Preliminary Workshop Program

The 8th Workshop is sponsored by:

The 8th Workshop is supported by:

The 8th Workshop is organized by:

Program as of 10/10/2009

Workshop Overview

Tuesday 13 Oct	Wednesday 14 Oct			Thursday 15 Oct			Friday 16 Oct
Tutorials	**8:00 - 9:00**						
	Entrance Hall Registration						
09:00-13:00	**9:00 – 11:00**			**08:30-10:40**			**07:30 - 18:00**
	Room Hanse			**Room Hanse**	**Room Kaisen**	**Room Borgward**	**Field Trip** **i) HVDC Light converter station for the BorWin1 project** **and / or** **ii) wind turbine manufacturer ENERCON** **and / or** **iii) BARD Engineering**
	Welcome and Session 1 Keynote Session & Panel			Session 5a IEA Task 25	Session 5b Grid Code Issues	Session 5c Market Issues	
	11:00 – 11:25			**10:40 – 11:00**			
	Coffee Break			Coffee Break			
	11:25 – 13:00			**11:00 – 13:00**			
	Room Hanse	**Room Kaisen**	**Room Borgward**	**Room Hanse**	**Room Kaisen**	**Room Borgward**	
	Session 2a Grid Integration Studies & Experience: Europe	Session 2b Connection of Offshore Wind Farms	Session 2c Wind Forecast I	Session 6a Offshore Grid	Session 6b Modeling I	Session 6c Wind Power and Storage	
	13:00 – 14:00			**13:00 – 14:00**			
	Lunch			Lunch			
14:00-18:00	**14:00 – 15:40**			**14:00 – 15:40**			
	Room Hanse	**Room Kaisen**	**Room Borgward**	**Room Hanse**	**Room Kaisen**	**Room Borgward**	
	Session 3a HVDC	Session 3b German Grid Code Issues	Session 3c Wind Forecast II	Session 7a Power System Balancing	Session 7b Wind Turbine Performance	Session 7c Modeling and Offshore Transformer	
	15:40 – 16:00			**15:40 – 16:00**			
	Coffee Break & Poster Session			Coffee Break & Poster Session			
	16:00 - 18:20	**16:00 - 18:20**	**16:00 - 19:00**	**16:00 – 17:00**			
	Room Hanse	**Room Kaisen**	**Room Borgward**	**Room Hanse**			
	Session 4a Offshore Grid Connection	Session 4b Grid Integration Studies & Experience: North America	Session 4c SUPWIND – Decision Support Tools for Large Scale Integration of Wind / Windgrid: Wind on the Grid: An Integrated Approach	Session 8 Closing Session – Podium discussions			
18:00 - 20:00 **Conference Hotel**	**20:00** **Workshop Dinner**						
Reception, **Registration** & Snack	Shuttle Service between Hotel Maritim and Hudson Loft 19.00-20.00 and 23.00-00.00						

Tuesday 13 October 2009

18:00 – 20:00 Registration

Wednesday 14 October 2009

08:00 – 09:00 Registration

09:00 – 09:20 Opening

09:00 – 09:10 Welcome and introduction, Thomas Ackermann

09:10 – 09:15 Structure of the workshop

09:15 – 11:00 Session 1: Keynote Session & Panel

09:15 – 10:35 Presentations (20 minutes each):

- **Europe Going Renewable: The TSOs' Power Transmission Challenges,** A. G. Orths, P.B. Eriksen (Energinet.dk, Denmark)
- **European Wind Integration Study**, L. Dale (National Grid, United Kingdom), L. Fischer (Vattenfall, Germany), D. Klaar (Tennet, The Netherlands), O. Alonso (REE, Spain), H. Vanderbroucke (ELIA, Belgium), K. Kolharkar (Transpower, Germany), W. Winter (Transpower, Germany), M. Uusitalo (NORDEL, Finland)
- **European Electrical Transmission System Export Capability for Increasing Wind Power Penetration,** S. Beharrysingh, F. Van Hulle, (EWEA, Belgium)
- **Transmission Planning for Wind Energy: Status and Prospects,** J. C. Smith (UWIG;USA), D. Osborn (MISO, USA), R. Piwko (GE, USA), R. Zavadil (Enernex, USA), B. Parsons (NREL, USA) D. Hawkins (CAISO, USA), W. Lasher (ERCOT, USA), B. Nickell (WECC, USA)

