard to Topological Restrictions of the German Mains for an Efficient Operation of a Smart Grid

Daniel Beyer (Fraunhofer AST, Germany), Frank Karstädt (Fraunhofer AST, Germany), Benjamin Fischer (Fraunhofer AST, Germany), Michael Agsten (Fraunhofer AST, Germany), Peter Bretschneider (Fraunhofer AST, Germany)

Research Projects at National and International Level (continued)

08:30 - 10:15

@ H 0110

PAPER FORUM

Chair: Carlo A. Nucci, University of Bologna, Italy Co-Chair: Hiroyuki Mori, Meiji University, Japan

2012ISGTEU-178

Northern Isles New Energy Solutions: Active Network Management Stability Limits

Michael J. Dolan (University of Strathclyde, UK), Graham W. Ault (University of Strathclyde, UK), Damien F. Frame (University of Strathclyde, UK), Simon Gill (University of Strathclyde, UK), Ivana Kockar (University of Strathclyde, UK), Olimpo Anaya-Lara (University of Strathclyde, UK), Stuart Galloway (University of Strathclyde, UK), Bryan O'Neill (Smarter Grid Solutions, UK), Colin Foote (Smarter Grid Solutions, UK), Andrejs Svalovs (Parsons Brinckerhoff, UK)

2012ISGTEU-140

Implementing Active Demand in the ADDRESS Project: Laboratory Tests and First Results From the Field

Regine Belhomme (EDF, France), Philippe Eyrolles (EDF, France), Roberto González Sainz-Maza (Iberdrola, Spain), Joseba Jimeno Huarte (Tecnalia, Spain), Giovanni Valtorta (ENEL, Italy), Elena Morozova (ENEL, Italy), Francesco Naso (ENEL, Italy), Dana Abi Ghanem (University of Manchester, UK), Sarah Mander (University of Manchester, UK)

2012ISGTEU-192

Evaluating Low-carbon Effects of Demand Response From Smart Distribution Grid

Tianrui Zhou (Tsinghua University, China), Chongqing Kang (Tsinghua University, China), Xinyu Chen (Tsinghua University, China), Yue Wu (Jiangxi Electric Power Research Institute, China), Jianbo Xin (Jiangxi Electric Power Research Institute, China)

2012ISGTEU-191

Integration of Surplus Wind Energy by Controlled Charging of Electric Vehicles Stefan Mischinger (TU Berlin, Germany), Wilfried Hennings (Forschungszentrum Jülich, Germany), Kai Strunz (TU Berlin, Germany)

2012ISGTEU-200

Electric Vehicles in Low Voltage Residential Grid: A Danish Case Study

Jayakrishnan R. Pillai (Aalborg University, Denmark), Shaojun Huang (Aalborg University, Denmark), Paul Thøgersen (KK-Electronic, Denmark), Jan Møller (Nyfors, Denmark), Birgitte Bak-Jensen (Aalborg University, Denmark)

2012ISGTEU-176

A Comparison of Electric Vehicle Integration Projects

Peter Bach Andersen (Technical University of Denmark, Denmark), Rodrigo Garcia-Valle (Technical University of Denmark, Denmark), Willett Kempton (University of Delaware, USA)

2012ISGTEU-226

Using Already Existing Artificial Structures for Energy Storage in Areas With High Shares of Renewable Energies Thomas Weiss (Helmut-Schmidt-University, Germany), Detlef Schulz (Helmut-Schmidt-University, Germany)

2012ISGTEU-179

PEGASE Pan-European Test-beds for Testing of Algorithms on Very Large Scale Power Systems

Fortunato Villella (Tractebel Engineering, Belgium), Sylvain Leclerc (RTE, France), István Erlich (University of Duisburg-Essen, Germany), Stephane Rapoport (Tractebel Engineering, Belgium)

Concepts of Smart Grid Security

08:30 - 10:15

@ H 0111

PAPER PRESENTATION

Chair: Federico Silvestro, University of Genova, Italy

2012ISGTEU-016

An Application of Robust Power System Security to Power System Operation for High-penetration of PV

Yoshiharu Okumoto (Chugoku Electric Power Company, Japan), Naoto Yorino (Hiroshima University, Japan), Yoshifumi Zoka (Hiroshima University, Japan), Yutaka Sasaki (Hiroshima University, Japan), Toshihiro Yamanaka (Hiroshima University, Japan), Tomohisa Akiyoshi (Hiroshima University, Japan)

2012ISGTEU-096 Smart Integration of Distribution

Automation Applications

Robert J. W. de Groot (Eindhoven University of Technology, Netherlands), Johan Morren (Eindhoven University of Technology, Netherlands), Han G. Slootweg (Eindhoven University of Technology, Netherlands)

2012ISGTEU-252

Self-healing for Smart Grids: Problem Formulation and Considerations

Youssef Oualmakran (University of Girona, Spain), Joaquim Melendez (University of Girona, Spain), Sergio Herraiz (University of Girona, Spain)

2012ISGTEU-029 Preventive and Emergency Control of Intelligent Power Systems

Nikolay I. Voropai (Melentiev Energy Systems Institute, Russia), Victor G. Kurbatsky (Melentiev Energy Systems Institute, Russia), Nikita V. Tomin (Melentiev Energy Systems Institute, Russia), Daniil A. Panasetsky (Melentiev Energy Systems Institute, Russia)

2012ISGTEU-169

Big Bang-Big Crunch Based Optimal Preventive Control Action on Power Systems

Cavit Fatih Kucuktezcan (Istanbul Technical University, Turkey), Veysel Murat Istemihan Genc (Istanbul Technical University, Turkey)

2012ISGTEU-019

A Smart Power System Restoration Based on the Merger of Two Different Strategies

Jairo Quirós Tortós (University of Manchester, UK) Vladimir Terzija (University of Manchester, UK)

Smart Grid Maintenance and Asset Management

08:30 - 10:15

@ H 0112

PAPER PRESENTATION

Chair: Susanne Landt, TenneT TSO, Germany

2012ISGTEU-154 Applying Reliability Centered Mainte-

nance to a Digital Protective Relay Helder Tavares (University of Porto, Portugal), Helder Leite (U. of Porto, Portugal), Alberto Pinto (EDP, Portugal), Pedro Vidal (EDP, Portugal), José Santos (EDP, Portugal)

2012ISGTEU-175

Reliability Modeling of Protection System Based on Phase-type Distribution Changzhao Wang (South China University of

Technology, China), Yao Zhang (South China University of U. of Technology, China), Gang Wang (South China U. of Technology, China), Longjun Wang (South China U. of Technology, China)

2012ISGTEU-201 Effect of Demand Response on Transformer Lifetime Expectation

Johannes Jargstorf (KU Leuven, Belgium), Koen Vanthournout (VITO, Belgium), Tom De Rybel (KU Leuven, Belgium), Dirk Van Hertem (KU Leuven, Belgium)

2012ISGTEU-106

Implementation of Gaia Methodology for Multi-agent Based Transformer Condition Monitoring

Davoodi Samirmi (University of Liverpool, UK), Wenhu H. Tang (University of Liverpool, UK), Q. Henry Wu (University of Liverpool, UK)

2012ISGTEU-155

A Regulatory Framework for Shortterm Stochastic Maintenance Outage Scheduling in Smart Grids

Mohammad Ali Fotouhi Ghazvini (Polytechnic of Porto, Portugal), Zita Vale (Polytechnic of Porto, Portugal), Hugo Morais (Polytechnic of Porto, Portugal), Bruno Canizes (Polytechnic of Porto, Portugal)

2012ISGTEU-206 Risk-based Life Cycle Cost Analysis

Method for Transmission Systems Weiwei Pan (Zhejiang Electric Power

Corporation, China), Guowei Wu (Zhejiang Electric Power Corporation, China), Hui Zhou (Zhejiang Electric Power Corporation, China), Chong Wang (University of Hong Kong, Hong Kong), Yunhe Hou (University of Hong Kong, Hong Kong)

2012ISGTEU-207

Life Cycle Management Method for Smart Grid Asset With Real Option Theory

Guowei Wu (Zhejiang Electric Power Corporation, China), Hui Zhou (Zhejiang Electric Power Corporation, China), Weiwei Pan (Zhejiang Electric Power Corporation, China), Yunhe Hou (University of Hong Kong, Hong Kong)

Real-time Simulation of Smart Grids

11:00 - 12:45

@ MAIN THEATER

PANEL



Chair: Georg Lauss, Austrian Institute of Technology AIT, Austria

Georg F. Lauss is a researcher at the Austrian Institute of Technology (AIT), Vienna, Austria. He graduated in mechatronics from the Johannes Kepler University of Linz (JKU) in 2006. He has experience as a researcher in the field of power electronics and electric drive control systems. Since 2007 he has been part of the research division of AIT focusing on the field of electric energy systems specialized on inverters for photovoltaics. His main interests cover power electronics, control theory, optimization, power hardware in the loop simulation (PHIL) and mathematical methods for control/simulation.

