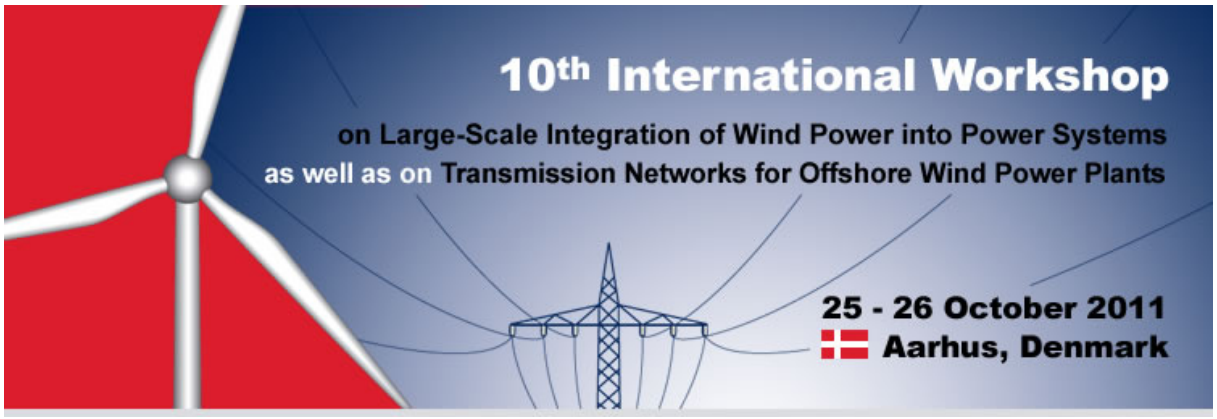

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Workshop Overview

Tuesday 25 Oct			Wednesday 26 Oct			Thursday 27 Oct
8:00 - 9:00			**8:00 - 8:30**			**Energinet.dk-day**
Foyer			**Foyer**			
Registration Morning Coffee/Tea			Morning Coffee/Tea			
9:00 - 10:55			**08:30 - 10:40**			**09:00**
Scandia Ballroom			**Room Suecia**	**Room Dania**	**Room Nortvegia**	**Room Suecia/Dania**
Welcome & Session 1 Keynote Session & Panel			Session 5a Market Issues	Session 5b Future High Penetration Aspects	Session 5c Offshore Grid Connection (Part II)	
10:55 - 11:25			**10:40 - 11:00**			**10:30 - 11:00**
Coffee Break & Poster Session			Coffee Break			Coffee Break
11:25 - 13:00			**11:00 - 13:00**			
Room Suecia	**Room Dania**	**Room Nortvegia**	**Room Suecia**	**Room Dania**	**Room Nortvegia**	
Session 2a Country Studies (Part I)	Session 2b Modeling (Part I)	Session 2c Wind Forecasting	Session 6a Smart Grid & Wind Power (Part I)	Session 6b Modeling (Part III)	Session 6c Offshore Grid Connection (Part III)	
13:00 - 14:00			**13:00 - 14:00**			**13:00 - 14:00**
Lunch			Lunch			Lunch
14:00 - 15:40			**14:00 - 15:40**			
Room Suecia	**Room Dania**	**Room Nortvegia**	**Room Suecia**	**Room Dania**	**Room Nortvegia**	
Session 3a Country Studies (Part II)	Session 3b Testing & Validation	Session 3c HVDC	Session 7a Frequency Control & Inertia	Session 7b Smart Grid & Wind Power (Part II)	Session 7c Wind Power Plant Aspects	
15:40 - 16:20			**15:40 - 16:10**			**15:40 - 16:00**
Coffee Break & Main Poster Session			Coffee Break & Poster Session			Coffee Break
16:20 - 18:50			**16:10 - 17:15**			
Room Suecia	**Room Dania**	**Room Nortvegia**	**Scandia Ballroom**			
Session 4a Power System Balancing (Part I)	Session 4b Offshore Grid Connection (Part I)	Session 4c Modeling (Part II)	Session 8 Closing Session – Podium Discussions			
20:00						
Workshop Dinner (Bus shuttle from 19:00)						