10:35 – 11:00 Discussions, discussion leader: Thomas Ackermann (Energynautics, Germany)

11:00 – 11:25 Coffee break

11:25 – 13:00 Session 2a: Grid Integration Studies and Experience: Europe

11:25 – 12:45 Presentations (20 minutes each):

- **Wind Energy Integration in the Spanish Electrical System,** O. Alonso Garcia, M. de la Torre Rodríguez, E. Prieto García, S. Martínez Villanueva, J. M. Rodríguez García (REE, Spain)
- **Efficient Integration of Wind Energy at EnBW TSO,** D. Graeber, O. Chatillon (EnBW, Germany)
- **Integrating Massive Wind Power in the Electric System: Acciona Experience in Spain,** E. Giraut Ruso, J. Ruiz Guillén, G. Quiñonez Varela, I. Armendáriz Otazu, A. Navarrete Pablo-Romero, C. Moreira Prada, G. Alday Aracama, R. Sánchez Ardoiz, J. Moreno Fernandez (Acciona Energía, Spain)

- **Future Challenges of the Danish Power System –Results of Ecogrid.dk – Phase 1,**T. Ackermann (Energynautics, Germany), K. Norregaard (Teknologisk Institute, Denmark), P.-F. Bach, M. Lind (CET-DTU, Denmark), P. Sorensen (Risø-DTU, Denmark), B. Tennbakk (Econ Pöyry AS, Denmark), M. Togeby (EA Energy Analyses, Denmark), J. Ostergaard (CET-DTU, Denmark)

12:45 – 13:00 Discussions, discussion leader: Antje G. Orths (Energinet.dk, Denmark)

11:25 – 13:00 Session 2b: Connection of Offshore Wind Farms

11:25 – 12:45 Presentations (20 minutes each):

- **Experience of transpower offshore with the first F50two grid connection projects for offshore wind parks (alpha ventus as an HVAC single connection and BARD Offshore 1 as an HVDC cluster connection),** T. J. Lebioda, D. Zhang (transpower, Germany)
- **Innovative platform solutions with integrated design for offshore AC substations from 60 MW to 800 MW -experience from realized projects and future challenges,** Sven Höpfner; Uwe Gierer (AREVA Energietechnik, Germany), Richard Cooke (AREVA T&D UK, United Kingdom)
- **Integration of Offshore Wind with Modern HVDC Technology,** G. Stark (ABB, Germany)
- **International Grid solution at Kriegers Flak involving both Offshore Wind Power Plant and Interconnector Capacity,** H. K. Nielsen, P. B. Eriksen (Energinet.dk, Denmark)

12:45 – 13:00 Discussions, discussion leader: Sigrid. M. Bolik (REpower UK, United Kingdom)

11:25 – 13:00 Session 2c: Wind Forecast I

11:25 – 12:45 Presentations (15 minutes each):

- **Reduction of Wind Power Induced Reserve Requirements by Advanced Shortest-Term Forecasts and Prediction Intervals,** J. Dobschinski, A. Wessel, B. Lange, L. von Bremen (IWES/ISET, Germany)
- **Performance and Benefits of Ensemble Prediction Systems,** M. Denhard (ECMWF, United Kingdom), T. I. Petroliagis, J. Tambke (ForWind/University of Oldenburg, Germany), R. Hagedorn (ECMWF, United Kingdom)
- **A new algorithm for Upscaling and Short-term forecasting of Wind Power Using Ensemble Forecasts**, C. Möhrlen (WEPROG, Germany), J. U. Jørgensen (WEPROG, Denmark)
- **Integration of Offsite Wind Speed Measurements in Shortest-term Wind Power Prediction Systems,** A. Wessel, J. Dobschinski, B. Lange (IWES/ISET, Germany)
- **Operational Experience with the Optimal Combination of Weather Models for Improved Wind Power Predictions,** M. Lange, U. Focken, K. Peters (energy & meteo systems, Germany)