Abstract

Some of the current challenges in electrical power supply are manifested in the evolution from traditional, centralized grids towards so-called smart grids. Real-time simulation is an essential step to finalize management and control algorithms for smart grids as well as smart grid applications. In this session, various state-ofthe-art problems are being discussed and solution statements are given by means of advanced simulation methods in real time. Key subjects are prototyping and validation of advanced distributed energy resource control, power hardware-in-the-loop methods and simulation, protection and advanced hardware-in-the-loop technology. Real-time Simulation, Prototyping and Validation of Advanced Distributed Energy Resource Control in the G2Elab Raphael Caire, INP Grenoble, France

Laboratory Experiences With Power-hardware-in-the-loop Simulation for Distributed Energy Resources

Panos Kotsampopoulos, National Technical University of Athens, Greece

Real-time Hardware-in-the-loop Validation for Power System Protection and Communication M. Shoaib Almas, KTH Stockholm, Sweden Luigi Vanfretti, KTH Stockholm, Sweden

Approaches to Investigate Complex Grid Scenarios by Means of Novel Power-hardware-in-the-loop Methods Georg Lauss, Austrian Institute of Technology AIT, Austria

Enabling the Next Generation Grid by Means of Advanced Hardware-in-the-loop Technology Antonello Monti, RWTH Aachen, Germany

Market-based Control of Electric Vehicles

11:00 - 12:45

@ H 1058

PAPER PRESENTATION

Chair: Suresh C. Verma, Chubu Electric Power Company, Japan

2012ISGTEU-151

Effects of Plug-in Electric Vehicle Charge Scheduling on the Day-ahead Electricity Market Price

Pavan Balram (Chalmers University of Technology, Sweden), Le Anh Tuan (Chalmers University of Technology, Sweden), Lina Bertling Tjernberg (Chalmers University of Technology, Sweden)

2012ISGTEU-164

Decentralized Participation of Electric Vehicles in Network-constrained Market Operation

Dimitrios Papadaskalopoulos (Imperial College London), Goran Strbac (Imperial College London)

2012ISGTEU-081

Balancing Trade-offs in Coordinated PHEV Charging With Continuous Market-based Control

Klaas De Craemer (KU Leuven, Belgium), Geert Deconinck (KU Leuven, Belgium)

2012ISGTEU-038

Price Incentives for Smart Electric Vehicle Operation – Status Quo and Perspectives

Christine Brandstätt (Bremer Energie Institut, Germany), Nele Friedrichsen (Bremer Energie Institut, Germany)

2012ISGTEU-168

A Distributed Approach to the Integration of Electric Vehicles Into Future Smart Grids

Michael Mierau (Fraunhofer ISE, Germany), Robert Kohrs (Fraunhofer ISE, Germany) Christof Wittwer (Fraunhofer ISE, Germany)

2012ISGTEU-052

A Case Study of Coordinated Electric Vehicle Charging for Peak Shaving on a Low Voltage Grid

Niels Leemput (KU Leuven, Belgium), Frederik Geth (KU Leuven, Belgium), Bert Claessens (VITO, Belgium), Juan Van Roy (KU Leuven, Belgium), Raf Ponnette (VITO, Belgium), Johan Driesen (KU Leuven, Belgium)

Emerging Smart Grid: Improved Distribution Management System incorporating Advanced Solutions

11:00 - 12:45



TUTORIAL



Eric Sortomme, Alstom, USA

Eric Sortomme received the B.S. degree in electrical engineering (magna cum laude) from Brigham Young University, Provo, UT, in 2007 and the Ph.D. degree from the University of Washington, Seattle, in 2011. His past employment experience includes internships with Wavetronix LLC and Puget Sound Energy. He has authored or coauthored a plethora of technical publications. His research interests include smart grid technologies, including microgrids and vehicle-to-grid, and wind power integration. Dr. Sortomme is a corecipient of the 2010 UW Department of Electrical Engineering Chair's Award. He is currently a senior power systems engineer with Alstom Grid working on Distributed Energy Resource Management Systems.

Abstract

This one-half day tutorial will focus on the improvements in Distribution Management Systems incorporating advanced technological solutions for the emerging Smart Grid. The primary objective of this tutorial is to present the state of the art of the emerging smart grid from real-time operations point of view. The course will feature instructors representing the perspectives of the European distribution utility, and the DMS vendor. Topics will include Introduction to the Emerging Distribution Grid, Utility's Perspective for Goals and Requirements of the Smart Distribution Grid, Overview of Distribution Management Functions in the Emerging Smart Paradigm, and Advanced Function Demonstrations. The participants will have an opportunity to engage in an active dialog of challenges and solutions for achieving smart grid goals.

Design of Monitoring and Identification Systems for Smart Grids and Homes

11:00 - 12:45

@ H 0110

PAPER FORUM

Chair: Stephen D. J. McArthur, University of Strathclyde, UK Co-Chair: Prechanon Kumkratug, Kasetsart University, Thailand

2012ISGTEU-181

Noninvasive Monitoring of Residential Loads

Antonio C. S. Lima (Federal University of Rio de Janeiro, Brazil), Alexandre P. Alves da Silva (GE Global Research, Brazil), Diego Nascimento (Federal University of Rio de Janeiro, Brazil)

2012ISGTEU-084

Non-intrusive Appliance Recognition

Gerwin Hoogsteen (University of Twente, Netherlands), Jan Oene Krist (University of Twente, Netherlands), Vincent Bakker (University of Twente, Netherlands), Gerard J.M. Smit (University of Twente, Netherlands)

2012ISGTEU-028

Consumer Phase Identification in a Three Phase Unbalanced LV Distribution Network

Houman Pezeshki (Curtin University, Australia), Peter J. Wolfs (Curtin University, Australia)

2012ISGTEU-018

A Self-Calibrating Partial Discharge WSN for Condition Monitoring in the Future Smart Grid

José M. R. de Souza Neto (Universidade Federal de Campina Grande, Brazil), José S. da Rocha Neto (Universidade Federal de Campina Grande, Brazil), Long Chang (University of Strathclyde, UK), Robert Atkinson (University of Strathclyde, UK), Konstantinos Sasloglou (AGT Group, Germany), Ian A. Glover (University of Strathclyde, UK)

2012ISGTEU-172

A Calibration Method for Power Metering System With Electronic Instrument Transformers

Peng Wang (Tsinghua University, China), Dandan Tan (Beijing Tayuan Power Company, China)

2012ISGTEU-125

Implementation of the IEEE Std 1459-2010 Using Kalman Filter for Fundamental and Harmonics Detection Newton Carlos Will (Federal University of Technology of Paraná, Brazil), Rafael Cardoso (Federal University of Technology of Paraná, Brazil)

2012ISGTEU-040

Parameter Identification of Unknown Radial Grids for Theft Detection

Sam Weckx (KU Leuven, Belgium), Carlos Gonzalez (KU Leuven, Belgium), Jeroen Tant (KU Leuven, Belgium), Tom De Rybel (KU Leuven, Belgium), Johan Driesen (KU Leuven, Belgium)

2012ISGTEU-024

Optimized Positioning of Measurements in Distribution Grids

David Echternacht (RWTH Aachen, Germany), Christian Linnemann (RWTH Aachen, Germany), Albert Moser (RWTH Aachen, Germany.)