12:45 – 13:00 Discussions, discussion leader: Gregor Giebel (Risø-DTU, Denmark)

13:00 – 14:00 Lunch

14:00 – 15:40 Session 3a: HVDC

14:00 – 15:20 Presentations (20 minutes each):

- **HVDC with Voltage Source Converters – A Desirable Solution for connecting Renewable Energies,** Y. Jiang-Häfner, R. Ottersten (ABB, Sweden)
- **Multi-Terminal HVDC System for Large Offshore Wind Farm Integration and Transmission Network Support**, L. Xu (Queen's University Belfast, United Kingdom), Y. Wang (North China Electric Power University, China), L. Yao, J.-L. Rasolonjanahary (AREVA, United Kingdom)
- **Grid connection of Krieger's Flak,** Å. Larsson (Vattenfall, Sweden)
- **Simulation Study of Wind Power Plant, VSC-HVDC and Grid Integrated System,** Sanjay K. Chaudhary, R. Teodorescu, R.N. Mukerjee (Aalborg University, Denmark), P. Rodriguez (Technical University of Catalonia, Spain), P.C. Kjær, P. W. Christensen (Vestas, Denmark)

15:20 – 15:40 Discussions, discussion leader: Peter W. Christensen (Vestas, Denmark)

14:00 – 15:40 Session 3b: German Grid Code Issues

14:00 – 15:20 Presentations (20 minutes each):

- **Compliance with Technical Codes Becomes Obligatory for Receipt of Feed-in Tariff and Ancillary Services Bonus for Wind Power Plants in Germany,** J. C. Boemer, K. Burges (Ecofys, Germany), T. Kumm (VDE/FNN, Germany), M. Pöller (DIgSILENT, Germany)
- **Validation of an RMS DFIG Simulation Model According to New German Model Validation Standard FGW TR4 at Balanced and Unbalanced Grid Faults,** J. Fortmann (REpower, Germany), S. Engelhardt, J. Kretschmann (Woodward, Germany), C. Feltes, I. Erlich (University of Duisburg-Essen, Germany)
- **Certification of Advanced Electrical Characteristics based on Validation of WEC Models and Simulation of Wind Farms,** B. Schowe-von der Brelie, H. Vennegeerts (FGH, Germany) M. Schellschmidt (ENERCON, Germany)
- **Role of Regulations and Standards for the Grid Connection of Wind Turbines - Integrating more Wind Energy,** M. Ibsch, K. Nohme (WINDTEST, Germany)

15:20 – 15:40 Discussions, discussion leader: Markus Pöller (DIgSILENT, Germany)

14:00 – 15:40 Session 3c: Wind Forecast II

14:00 – 15:20 Presentations (20 minutes each):

- **Transformer Congestion Forecast Based on Highly Localized Wind Power Predictions,** U. Focken (energy & meteo systems, Germany), J. Jahn (EWE, Germany), M. Schaller (energy & meteo systems, Germany)
- **Impact of Wind Power Forecasting on Unit Commitment and Dispatch,** J. Wang, A. Botterud, G. Conzelmann (Argonne National Laboratory, USA), V. Miranda, C. Monteiro, G. Sheble (INESC Porto, PORTUGAL)
- **Estimation of the increased ampacity of overhead power lines in weather conditions with high wind power production,** M. Lange, U. Focken (energy & meteo systems, Germany)
- **Temporal Forecast Uncertainty for Ramp Events,** B. Greaves, J. Collins, J. Parkes, A. Tindal (Garrad Hassan, UK)