2012ISGTEU-101

Measurement Infrastructure for Observing and Controlling Smart Electrical Grids

Gert Rietveld (Van Swinden Laboratorium, Netherlands), Paul Clarkson (National Physical Laboratory, UK), Paul S. Wright (National Physical Laboratory, UK), U. Pogliano (Instituto Nationale di Ricerca Metrologica, Italy), Jean-Pierre Braun (METAS, Switzerland), Miha Kokalj (Slovenian Institute of Quality and Metrology, Slovenia), Rado Lapuh (Slovenian Institute of Quality and Metrology, Slovenia), Norbert Zisky (Physikalisch-Technische Bundesanstalt, Germany)

2012ISGTEU-259

Sensing in Power Distribution Networks via Large Numbers of Smart Meters

Dejan Ilic (SAP, Germany.), Stamatis Karnouskos (SAP, Germany.), Per Goncalves Da Silva (SAP, Germany.)

2012ISGTEU-234

State Identification and Automatic Control of Smart Low Voltage Grids

Nils Neusel-Lange (University of Wuppertal, Germany), Christian Oerter (University of Wuppertal, Germany), Markus Zdrallek (University of Wuppertal, Germany)

2012ISGTEU-067

Probabilistic Approach-based PMU Placement for Real-time Power System Vulnerability Assessment

Jaime C. Cepeda (National University of San Juan, Argentina), José L. Rueda (University of Duisburg-Essen, Germany), István Erlich (University of Duisburg-Essen, Germany), Delia G. Colomé (National University of San Juan, Argentina)

2012ISGTEU-082

New Information Technologies for State Estimation of Power Systems With FACTS

Piotr I. Bartolomey (Ural Federal University, Russia), Stanislav A. Eroshenko (Ural Federal University, Russia), Egor M. Lebedev (System Operator of the United Power System, Russia), Anton A. Suvorov (Ural Federal University, Russia)

2012ISGTEU-173

Family of Energy Management System for Smart Grid

Hongbin Sun (Tsinghua University, China), Boming Zhang (Tsinghua University, China), Wenchuan Wu (Tsinghua University, China), Qinglai Guo (Tsinghua University, China)

Voltage Control

11:00 - 12:45

@ H 0111

PAPER PRESENTATION

Chair: Andreas Lugmaier, Siemens, Austria

2012ISGTEU-062

Distribution Network Voltage Control Using Energy Storage and Demand Side Response

Jialiang Yi (Durham University, UK), Pengfei Wang (Durham University, UK), Phillip C. Taylor (Durham University, UK), Peter J. Davison (Durham University, UK), Pádraig F. Lyons (Durham University, UK), Daniel Liang (Durham University, UK), Stuart Brown (Northern Powergrid, UK), David Roberts (EA Technology, UK)

2012ISGTEU-136

Optimization of the Steady Voltage Profile in Distribution Systems by Coordinating the Controls of Distributed Generations

Yujun He (Supélec, France), Marc Petit (Supélec, France), Philippe Dessante (Supélec, France)

2012ISGTEU-167

Consumer Voltage Regulation Using Coordinated Control of Distributed Static Synchronous Compensators – µSTATCOMs

Yuichiro Kabasawa (Central Research Institute of Electric Power Industry, Japan), Taku Noda (Central Research Institute of Electric Power Industry, Japan), Kentaro Fukushima (Central Research Institute of Electric Power Industry, Japan) Koshichi Nemoto (Central Research Institute of Electric Power Industry, Japan)

2012ISGTEU-223

Centralized Voltage Control Method Using Plural D-STATCOM With Controllable Dead Band in Distribution System With Renewable Energy Naoyuki Takahashi (Waseda University, Japan), Yasuhiro Hayashi (Waseda University, Japan)

2012ISGTEU-224

Centralized Voltage Control Method of Load Ratio Control Transformer and Step Voltage Regulator for Bank Fault Restoration

Shinya Yoshizawa (Waseda University, Japan), Yasuhiro Hayashi (Waseda University, Japan), Masaki Tsuji (Tokyo Electric Power Company, Japan), Eiji Kamiya (Tokyo Electric Power Company Japan)

2012ISGTEU-229

Regulated Distribution Transformers in Low-voltage Networks With a High Degree of Distributed Generation

Peter Esslinger (TU München, Germany), Rolf Witzmann (TU München, Germany)

Large-scale Impact of Demand Side Management

11:00 - 12:45

@ H 0112

PAPER PRESENTATION

Chair: Jochen Schäfer, Siemens, Germany

2012ISGTEU-133

Optimizing the Use of Flexible Residential Demand for Balancing Wind Power Muhajir Tadesse Mekonnen (KU Leuven, Belgium), Benjamin Dupont (KU Leuven, Belgium), Kristof De Vos (KU Leuven, Belgium), Kris Kessels (VITO, Belgium), Ronnie Belmans (KU Leuven, Belgium)

2012ISGTEU-050

Security-constrained Dispatch With Controllable Loads for Integrating Stochastic Wind Energy Simon Kwok Kei Ng (University of Hong Kong, Hong Kong), Jin Zhong (University of Hong Kong, Hong Kong)

2012ISGTEU-174

Flexible Consumers Reserving Electricity and Offering Profitable Downward Regulation

Nicolas Höning (CWI Amsterdam, Netherlands), Han La Poutré (CWI Amsterdam, Netherlands)

2012ISGTEU-279

Reliability Performance of Smart Grids With Demand-side Management and Distributed Generation/Storage Technologies

Ignacio Hernando-Gil (University of Edinburgh, UK), Irinel-Sorin Ilie (University of Edinburgh, UK), Saša Z. Djokić (University of Edinburgh, UK)

2012ISGTEU-260

A Survey Towards Understanding Residential Prosumers in Smart Grid Neighbourhoods

Per Goncalves Da Silva (SAP, Germany), Stamatis Karnouskos (SAP, Germany), Dejan Ilic (SAP, Germany)

2012ISGTEU-150 Involvement of Flexible Loads in

Transmission System Operation

Steffen Schlegel (TU Ilmenau, Germany), Robert Schwerdfeger (TU Ilmenau, Germany), Dirk Westermann (TU Ilmenau, Germany)

Hydroelectric Power Generation From Scandinavia in the Future European Smart Grid

14:00 - 15:30

@ MAIN THEATER

PANEL



Chair: Lina Bertling Tjernberg, Chalmers University, Sweden

Lina Bertling Tjernberg holds the Chair of Professor in Sustainable Electric Power Systems at Chalmers University of Technology, in Gothenburg, Sweden, since 2009. During 2007-2009 she has been with Svenska Kraftnät. She has been with the Royal Institute of Technology (KTH) during 1997 to 2009, where she became Associate Professor in 2008, and finalized her Ph.D. in 2002.

Dr. Bertling is serving as IEEE PES Treasurer. She is the Chair of the Swedish PE/PEL Chapter and the IEEE PES Subcommittee on Risk, Reliability and Probability Applications (RRPA). She is a member of the Editorial board of the IEEE Transactions of Smart Grid. She was General Chair of the first IEEE PES ISGT Europe Conference, in Gothenburg, 2010. She is a member of the Swedish National Committee of Ciréd and the World Energy Council, and a member of Cigré. She is a Member of the Government Coordination Council for smart grid.

Abstract

Hydroelectric power generation is substantial for the developments of the future energy system in Europe since it offers a renewable and controllable energy source as well as storage potentials. The ongoing development to meet climate and energy goals has so far resulted in a major change with increased intermittent power generation. This leads to increased need for balancing resources and transmission capacity, where the delivery of hydroelectric power generation from Scandinavia will play a key role. Therefore, this panel focusses on Scandinavian experts and their visions for the electric power system, possibilities for capacity delivery to northern Europe, development perspectives and required economic incentives.

The Scandinavian Electric Power System With New Possibilities for Capacity Delivery to Northern Europe Sture Larsson, Svenska Kraftnät, Sweden

Developments of the Hydroelectric Power Generation in Norway

Gerard Doorman, Norwegian University of Science and Technology Trondheim, Norway

Technology Developments Using HVDC Grids for Power Delivery

Xiao-Ping Zhang, University of Birmingham, UK

Economical Incentives to Handle the Large Increase of Renewables in the European Energy System

Tomas Tangerås, Research Institute of Industrial Economics Stockholm, Sweden

Tariffs and Customer Relations

14:00 - 15:30

@ H 1058

PAPER PRESENTATION

Chair: Heiko Lehmann, Deutsche Telekom, Gerrmany

2012ISGTEU-143

The Market Approach of Demand Management in the Power System Vladimir S. Stepanov (Irkutsk State Technical University, Russia), Konstantin V. Suslov (Irkutsk State Technical University, Russia), Leonid M. Chebotnyagin (Irkutsk State Technical University, Russia), Natalia S. Moskalenko (Otto-von-Guericke University Magdeburg, Germany), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Germany)

2012ISGTEU-202

Automated Residential Demand Response Based on Dynamic Pricing Benjamin Dupont (KU Leuven, Belgium), Jeroen Tant (KU Leuven, Belgium), Ronnie Belmans (KU Leuven, Belgium)

2012ISGTEU-034

Influencing Domestic Customers' Market Behavior With Time Flexible Tariffs

Mike Ifland (TU Ilmenau, Germany), Nadine Exner (TU Ilmenau, Germany), Dirk Westermann (TU Ilmenau, Germany)

2012ISGTEU-241 Setting Regulatory Incentives for Continuity of Supply in Smart Distribution Grids Rafael Cossent (Comillas Pontifical University, Spain)

2012ISGTEU-048

Assessment Method for Incentives and Their Optimization Considering Demand Response of Consumers Thomas Holtschneider (University of Duisburg-Essen, Germany), István Erlich (University of Duisburg-Essen, Germany)

2012ISGTEU-060

A New Customer Relation Model for Energy Utilities

Massimiliano Schillaci (MGTECH, Italy), Paola Bisaglia (DORA – STMicroelectronics Group, Italy), Andrea Giorgi (STMicroelectronics, Italy)

Energy Management of Systems With Battery Storage

14:00 – 15:30

@ H 0107

PAPER PRESENTATION

Chair: Pieter Vingerhoets, KU Leuven, Belgium

2012ISGTEU-045

Robust Control Design for Integration of Energy Storage Into Frequency Regulation

Dinghuan Zhu (Carnegie Mellon University, USA), Gabriela Hug-Glanzmann (Carnegie Mellon University, USA)

2012ISGTEU-160

Energy Management System With Dynamic Component Control for Efficiency Optimization

Natalia Moskalenko (Otto-von-Guericke University Magdeburg, Germany), Christoph Wenge (Fraunhofer IFF, Germany), Alexander Pelzer (Fraunhofer IFF, Germany), Przemyslaw Komarnicki (Fraunhofer IFF, Germany), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Germany)

2012ISGTEU-282

Load Frequency Control Using Distributed Batteries on the Demand Side With Communication Characteristics Kohei Wada (University of Tokyo, Japan), Akihiko Yokoyama (University of Tokyo, Japan)

2012ISGTEU-146

Operation Strategies of Hybrid Energy Storages in Low-voltage Distribution Grids With a High Degree of Decentralized Generation

Martin Lödl (TU München, Germany), Rolf Witzmann (TU München, Germany)

2012ISGTEU-141

Technical and Economic Assessment for Optimal Sizing of Distributed Storage Ismael Miranda (University of Porto, Portugal), Nuno Silva (EFACEC, Portugal), Helder Leite (University of Porto, Portugal)

2012ISGTEU-159

Physical-hybrid Simulation for In-situ Evaluation of Energy Storage System Nicholas Etherden (Luleå University of Technology, Sweden), Leopold Weingarten (STRI, Sweden), Math Bollen (Luleå University of Technology, Sweden)

Real-time Modeling and Laboratories of Smart Grids

14:00 - 15:30

@ H 0110

PAPER FORUM

Chair: Osama Mohammed, Florida International University, USA Co-Chair: Olivier Beaude, Renault, France

2012ISGTEU-198

Electrical Design of an Efficiency House Plus

Jörg Dickert (TU Dresden, Germany), Tobias Heß (TU Dresden, Germany), Peter Schegner (TU Dresden, Germany), Clemens Felsmann (TU Dresden, Germany)

2012ISGTEU-054

An Experimental Study on Load-peak Shaving in Smart Homes by Means of Online Admission Control

Giuseppe Tommaso Costanzo (Technical University of Denmark, Denmark), Anna Magdalena Kosek (Technical University of Denmark, Denmark), Guchuan Zhu (Ecole Polytechnique de Montreal, Canada), Luca Ferrarini (Politecnico di Milano, Italy), Miguel F. Anjos (Ecole Polytechnique de Montreal, Canada), Gilles Savard (Ecole Polytechnique de Montreal, Canada)

2012ISGTEU-187

Real Time Validation of an Optimization Building Energy Management Strategy Based on Power-hardware-in-the-loop Tool

Rim Missaoui (INP Grenoble, France), Ghaith Warkozek (INP Grenoble, France), Seddik Bacha (INP Grenoble, France), Stéphane Ploix (INP Grenoble, France)

2012ISGTEU-197

A Microgrid Structure Supplying a Research and Education Centre – Polish Case

Jacek Wasilewski (Warsaw University of Technology, Poland), Mirosław Parol (Warsaw University of Technology, Poland), Tomasz Wójtowicz (Warsaw University of Technology, Poland), Zbigniew Nahorski (Systems Research Institute of the Polish Academy of Science, Poland)

2012ISGTEU-036 Modeling and Validation of a Flywheel Energy Storage Lab-setup

Francisco Diaz-González (IREC, Spain), Andreas Sumper (IREC, Spain), Oriol Gomis-Bellmunt (IREC, Spain), Roberto Villafafila-Robles (Universitat Politecnica de Catalunya, Spain)

2012ISGTEU-135 Modeling and Investigation of Communication and Protection Scenarios for Smart Grid

Illia Bielchev (Otto-von-Guericke University Magdeburg, Ger.), André Naumann (Ottovon-Guericke University Magdeburg, Ger.), Alexander Visyashchev (Irkutsk State Technical University, Russia), Rainer Krebs (Siemens, Ger.), Zbigniew A. Styczynski (Otto-von-Guericke University Magdeburg, Ger.)

2012ISGTEU-232

A Virtual Laboratory for Microgrid Information and Communication Infrastructures

James Weimer (KTH Stockholm, Sweden), Yuzhe Xu (KTH Stockholm, Sweden), Carlo Fischione (KTH Stockholm, Sweden), Karl Henrik Johansson (KTH Stockholm, Sweden), Per Ljungberg (Ericsson, Sweden), Craig Donovan (Ericsson, Sweden), Ariane Sutor (Siemens, Germany), Lennart E. Fahlén (Swedish Institute of Computer Science, Sweden)

2012ISGTEU-007

A Generic Danish Distribution Grid Model for Smart Grid Technology Testing

Seung Tae Cha (Technical University of Denmark, Denmark), Qiuwei Wu (Technical University of Denmark, Denmark), Jacob Østergaard (Technical University of Denmark, Denmark)

2012ISGTEU-098

Analysis of the Italian Distribution System Evolution Through Reference Networks

Antonio Bracale (University of Napoli Parthenope, Italy), Roberto Caldon (University of Padova, Italy), Gianni Celli (University of Cagliari, Italy), Massimiliano Coppo (University of Padova, Italy), Diego Dal Canto (ENEL, Italy), Roberto Langella (University of Naples Federico II, Italy), Giacomo Petretto (ENEL, Italy), Fabrizio Pilo (University of Cagliari, Italy), Giuditta Pisano (University of Cagliari, Italy), Daniela Proto (University of Naples Federico II, Italy), Sandra Scalari (ENEL, Italy), Roberto Turri (University of Padova, Italy)

2012ISGTEU-196

Model of a Real Medium Voltage Distribution Network for Analysis of Distributed Generation Penetration in a Smart Grid Scenario

Francesco Adinolfi (University of Genova, Italy), Francesco Baccino (University of Genova, Italy), Mattia Marinelli (University of Genova, Italy), Stefano Massucco (University of Genova, Italy), Federico Silvestro (University of Genova, Italy)