15:20 – 15:40 Discussions, discussion leader: Corinna Möhrlen (WEPROG, Germany)

15:40 – 16:00 Coffee break & Poster Session

16:00 – 18:20 Session 4a: Offshore Grid Connection

16:00 – 18:00 Presentations (20 minutes each):

- **Strategies for Offshore Windpark Clustering and Cluster Grid Connection,** T. Ahndorf, R. Witzmann (Technical University of Munich, Germany)
- **Optimising Redundancy of Offshore Electrical Infrastructure Assets by Assessment of Overall Economic Cost**, A. R. Henderson, L. Greedy, F. Spinato, C. A Morgan (Garrad Hassan, UK)
- **Analysis of Switching Overvoltages in Offshore Transmission Systems,** H. Brakelmann, T. Dong (University Duisburg-Essen, Germany)
- **Offshore Transformer Platform Design,** T. Boehme, G. MacAngus Gerrard (Det Norske Veritas, UK**)**
- **Optimisation of Onshore Bipolar HVAC Cable Systems,** H. Brakelmann (University Duisburg-Essen, Germany)
- **Onshore Continuation of Bipolar Cable Systems for Bulk Wind Power Transmission,** H. Brakelmann, J. Brüggmann, J. Stammen (University Duisburg-Essen, Germany)

18:00 – 18:20 Discussions, discussion leader: Ralph Hendriks (Siemens, Germany)

16:00 – 18:20 Session 4b: Grid Integration Studies: North America

16:00 – 18:00 Presentations (20 minutes each):

- **How do Wind and Solar Power Affect Grid Operations: The Western Wind and Solar Integration Study,** D. Lew, M. Milligan (National Renewable Energy Laboratory, USA), G. Jordan, L. Freeman, N. Miller, K. Clark, R. Piwko (GE Energy, USA)
- **Eastern Wind Integration and Transmission Study - Preliminary Findings,** D. Corbus, M. Milligan, E. Ela (National Renewable Energy Laboratory, USA), M. Schuerger (Energy Systems, USA), B. Zavadil (EnerNex, USA),
- **Impacts of Large Scale Integration of Wind Power into the Power System of British Columbia,** T. Broeer, N. Djilali, A. Rowe (University of Victoria, Canada)
- **Assessment of AGC and Load-Following Definitions for Wind Integration Studies in Québec,** I. Kamwa, A. Heniche, M. de Montigny (Hydro-Québec, Canada)
- **Wind Power Integration into Los Angeles Electric System,** M. Beshir (Los Angeles Department of Water and Power, USA)
- **Risks of Extreme Wind Generation Output Changes in the ERCOT Market,** R. Walling, L. Freeman, N. Miller (GE Energy, USA), J. Freedman (AWS Truewind, USA), W. Lasher (ERCOT, USA)

18:00 – 18:20 Discussions, discussion leader: Charles Smith (UWIG, USA)

16:00 – 19:00 Session 4c: SUPWIND / Windgrid

Part I: SUPWIND - Decision Support Tools for Large Scale Integration of Wind[1]

16:00 – 17:40 Presentations (20 minutes each):

- **Impacts of Intra-day Rescheduling of Unit Commitment and Cross Border Exchange on Operational Costs in European Power Systems,** P. Meibom (Risø DTU, Denmark), C. Weber (Universityof Duisburg-Essen, Germany)
- **Estimating Tertiary Reserves in the Danish Electricity System,** T. Kristoffersen, P. Meibom (Risø-DTU, Denmark), A. Gøttig (Energinet.dk, Denmark)
- **Network and Power Plant Investments - Country Case Study With High Wind Power Penetration,** J. Apfelbeck (University of Stuttgart, Germany), P. Vogel (University Duisburg-Essen, Germany), R. Barth (University of Stuttgart, Germany), D. Bechrakis (HTSO, Greece), H. Brand (University of Stuttgart, Germany), J. Kabouris (HTSO, Greece)
- **Load-flow Based Market Coupling with Large-scale Wind Power in Europe,** R. Barth, J. Apfelbeck (University of Stuttgart, Germany), P. Vogel (University of Duisburg-Essen, Germany), P. Meibom (Risø-DTU, Denmark), C. Weber, (University of Duisburg-Essen, Germany)
- **Investmentplanning of Interconnectors under consideration of wind power extensions in Europe,** S. Spiecker, P. Vogel, C. Weber (University of Duisburg-Essen, Germany), C. Obersteiner (Technical University Vienna, Austria)