2012ISGTEU-021

Comparison of Line Voltage Stability Indices Using Dynamic Real Time Simulation

Marco Cupelli (RWTH Aachen, Germany), Christine Doig Cardet (RWTH Aachen, Germany), Antonello Monti (RWTH Aachen, Germany)

2012ISGTEU-231

Investigation of the Adaptability of Transient Stability Assessment Methods to Real-time Operation

Tilman Weckesser (Technical University of Denmark, Denmark), Hjörtur Jóhannsson (Technical University of Denmark, Denmark), Stefan Sommer (Technical University of Denmark, Denmark), Jacob Østergaard (Technical University of Denmark, Denmark)

2012ISGTEU-244

Real-time Implementation of an Automatic Voltage Stabilizer for HVDC Control

Kim Weyrich (FH Frankfurt University of Applied Sciences, Germany), Rujiroj Leelaruji (KTH Stockholm, Sweden), Walter Kuehn (FH Frankfurt University of Applied Sciences, Germany), Luigi Vanfretti (KTH Stockholm, Sweden)

Methods of Modeling Uncertainty and Reliability

14:00 - 15:30

@ H 0111

PAPER PRESENTATION

Chair: Hongbin Sun, Tsinghua University, China

2012ISGTEU-073

Electricity Price Forecasting Considering Residual Demand

Amir Motamedi (AESO, Canada), Christian Geidel (TU Berlin, Germany), Hamidreza Zareipour (University of Calgary, Canada), William D. Rosehart (University of Calgary, Canada)

2012ISGTEU-170

Methods for Energy Price Prediction in the Smart Grid

Emanuele Crisostomi (University of Pisa, Italy), Mauro Tucci (University of Pisa, Italy), Marco Raugi (University of Pisa, Italy)

2012ISGTEU-041

Simulating the Optimized Participation of Distributed Controllable Generators at the Spot Market for Electricity Considering Prediction Errors

Raphael Hollinger (Fraunhofer ISE, Germany), Simon Hamperl (Fraunhofer ISE, Germany), Thomas Erge (Fraunhofer ISE, Germany), Bernhard Wille-Hausmann (Fraunhofer ISE, Germany), Christof Wittwer (Fraunhofer ISE, Germany)

2012ISGTEU-068 Identification of Gaussian Mixture Model Using Mean Variance Mapping Optimization: Venezuelan Case

Fancisco M. Gonzalez-Longatt (Coventry University, UK), Jose L. Rueda (University of Duisburg-Essen, Germany), István Erlich (University of Duisburg-Essen, Germany), Dimitar Bogdanov (Technical University of Sofia, Bulgaria), Walter Villa (National University of San Juan, Argentina)

2012ISGTEU-171

Intelligent State Space Pruning With Local Search for Power System Reliability Evaluation

Robert C. Green II (University of Toledo, USA), Lingfeng Wang (University of Toledo, USA), Mansoor Alam (University of Toledo, USA)

2012ISGTEU-213

Statistical Analysis of Power Quality Disturbances Propagation by Means of the Method of Disturbances Interaction Andrés Pavas (Universidad Nacional de Colombia, Colombia), Horacio Torres-Sánchez (Universidad Nacional de Colombia, Colombia), Volker Staudt (Ruhr Universitaet Bochum, Germany)

Methods for Integration of Photovoltaics

14:00 - 15:30

@ H 0112

PAPER PRESENTATION

Chair: Debora Coll-Mayor, SMA, Germany

2012ISGTEU-109 Impact of High-penetration PV on Distribution Feeders

Rossen Tzartzev (University of Texas at Austin, USA), W. Mack Grady (University of Texas at Austin, USA), Jay Patel (Kansas City Power & Light, USA)

2012ISGTEU-185

Evaluating Improved Generation Efficiency: One Year Using Residential PV Voltage Control With a Clustered Residential Grid-interconnected PV Yusuke Miyamoto (Kandenko, Japan), Yasuhiro Hayashi (Waseda University, Japan)

2012ISGTEU-188 Modeling Photovoltaic Optimized Charging of Electric Vehicles

Lena-Marie Ritte (ILF Consulting Engineers, Germany), Stefan Mischinger (TU Berlin, Germany), Kai Strunz (TU Berlin, Germany), Johannes Eckstein (E.ON, Germany) Wednesday

Energy Storage Options for Voltage Support in Low-voltage Grids With High Penetration of Photovoltaic Francesco Marra (SMA, Germany), Y. Tarek Fawzy (SMA, Germany), Thorsten Bülo

Fawzy (SMA, Germany), Thorsten Bülo (SMA, Germany), Boštjan Blažic (University of Ljubljana, Slovenia)

2012ISGTEU-288 A Maximum Power Point Tracker

2012ISGTEU-264

2012ISGTEU-086

Distribution Networks

Using Photovoltaic Systems to

Improve Voltage Control in Low Voltage

Justino Rodrigues (INESC Porto, Portugal),

Fernanda Resende (INESC Porto, Portugal)

Variable–DC–link Three–phase Inverter for Grid–connected PV Panels

Fernando Mancilla–David (University of Colorado Denver, USA), Arnaldo Arancibia (TU Berlin, Germany), F. Riganti–Fulginei (University of Roma Tre, Italy), Edward Muljadi (NREL, USA), Matteo Cerroni (University of Roma Tre, Italy)

Pathways to a European Smart Grid

16:00 - 17:30

@ MAIN THEATER

PANEL



Chair: Gérald Sanchis, RTE, France

Gérald Sanchis is responsible of Research & Development in the European Department of RTE, the French TSO. He received his Dipl.-Ing. degree in electrical engineering from the Polytechnic Institute of Toulouse, France. He is the overall coordinator of the FP7 European Project e-Highway2050, a study program towards a modular development plan on the pan-European Electricity Highways System. Mr. Sanchis held a variety of positions in management and in technical domains inside RTE. From 2007 to 2011, he was appointed as special adviser in asset management for the German Company EnBW TNG.

Mr. Sanchis is distinguished member of Cigre for his whole contributions since 1992. He is a fellow of ENTSO-E, the European Association of Transmission System Operators with involvement in different working groups dealing with network development planning, asset management and R&D.

Abstract

To overcome Europe's strong dependence on conventional energy resources, the renewable energy sources in each region and country must be exploited to a greater extend. The resulting risk of overproduction or shortage of energy can be significantly reduced if a European smart grid on the transmission level is realized. This smart grid enables effective transport of energy from generation to regions with high loads or high storage potential. On the distribution level, corresponding measurers support overall efficiency. In the panel, experts from European Commission, industry and science will discuss which steps need to be taken in order to realize the vision of such a grid for Europe. e-HIGHWAY 2050 – The ENTSO-E Facilitated Study Program Towards a Modular Development Plan on a Pan-European Electricity Highways System 2050 Kai Adam, Swissgrid, Switzerland Matthias Müller-Mienack, 50Hertz, Germany Mihai Paun, ENTSO-E, Belgium Gérald Sanchis, RTE, France Kai Strunz, TU Berlin, Germany

Requirements for a Smart Grid From the Perspective of a TSO Flavia Lenk, 50Hertz, Germany

Developing and Deploying Smart Grids in Europe Patrick Van Hove, European Commission, Belgium

Co-operative Realization of the European Smart Grid

Nikos Hatziargyriou, National Technical University of Athens, Greece João A. Peças Lopes, INESC Porto, Portugal Kai Strunz, TU Berlin, Germany

Ten Steps to the Smart Grid

Gunnar Lorenz, Eurelectric, Belgium Sophie Tielemans, Eurelectric, Belgium

Energy Management in Smart Homes

16:00 - 17:30

@ H 1058

PAPER PRESENTATION

Chair: Matthias D. Galus, Swiss Federal Office of Energy, Switzerland

2012ISGTEU-092

Integrated Energy Optimization With Smart Home Energy Management Systems

Ballard Asare-Bediako (Eindhoven University of Technology, Netherlands) Paulo F. Ribeiro (Eindhoven University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands)

2012ISGTEU-216

Distributed Energy Resources for a Zero-energy Neighborhood

Rosa Morales González (Eindhoven University of Technology, Netherlands), Ballard Asare-Bediako (Eindhoven University of Technology, Netherlands), Sjef Cobben (Eindhoven University of Technology, Netherlands), Wil L. Kling (Eindhoven University of Technology, Netherlands), Gerrit Scharrenberg (NV RENDO, Netherlands), Dirk Dijkstra (NV RENDO, Netherlands)