17:40 – 18:00 Discussions, discussion leader: Prof. Christoph Weber (University of Duisburg-Essen, Germany)

Part II: Windgrid - Wind on the Grid: An Integrated Approach[2]

18:00 – 18:50 Presentations: Further details to be announced

- **Project presentation and overview,** M. Lorenzo (REE, Spain)
- **System security management,** E. Doheijo, E. Martín (Deloitte)
- **Technical Solutions: Wind Cluster Management System,** N.N. (IWES/ISET, Germany)
- **Field Tests,** E. Quitmann (ENercon, Germany)

18:50 – 19:00 Discussions, discussion leader: Prof. Christoph Weber (University of Duisburg-Essen, Germany)

20:00 Conference Dinner

[1] http://supwind.risoe.dk/
[2] http://www.windgrid.eu/

Thursday 15 October 2009

08:30 – 10:40 Session 5a: IEA Task 25[3]

08:30 – 10:20 Presentations (22 minutes each):

- **Impacts of Large Amounts of Wind Power on Design and Operation of Power Systems, Results of IEA Collaboration,** H. Holttinen (VTT, Finland), P. Meibom (Risø DTU, Denmark), A. Orths (Energinet.dk, Denmark), B. Lange (IWES/ISET, Germany), M. O'Malley (University College Dublin, Ireland), J.O. Tande (SINTEF, Norway), A. Estanqueiro (INETI, Portugal), E. Gomez (University Castilla-La Mancha, Spain), L. Söder (KTH - Royal Institute of Technology, Sweden), G. Strbac (DG&SEE, UK), J.C. Smith (UWIG, USA), F. Van Hulle (EWEA, Belgium)
- **Large-Scale Wind Integration Studies in the United States: Preliminary Results,** M. Milligan, D. Lew, D. Corbus (NREL, USA), R. Piwko, N. Miller, K. Clark, G. Jordan, L. Freeman (GE Energy, USA), B. Zavadil (EnerNex, USA), M. Schuerger (Energy Systems Consulting, USA)
- **Calculation of Balancing Reserve Incorporating Wind Power into the Hydro-Quebec System over the Time Horizon of 1-48 Hours,** N. Menemenlis, M. Huneault (IREQ-Hydro-Québec, Canada), J. Bourret, A. Robitaille (Hydro-Québec, Canada)
- **Coping with Wind Power Variability: How Plug-in Electric Vehicles ould Help,** J. Kiviluoma (VTT, Finland), P. Meibom (Risø-DTU, Denmark)
- **Evaluating which Forms of Flexibility most Effectively Reduce Base-load Cycling at Large Wind Penetrations,** N. Troy (University College Dublin, Ireland), E. Denny (Trinity College Dublin, Ireland), Mark O'Malley (University College Dublin, Ireland)

10:20 – 10:40 Discussions, discussion leader: Hannele Holttinen, VTT, Finland

08:30 – 10:40 Session 5b: Grid Codes Issues

08:30 – 10:20 Presentations (18 minutes each):

- **Grid Connection of Large Wind Power Plants: a European Overview,** A. R. Ciupuliga, M. Gibescu (Delft University of Technology, The Netherlands), G. Fulli (DG Joint Research Centre – European Commission, The Netherlands), A. L'Abbate (ERSE, Italy), W. L. Kling (Delft University of Technology, The Netherlands)
- **Grid Code Compliance Beyond LVRT,** Tobias Gehlhaar (Germanischer Lloyd, Germany)
- **The Development of Connection Requirements for Offshore Generation and Transmission in Great Britain,** A. Johnson, N. Tleis, J. Greasley (National Grid, U.K.)
- **Grid Code Compliance Process of Wind Farms in Great Britain,** S. M. Bolik (REpower UK, UK)
- **Compliance of REE's Operational Procedure 12.3 Regarding Fault Ride-Through Capability: The Experience of a Multi-technology Owner,** J. Ruiz Guillén, E. Giraut Ruso, G. Quiñones-Varela, Á. Navarrete Pablo-Romero, I. Rebollo Rico, T. Hernández Fernández de la Pradilla (Acciona Energía, Spain), M. Paz Comench, M. García-Gracia (CIRCE - University of Zaragoza, Spain)
- **Fault Ride Through Test based on Transformer Switching,** R. Klosse, F. Santjer (DEWI, Germany)

10:20 – 10:40 Discussions, discussion leader: Anthony Johnson (UK Grid, United Kingdom)

[3] http://www.ieawind.org/AnnexXXV.html

08:30 – 10:40 Session 5c: Market Issues

08:30 – 10:20 Presentations (18 minutes each):

- **Rules and Mechanisms for Integrating Wind Power in Electricity Markets,** A. Waltham (IPA Economics, UK)
- **A Modeling Approach to Compute Scenarios of Electricity Generation from Wind and other Renewable Energy Sources in Europe,** C. Golling, D. Lindenberger (University Cologne, Germany)
- **Imbalance Costs in the Swedish System with Large Amounts of Wind Power,** F. Carlsson, V. Neimane (Vattenfall, Sweden)
- **Allocation of Interconnector Capacity with In-between Stochastic Generation,** S. T. Schröder (Risø - DTU, Denmark)
- **Effect of wake consideration on estimated cost of wind energy curtailments,** M. Ali (University of Manchester, UK), J. Matevosyan (Parsons Brinckerhoff, UK), J. V. Milanović (University of Manchester, UK), L. Söder (KTH - Royal Institute of Technology, Sweden)

10:20 – 10:40 Discussions, discussion leader: Peter Meibom (Risø-DTU, Denmark)

10:40 – 11:00 Coffee break

11:00 – 13:00 Session 6a: Offshore Grid

11:00 – 12:20 Presentations (20 minutes each):

- **The IEE Project OffshoreGrid: Objectives, Approach and First Results,** J. De Decker, A. Woyte (3E, Belgium), C. Srikandam, J. Völker, C. Funk (dena, Germany), K. Michalowska-Knap (EC BREC IEO, Poland), J. Tambke (ForWind – University Oldenburg, Germany), G. Rodrigues (EWEA, Belgium)
- **Cluster Interconnection of Offshore Wind Farms using a Direct AC High Frequency Links,** A. Garcés Ruiz, M. Molinas (Norwegian University Of Science and Technology Trondheim, Norway)
- **Interconnection of Direct-Drive Wind Turbines Using DC Grid,** E. Veilleux, P. W. Lehn (University of Toronto, Canada)
- **6 GW Offshore Wind Power in The Netherlands - Technology Options and Connection Configurations,** K. Burges (Ecofys, Germany), D. Schoenmakers (Ecofys, The Netherlands), G. Papaefthymiou (Ecofys, Germany)

12:20 – 13:00 Discussions, discussion leader: Thomas Ackermann (Energynautics, Germany)

11:00 – 13:00 Session 6b: Modeling I

11:00 – 12:40 Presentations (20 minutes each):