2012ISGTEU-236

Energy Management Problem in Dwellings: Combining Centralized and Distributed Solving Approaches

Hussein Joumaa (INP Grenoble, France), Gregory De-Oliviera (INP Grenoble, France), Stephane Ploix (INP Grenoble, France), Mireille Jacomino (INP Grenoble, France)

2012ISGTEU-006

Platform for Coordination of Energy Generation and Consumption in Residential Neighborhoods

Vladimír Bicik (Czech Technical University, Czech Republic), Ondrej Holub (Honeywell, Czech Republic), Karel Marik (Honeywell, Czech Republic), Marek Sikora (Honeywell, Czech Republic), Petr Stluka (Honeywell, Czech Republic), Reinhilde D'hulst (VITO, Belgium)

2012ISGTEU-058 Load Models for Home Energy System and Micro Grid Simulations

Christoph Molitor (RWTH Aachen, Germany), Kanali Togawa (RWTH Aachen, Germany), Sebastian Bolte (RWTH Aachen, Germany), Antonello Monti (RWTH Aachen, Germany)

Management of Electric Vehicles

2012ISGTEU-032

Battery Wear

(Konkuk University, Korea)

Economics of V2G Frequency

Regulation in Consideration of the

Sekyung Han (AIST, Japan), Soohee Han

16:00 - 17:30

@ H 0107

PAPER PRESENTATION

Chair: Janusz Bialek, University of Durham, UK

2012ISGTEU-195 Requirements for EV Charge Stations With Photovoltaic Generation and Storage

Ignasi Cairo (IREC, Spain), Andreas Sumper (IREC, Spain)

2012ISGTEU-083

Case Study of the Load Demand of Electric Vehicle Charging and Optimal Charging Schemes in an Urban Area

Ville Tikka (Lappeenranta University of Technology, Finland), Jukka Lassila (Lappeenranta University of Technology, Finland), Henri Makkonen (Lappeenranta University of Technology, Finland), Jarmo Partanen (Lappeenranta University of Technology, Finland)

2012ISGTEU-120

Forecasting Issues for Managing a Portfolio of Electric Vehicles Under a Smart Grid Paradigm Ricardo J. Bessa (INESC Porto, Portugal), Manuel A. Matos (INESC Porto, Portugal)

2012ISGTEU-249

Coordination Strategies for Distribution Grid Congestion Management in a Multi-actor, Multi-objective Setting Peter Bach Andersen (Technical University of Denmark, Denmark)

Energy Management of Systems With Heat Pumps and Thermal Storage

16:00 - 17:30

@ H 0110

PAPER FORUM

Chair: William D. Rosehart, University of Calgary, Canada Co-Chair: Nabeel Tawalbeh, University of Jordan, Jordan

2012ISGTEU-261

Design of Demand Management System for Household Heating and Cooling Suyang Zhou (University of Birmingham, UK), Xiao-Ping Zhang (University of Birmingham, UK), Xuan Yang (University of Birmingham, UK)

2012ISGTEU-030

An ARTMAP-incorporated Multi-agent System for Building Intelligent Heat Management

Maizura Mokhtar (University of Central Lancashire, UK), Xiongwei Liu (University of Central Lancashire, UK)

2012ISGTEU-078

Fine-time-granularity Fast Demand Control of Building HVAC Facilities for Future Smart Grid

Chuzo Ninagawa (Gifu University, Japan), Seiji Kondo (Mitsubishi Heavy Industries, Japan), Shinichi Isozumi (Mitsubishi Heavy Industries, Japan), Hiroki Yoshida (Gifu University, Japan)

2012ISGTEU-077 Demand Side Management of Electric Boilers

Elke Klaassen (Eindhoven University of Technology, Netherlands), Yan Zhang (ABB, Switzerland), Ioannis Lampropoulos (Eindhoven University of Technology, Netherlands), Han Slootweg (Eindhoven University of Technology, Netherlands)

2012ISGTEU-238

Shifting of Thermal and Schedulable Loads Based on Abstract Cost Profiles Markus Damm (Vienna University of Technology, Austria), Milan Lukic (University of Novi Sad, Serbia), Stefan Mahlknecht (Vienna University of Technology, Austria), Jan Haase (Vienna University of Technology, Austria), Christoph Grimm (Vienna University of Technology, Austria), Veljko Malbasa (University of Novi Sad, Serbia)

2012ISGTEU-039

Aggregating the Flexibility Provided by Domestic Hot-water Boilers to Offer Tertiary Regulation Power in Switzerland

Olle Sundström (IBM, Switzerland), Carl Binding (IBM, Switzerland), Dieter Gantenbein (IBM, Switzerland), Daniel Berner (BKW FMB Energy, Switzerland), Wolf-Christian Rumsch (BKW FMB Energy, Switzerland)

2012ISGTEU-001

Integration of Heat Pumps in Distribution Grids: Economic Motivation for Grid Control

Stefan Nykamp (University Twente, Netherlands), Albert Molderink (University Twente, Netherlands), Vincent Bakker (University Twente, Netherlands), Hermen A. Toersche (University Twente, Netherlands), Johann L. Hurink (University Twente, Netherlands), Gerard J. M. Smit (University Twente, Netherlands)

2012ISGTEU-272

Electricity Demand Impact From Increased Use of Ground Sourced Heat Pumps

Javier Campillo (Mälardalen University, Sweden), Fredrik Wallin (Mälardalen University, Sweden), Iana Vassileva (Mälardalen University, Sweden), Erik Dahlquist (Mälardalen University, Sweden)

2012ISGTEU-065

Modeling a Vendor Independent IEC 61850 Profile for Energy Management of Micro-CHP Units

Stefan Feuerhahn (Fraunhofer ISE, Germany), Raphael Hollinger (Fraunhofer ISE, G.), Chau Do (Fraunhofer ISE, G.), Bernhard Wille-Haussmann (Fraunhofer ISE, G.), Christof Wittwer (Fraunhofer ISE, G.)

2012ISGTEU-163

Combined Heat and Power and Consumption Optimization in a SCADAbased System

Filipe Fernandes (Polytechnic of Porto, Portugal), Hugo Morais (P. of Porto, Portugal), Pedro Faria (P. of Porto, Portugal), Zita Vale (P. of Porto, Portugal), Carlos Ramos (P. of Porto, Portugal)

2012ISGTEU-193

Development of a Control Strategy for Mini CHP Plants for an Active Voltage Management in Low Voltage Networks Diego I. Hidalgo Rodriguez (Fraunhofer IWES, Germany), Lukas Spitalny (TU Dortmund, Germay), Johanna Myrzik (TU Dortmund, Germay), Martin Braun (University of Stuttgart, Germay)

2012ISGTEU-189 Method of Controlling Reverse Power Flow of PV System With Heat Pump

Water Heater Masahiro Asari (Central Research Institute of Electric Power Industry, Japan), Hiromu Kobayashi (Central Research Institute of Electric Power Industry, Japan)

2012ISGTEU-270

Demand Side Management Through Heat Pumps, Thermal Storage and Battery Storage to Increase Local Self-consumption and Grid Compatibility of PV Systems

Christopher J. C. Williams (ZSW, Germany), Jann O. Binder (ZSW, Germany), Tobias Kelm (ZSW, Germany)

2012ISGTEU-280

Thermal Comfort Analysis During Power Fluctuation Compensation by Use of Air-conditioning System

Shunsuke Kawachi (University of Tokyo, Japan), Hiroto Hagiwara (University of Tokyo, Japan), Jumpei Baba (University of Tokyo, Japan), Eisuke Shimoda (Shimizu Corporation, Japan)

Modeling of Load and Battery Resources

16:00 - 17:30

@ H 0111

PAPER PRESENTATION

Chair: Parimal Acharjee, NIT Durgapur, India

2012ISGTEU-064

An Improved Lithium-ion Battery Model With Temperature Prediction Considering Entropy

Xue Feng (Nanyang Technological University, Singapore), Hoav B. Gooi (Nanyang Technological University, Singapore), Shuai X. Chen (Nanyang Technological University, Singapore)