- **Reduced Order Model of Wind Turbines based on Doubly-Fed Induction Generators during Voltage Imbalances,** S. Engelhardt (Woodward SEG, Germany), C. Feltes (University Duisburg-Essen, Germany), J. Fortmann (REpower, Germany), J. Kretschmann (Woodward SEG, Germany), I. Erlich (University Duisburg-Essen, Germany)
- **Contribution of Wind Energy Converters with Inertia Emulation to Frequency Control and Frequency Stability in Power Systems,** S. Wachtel, A. Beekmann (ENERCON, Germany)
- **Models and Simulations for the Danish Cell Project: Running PowerFactory with OPC and Cell Controller,** N. Martensen, E. Tröster, P. Lund, R. Holland (Energynautics, Germany)
- **Large Wind Power Plants Modeling Techniques for Power System Simulation Studies,** C. Larose, R. Gagnon, G. Turmel, P. Giroux, J. Brochu, D. McNabb, D. Lefebvre (Hydro Québec Canda)

12:40 – 13:00 Discussions, discussion leader: V. Akhmatov (Siemens Wind Power, Denmark)

11:00 – 13:00 Session 6c: Wind Power and Storage

11:00 – 12:20 Presentations (20 minutes each):

- **A Full Renewable Power Supply Scenario for Europe: The Weather Determines Storage and Transport,** L. von Bremen (IWES/ISET, Germany), M. Greiner (Siemens, Germany), K. Knorr (IWES/ISET, Germany), C. Hoffmann (Siemens, Germany), S. Bofinger, B. Lange (IWES/ISET, Germany)
- **Wide-Area Energy Storage and Management System to Balance Intermittent Resources in the Bonneville Power Administration and California ISO Control Areas,** Y. V. Makarov, B. Yang, J. G. DeSteese (Pacific Northwest National Laboratory, USA), P. Nyeng (DTU, Denmark), C. H. Miller (Pacific Northwest National Laboratory, USA), J. Ma, S. Lu, V.V. Viswanathan, D.J. Hammerstrom (Pacific Northwest National Laboratory, USA), B. McManus, J. H. Pease (Bonneville Power Administration, USA), C. Loutan, G. Rosenblum (California ISO, USA)
- **Grid Scale Energy Storage in Salt Caverns,** Fritz Crotogino, Sabine Donadei, (KBB Underground Technologies, Germany)
- **Operational Experience with Virtual Power Plants – Efficient Integration of Small Scale Generation and Medium Scale Demand into the Power System**, U. Focken, T. Klose (energy & meteo systems, Germany), W. Krause (EWE, Germany)

12:20 – 13:00 Discussions, discussion leader: Alain Forcione (Institut de recherche d'Hydro-Québec – IREQ, Canada)

13:00 – 14:00 Lunch

14:00 – 15:40 Session 7a: Power System Balancing

14:00 – 15:20 Presentations (20 minutes each):

- **Assessing the Value of Regulation Resources Based on Their Time Response Characteristics,** Y. V. Makarov, J. Ma, S. Lu, T.B. Nguyen (Pacific Northwest National Laboratory, USA), C. Loutan, G. Rosenblum, S. Chowdhury (California ISO, USA), J.H. Eto (Lawrence Berkeley National Laboratory, USA), M. Gravely, M. Brown (California Energy Commission, USA)
- **Balancing with 6000 MW off shore Wind Energy in The Netherlands; an analysis of the flexibility of production,** W. de Boer, W. van der Veen (KEMA, The Netherlands)
- **Wind Power in the North Sea: Smoothing Effects and Penetration Rates in a 2020 Scenario,** N. Brodersen, K. Burges (Ecofys, Germany), O. Hohmeyer (Flensburg University, Germany)
- **Self-Regulating Wind Power: Matching Generation at Load,** R. Dackiw, S. V. Pasupulati, J. Soto (Oak Creek Energy Systems, USA)

15:20 – 15:40 Discussions, discussion leader: Julija. Matevosyan (Parsons Brinckerhoff, United Kingdom)

14:00 – 15:40 Session 7b: Wind Turbine Performance Analysis

14:00 – 15:20 Presentations (20 minutes each):