2012ISGTEU-251

A Dynamic Battery Model for Simulation of Battery-to-grid Applications

Clemens Guenther (ZSW, Germany), Joaquin Klee Barillas (ZSW, Germany), Stefan Stumpp (ZSW, Germany), Michael A. Danzer (ZSW, Germany)

2012ISGTEU-137

Processing of Load Parameters Based on Existing Load Models

Lidija M. Korunovic (University of Niš, Serbia), Stefan Sterpu (EDF, France), Saša Z. Djokić (University of Edinburgh, UK), Koji Yamashita (Central Research Institute of Electric Power Industry, Japan), Sergio Martinez Villanueva (Red Eléctrica de España, Spain) Jovica V. Milanovic (University of Manchester, UK)

2012ISGTEU-262 Multi-scale Electrical Load Modelling for Demand-side Management

Adam J. Collin (University of Edinburgh, UK), George Tsagarakis (University of Edinburgh, UK), Aristides E. Kiprakis (University of Edinburgh, UK), Stephen McLaughlin (Heriot-Watt University, UK)

2012ISGTEU-182 Passivity-based Control of Synchronous Motors

Hua Xue (Shanghai University of Electric Power, China), Yufei Wang (Shanghai University of Electric Power, China)

Optimal Power Flow Control via Dispatching, **Demand Response, and Reconfiguration**

16:00 - 17:30

@ H 0112

PAPER PRESENTATION

Chair: Dirk Westermann, TU Ilmenau, Germany

2012ISGTEU-132

Area-level Reduction of Wheeling Loop Flows in Regional Power Networks

Sanja Cvijic (Carnegie Mellon University, USA), Marija Ilic (Carnegie Mellon University, USA)

2012ISGTEU-203

The Autonomic Power System - Network Operation and Control Beyond Smart Grids

Stephen D. J. McArthur (University of Strathclyde, UK), Philip C. Taylor (Durham University, UK), Graham W. Ault (University of Strathclyde, UK), James E. King (Parsons Brinckerhoff, UK), Dimitrios Athanasiadis (University of Strathclyde, UK), Varvara D. Alimisis (Durham University, UK), Maciej Czaplewski (University of Strathclyde, UK)

2012ISGTEU-127

Distributed Generation Management: An Optimal Sensitivity Approach for **Decentralized Power Control**

Vito Calderaro (University of Salerno, Italy), Vincenzo Galdi (University of Salemo, Italy), Giovanni Massa (University of Salerno, Italy), Antonio Piccolo (University of Salerno, Italy)

2012ISGTEU-269

2012ISGTEU-011

Belaium)

Integration of Optimal Reconfiguration **Tools in Advanced Distribution** Management System

Smart Grid Reconfiguration Using

Sergio Bruno (Polytechnic School of Bari, Italy), Silvia Lamonaca (Polytechnic School of Bari, Italy), Massimo La Scala (Polytechnic School of Bari, Italy), Ugo Stecchi (Polytechnic School of Bari, Italy)

Conference Closing

17:30 - 18:00

@ MAIN THEATER

PLENARY



Closing Notes Chair: Kai Strunz, TU Berlin, Germany

Kai Strunz has been Professor and Chair of Sustainable Electric Networks and Sources of Energy (SENSE) at TU Berlin since 2007. He obtained the Dr.-Ing. degree with summa cum laude from Saarland University in 2001. From 1995 to 2007, he was research assistant at Brunel University in London, research engineer at Electricité de France (EDF) and Assistant Professor at the University of Washington in Seattle. Dr. Strunz received the National Science Foundation (NSF) CAREER award in 2003.

Dr. Strunz is Chair of IEEE PES Subcommittee on Distributed Generation & Energy Storage and Vice Chair of IEEE PES Subcommittee on Research in Power & Energy Education. He is Affiliate Associate Professor at the University of Washington, Seattle. Dr. Strunz has been active on editorial boards and co-manages the operation of the Power Globe email forum. He was Review Editor for the IPCC (Intergovernmental Panel on Climate Change) from 2009 to 2011.



Résumé of ISGT Europe 2012

Noel Schulz, IEEE PES President and Kansas State University, USA

Noel Schulz is IEEE PES President (2012-2013), Associate Dean for Research & Graduate Programs and Paslay Professor at Kansas State University, USA. She received her B.S.E.E. and M.S.E.E. degrees from Virginia Tech in 1988 and 1990, respectively. She received her Ph.D. in EE from the University of Minnesota in Minneapolis in 1995. Dr. Schulz spent eight years at Mississippi State University (MSU) and has of over 19 years of teaching experience including other schools such as Michigan Technological University, University of North Dakota and Virginia Tech. She received the U.S. National Science Foundation CAREER award.

Dr. Schulz is a member of Eta Kappa Nu (Electrical Engineering Honorary Society), Tau Beta Pi (Engineering Honor Society), the American Society for Engineering Education (ASEE), the Society of Women Engineers, and the National Society of Black Engineers. She served on the Board of Directors for ASEE from 2008-2010.



Outlook on ISGT Europe 2013

Jacob Østergaard, Conference Chair IEEE PES ISGT Europe 2013 in Copenhagen and Technical University of Denmark, Denmark

Since 2005 Jacob Østergaard has been Professor in Electric Power Engineering and head of Center for Electric Power and Energy at Department of Electrical Engineering at Technical University of Denmark. Earlier he has been employed in industry at the Research Institute of Danish Electric Utilities, DEFU, for ten years. He is responsible for leading the Center with 85 staff members and the development of PowerLabDK.

Professor Østergaard serves on several boards and organizations, including chair of the Danish experimental platform, chair of the IEEE PES Danish chapter, member of the Advisory Council for the European technology platform Smart Grids and member of the Smart Grid advisory network of the Danish Minister of Climate and Energy.

8 Layout & Listing

The following companies participate in the exhibition from Monday, October 15, to Wednesday, October 17, from 09:30 h to 17:30 h, respectively.





8 Exhibitor Information



A. Eberle

A. Eberle GmbH was founded in 1980. Our most important fields in business comprise today: voltage regulation of tap-changing transformers and transformer monitoring; low voltage regulation of distribution transformers; regulation of Peterson coils and earth fault locating in medium and high voltage networks; voltage quality measuring – power quality – according to the standards EN50160 and IEC61000-4-30 with fault recorder function; early detection of network breakdowns – collapse prediction – and monitoring of network dynamics; calibration and simulation technology for multi-line systems. Our aim is to solve all measuring, control and recording tasks in relation to transformers and Peterson coils.

www.a-eberle.de



DIgSILENT

DIgSILENT GmbH is a software and consulting company providing highly specialized services in the field of electrical power systems for transmission, distribution, generation, industrial plants and renewable energies. DIgSILENT develops a leading integrated power system analysis software covering the full range of standard and highly sophisticated applications.

www.digsilent.de



EIT ICT Labs

EIT ICT Labs is a Knowledge and Innovation Community (KIC) supported by the European Institute of Innovation & Technology (EIT). Our mission is to turn Europe into a global leader in Information and Communication Technologies – ICT innovations. One of our focus topics is Smart Energy Systems where we aim to develop breakthrough ideas and innovative ICT technologies for sustainable future energy supply.

www.eitictlabs.eu



ETAP

ETAP offers a suite of fully integrated Electrical Engineering software solutions including arc flash, load flow, short circuit, transient stability, relay coordination, cable ampacity, optimal power flow, and more. Its modular functionality can be customized to fit the needs of any company, from small to large power systems.

www.etap.com

FUSS•EMV

FUSS-EMV

In 1986 we developed our first interference suppression filter – since then the specialists of the Ing. Max Fuss GmbH deal with EMC (Electromagnetic Compliance). Experience gained by the fabrication of electromechanical controllers, transformers and rectifiers from the company's foundation in 1908 was of advantage. As a leading supplier in the field of EMC interference suppression these days we offer to our customers service and support oriented problem solving. As a medium-sized business we have lean management to provide short development periods, short production periods and times of delivery to the customer.

www.fuss-emv.de



IEEE Power & Energy Society

The IEEE Power & Energy Society (PES), established leader of the Smart Grid community and the sponsor of the global series of ISGT regional conferences, is a worldwide, non-profit association of more than 28,000 individuals engaged in the electric power energy industry. Our mission is to be the leading provider of scientific information on electric power and energy for the betterment of society and the preferred professional development source for our members.

www.ieee-pes.org

8 Exhibitor Information (continued)



IEEE Smart Grid Initiative

The IEEE Smart Grid Initiative supports IEEE activities guiding modernization of the electrical power system typified by increased use of communications and information technology in the generation, delivery and consumption of electrical energy. Because IEEE touches virtually every aspect of Smart Grid, the IEEE Smart Grid Initiative is one of the very few efforts able to delivers the diversity of global expertise, information, resources, standards and the vision necessary to realize the Smart Grid's full potential. The IEEE Smart Grid Web Portal disseminates unbiased knowledge from IEEE Smart Grid experts and the monthly IEEE Smart Grid Newsletter covers timely developments.

smartgrid.ieee.org



imc Meßsysteme

By focusing on test and measurement productivity, imc Meßsysteme GmbH creates tools that empower engineers to deploy data acquisition systems and test strategies efficiently. Specializing in an integrated approach to physical test and measurement, imc offers solutions that are well-suited to testing of electrical networks and electromechanical systems. From stationary power quality, e-mobility and in-vehicle testing all the way to smart grid data recording, imc solutions and services are geared to meet customers test and measurement challenges.

www.imc-berlin.de



Neplan by BCP Switzerland

NEPLAN is a user-friendly and fully integrated Power System Analysis software tool for electrical networks. The software is available as desktop- and browser-based solution and suits best for integration in SmartGrid, Renewable Energy and Storage projects through C/C++ API or web services and for application in Research.



OPAL-RT Europa

Opal-RT Europe is a company that conceives and distributes innovative digital simulation solutions dedicated to all industries and research laboratories. Opal-RT is a world leader in the development of PC/FPGA Based Real-Time Digital Simulator, Hardware-In-the-Loop (HIL) testing equipment and Rapid Control Prototyping (RCP) systems to design, test and optimize control and protection systems used in power grids, power electronics, motor drives, automotive industry, trains, aircrafts and various industries, as well as R&D centers and universities.

www.opal-rt.com

Power Plus Communications

Power Plus Communications AG (PPC), Mannheim, is a leading provider of Broadband Powerline communication (BPL) systems for Smart Metering and Smart Grids. PPC's customers are leading European DNOs and utilities, including E.ON, WPD and EnBW and MVV Energie AG. Shareholders are Climate Change Capital Private Equity, Siemens Financial Services, British Gas, PPC's Managing Directors and employees.

www.ppc-ag.de

Vattenfall



PP(

Vattenfall's vision is to create a strong and diversified European energy portfolio with sustainable and increased profits, significant growth options and will be among the leaders in developing environmentally sustainable energy production.

Vattenfall Europe Distribution is responsible for the secure and reliable operation of the power distribution network in the cities of Berlin and Hamburg.

www.vattenfall.de

www.neplan.ch

8 Exhibitor Information (continued)

WILEY Wiley Wiley

Wiley is a global publisher of print and electronic products, specializing in scientific, technical, and medical books and journals; professional and consumer books and subscription services; and textbooks and other educational materials for undergraduate and graduate students as well as lifelong learners. Wiley publishes in a variety of formats.

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9 Supporter Information

Platinum Supporter



China Power International New Energy Holding Ltd.

China Power International New Energy Holding Ltd. (CPINE) was established in Shanghai in December, 2006 by China Power International Limited, a key enterprise under China Power Investment Corporation, one of top five largest power generation groups. CPINE is a new energy enterprise established within the framework of "Three Step Strategy" in China Power Investment and "developing the new energy industry in a better and faster way" by the Chairwoman Ms. Xiaolin Li in China Power International Limited. Core business areas of CPINE include wind power, biomass power, hydropower, natural gas power, solar power, etc... More information is available on the website.

www.cpire.com.cn

Gold Supporter



Vattenfall

Vattenfall's vision is to create a strong and diversified European energy portfolio with sustainable and increased profits, significant growth options and will be among the leaders in developing environmentally sustainable energy production.

Vattenfall Europe Distribution is responsible for the secure and reliable operation of the power distribution network in the cities of Berlin and Hamburg.

www.vattenfall.de

9 Supporter Information (continued)

Silver Supporters



50Hertz

50Hertz takes care of the operation and the expansion of the transmission network. Moreover, the company is responsible for managing the overall electrical system throughout the eastern part of Germany plus Hamburg and Berlin. As transmission system operator active in the Central European market, 50Hertz is responsible for the secure integration of renewable energies, the development of the European electricity market and for maintaining a high level of security of supply.

www.50hertz.com

ALSTOM Alstom Grid

Alstom Grid is a world leading manufacturer of engineered solutions for smart and conventional electrical grid applications for utilities and industries. It provides integrated and customised turnkey solutions such as alternating current (AC) and direct current (DC) substations, from medium (MV) up to ultra high (UHV) voltages, whatever the distance, the climate, the interconnection challenge, the diversity of power sources and the complexities of the local, regional or continental network.

The solutions developed by Alstom Grid enable the transmission of electricity as efficiently as possible and support the development of the Smart Grid: a real-time bi-directional network of energy and information which enhances the reliability and efficiency of the electrical grid. Alstom also plays a leading role in Supergrid development, which connects renewable energy sources across countries and continents to supply clean energy to the final consumer.

www.alstom.com/grid



ABB

ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 145,000 people. The business units are Power Products, Power Systems, Discrete Automation, Low Voltage Products, and Process Automation.

www.abb.com



SILENT

NBB Netzgesellschaft Berlin-Brandenburg

The company ensures a technically and economically proper operation of the gas supply in the region of Berlin and Brandenburg. Among the core business is the secure, disturbance-free, and efficient network operation, the maintenance and extension of the network infrastructure, and the task of securing network access to numerous gas providers. Today, the company bears the technical and commercial responsibility for networks in more than 100 cities and municipalities in Berlin and Brandenburg.

www.nbb-netzgesellschaft.de

Bronze Supporters

DIgSILENT

DIgSILENT GmbH is a software and consulting company providing highly specialized services in the field of electrical power systems for transmission, distribution, generation, industrial plants and renewable energies. DIgSILENT develops a leading integrated power system analysis software covering the full range of standard and highly sophisticated applications.

www.digsilent.de

9 Supporter Information (continued)



ILF Consulting Engineers

Whether it is the extraction of natural raw materials under difficult conditions, the development of innovative industrial plants or the supply of water and energy to a metropolis - it is mostly the art of engineering which facilitates and safeguards the sustainable development of mankind and improves the quality of life.

ILF Consulting Engineers (ILF) consists of several international and independent engineering and consulting companies. ILF helps demanding customers successfully execute complex industrial and infrastructure projects. Today, the ILF companies rank among the world's leading engineering firms in the areas of their core expertise.

www.ilf.com



TSB Innovationsagentur Berlin

The TSB Innovation Agency's main services are cluster management, network initiation and management as well as tech transfer. The department of Energy Technology focuses on innovation and technology promotion in the fields of solar energy, turbo engines and power plant technologies, energy efficiency technologies, energy grids and storage, electromobility, wind and bio energy and clean technologies.

This project is supported by funds of the TSB Innovation Agency Berlin GmbH, sponsored by the State of Berlin and the Berlin Investment Bank co-financed by the European Union, European Regional Development Fund. Investment in your future.



www.tsb-berlin.de/tsb-berlin/seite/de/2/2/0/0/die-innovations-agentur



New power grids for new energy

The power grid is key to the success of the renewable energy revolution in Germany.

50Hertz have pioneered the integration of renewable energies. We operate the extrahigh voltage grid supplying power to more than 18 million people throughout northern and eastern Germany. We embrace our societal responsibility and are committed to developing power grids in line with the German and European climate control targets.

This goal requires changes to the political framework:

- To support the required network expansion, we need stable investment conditions, expedited procedures and a politically backed information initiative that fosters dialogue.
- The legal and regulatory framework must ensure that the necessary massive investments into network expansion can be carried out and investment barriers are removed.

















Notes

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