- **Small-Signal Stability Analysis of Full-Load Converter Interfaced Wind Turbines,** T. Knüppel (Siemens Wind Power, DTU, Denmark), V. Akhmatov, J. N. Nielsen, K. H. Jensen (Siemens Wind Power, Denmark), A. Dixon (National Grid, UK), J. Østergaard (DTU, Denmark)
- **Harmonic Analysis of Offshore Wind Farms with Full Converter Wind Turbines,** Ł. H. Kocewiak, J. H. Hjerrild (DONG Energy, Denmark), C. Leth Bak (Aalborg University, Denmark)

- **Investigating Power Control in Autonomous Power Systems with Increasing Wind Power Penetration**, I. D. Margaris (NTUA, Greece), A. D. Hansen, P. Sørensen (Risø-DTU, Denmark), N. Hatziargyriou (NTUA, PPC, Greece)
- **Voltage Dips Ride-Through Capability: Model Validation of a Resistance-Commutated Rotor Wind Turbine Generator from In-Field Testing Results,** M. A. Martinez Guillén, M. Paz Comech, J. Ruiz Guillén, E. Giraut Ruso, M. García-Gracia (C.P.S. University of Zaragoza, Spain)

15:20 – 15:40 Discussions, discussion leader: Stephan Wachtel (Enercon, Germany)

14:00 – 15:40 Session 7c: Modeling and Offshore Transformer

14:00 – 15:20 Presentations (20 minutes each):

- **Dynamic Simulations of Wind Farms with Standardized Test Routines in PSS®NETOMAC,** G. Duschl-Graw (Beuth University of Applied Sciences, Germany), D. Pannhorst (Ingenieurbüro Pannhorst, Germany), O. Ruhle (Siemens, Germany)
- **Aggregated Models of a Large Wind Farm Consisting of Variable Speed Wind Turbines for Power System Stability Studies,** A. Perdana, O. Carlson (Chalmers University of Technology, Sweden)
- **Transformers for Offshore Wind Platforms: Expected Problems and Possible Approaches**, B. Valov (ISET/ Fraunhofer-IWES, Germany)
- **Wind Turbine Transformer Admittance Characterization Based on Online Time-domain Measurements and Preliminary Results from Measurements done in two Transformers using a SFRA**, I. Arana (DONG Energy, Denmark), J. Holbøll (DTU, Denmark), T. Sørensen (DONG Energy, Denmark), A. H. Nielsen (DTU, Denmark)

15:20 – 15:40 Discussions, discussion leader: Jens Fortmann, REpower, Germany

15:40 – 16:00 Coffee break & Poster Session

16:00 – 17:00 Session 8: Podium Discussions

16:00 – 16:10 **UK wind integration experience**; Paul Gardner, Garrad Hassan, UK

16:10 – 17:00 Podium discussions:

- Participants: details to be announced

Discussion leader: Paul Gardner, Garrad Hassan, UK

17:00 – 17:05 Closing remarks

Friday 16 October 2009

Field Trip

Posters

Modeling and Power System Stability of VSC-HVDC Systems for Grid-Connection of Large Offshore Windfarms, Y. Xue (Vestas China, CHINA), V. Akhmatov (Technical University of Denmark, Denmark)

Determination of the phenonema involved when de-energing transformers for wind-farms: modelling, residual fluxes calculation and validation by on site tests, M. Rioual (EDF, France, Jean-C. Reveret (SUDRIA, France)

Stochastic Unit Commitment Considering Uncertain Wind Production in an Isolated System, K. Dietrich, J.-M. Latorre, L. Olmos, A. Ramos, I. Pérez-Arriaga (Comillas University, Spain)

Grid Connection-Oriented Modelling and Simulation of Frequency Response and Inertial Behaviour for Full Converter Wind Turbines, G. Taylor, D. D. Banham-Hall (Brunel University, UK), C. Smith (Converteam UK, UK), M.R. Irving (Brunel University, UK)

Pumped Heat Energy Storage of Electrictiy, J. Ruer (SAIPEM-SA, France)

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