Monday 24 October 2011

17:00 – 20:00 Registration and Reception City Hall

Tuesday 25 October 2011

08:00 – 09:00 Registration

09:00 – 09:15 Opening

09:00 – 09:15 Welcome and structure of the workshop, Thomas Ackermann

09:15 – 10:55 Session 1: Keynote Session & Panel

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

- **Anne Højer Simonsen** (Deputy Permanent Secretary, Ministry of Climate and Energy of Denmark)
- **Torben Glar Nielsen** (Director, Energinet.dk, Denmark)
- **Finn Strøm Madsen** (President, Vestas Technology R&D, Denmark)
- **Invited (TBA)**

10:15 – 10:55 Discussions, discussion leader: Thomas Ackermann (Energynautics, Germany)

10:55 – 11:25 Coffee break & Poster Session

11:25 – 13:00 Session 2a: Country Studies - I

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

- **Western Wind and Solar Integration Study,** D. Lew (NREL, USA), R. Piwko, G. Jordan, N. Miller (GE Energy, USA), K. Clark (NREL, USA), L. Freeman (GE Energy, USA), M. Milligan (NREL, USA)
- **Managing Wind Penetrations of 50% and higher,** A. Rogers, J. O'Sullivan, P. Coughlan (EirGrid, Ireland), A. Kennedy (SONI, Ireland)
- **Limits to Integration of Renewable Energy Sources. The Spanish Experience and Challenges,** J. Revuelta (REE, Spain)
- **Voltage Stability Analysis of the Eastern Danish Power System with a High Share of Wind Energy,** N. Qin, V. Akhmatov, T. Lund, H. Abildgaard, M. K. Jørgensen (Energinet.dk, Denmark)

12:45 – 13:00 Discussions, discussion leader: Charles Smith (UWIG, USA)

11:25 – 13:00 Session 2b: Modeling – Part I

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

- **Overview, Status and Outline of the New IEC 61400 -27 - Electrical Simulation Models for Wind Power Generation,** P. Sørensen (Risø DTU, Denmark), B. Andresen (Siemens Wind Power, Denmark), J. Fortmann (REpower, Germany), K. Johansen (Energinet.dk, Denmark), P. Pourbeik (EPRI, USA)
- **Simplified Model of DFIG,** M. Mata Dumenjó, J. Sánchez Navarro, V. Casadevall Benet, J. Gil Cepeda, L. García Caballero (Alstom Wind, Spain)
- **Simplified Model of Wind Turbines with Doubly-Fed Induction Generator,** A. Timbus, P. Korba (ABB, Switzerland), A. Vilhunen, G. Pepe, S. Seman, J. Niiranen (ABB Oy, Finland)
- **Towards a Cross-Platform Binary Interface for Time-Domain Simulation Models,** R. Hendriks (Siemens, Germany/TU Delft, the Netherlands), J. Fortmann, M. Bley, L. Cai (REpower, Germany), O. Ruhle (Siemens, Germany), B. Kulicke (Ingenieurbüro Kulicke, Germany)

12:45 – 13:00 Discussions, discussion leader: Reigh Walling (GE Energy, USA)

11:25 – 13:00 Session 2c: Wind Forecasting

11:25 – 12:45 Presentations (16 minutes each):

- **Offshore Wind Power Prediction in Critical Weather Conditions,** N. Cutululis (Risø DTU, Denmark), N. Detlefsen (Energinet.dk, Denmark), P. Sørensen (Risø DTU, Denmark)
- **Increasing the Competition on Reserve for Balancing Wind Power with the help of Ensemble Forecasts,** J. U. Jørgensen, C. Möhrlen (WEPROG, Denmark)
- **An Overview of Wind Power Forecast Types and their Use in Large-scale Integration of Wind Power,** H. A. Nielsen, T. S. Nielsen (ENFOR, Denmark), H. Madsen (DTU, Denmark)
- **Future Wind Power Forecast Errors, Need for Regulating Power, and Costs in the Swedish System,** F. Carlsson (Vattenfall, Sweden)
- **The Distribution of Wind Power Forecast Errors from Operational Systems,** B.-M. Hodge, E. Ela, M. Milligan (NREL, USA)

12:45 – 13:00 Discussions, discussion leader: Hans-Peter Waldl (Overspeed, Germany)

13:00 – 14:00 Lunch

14:00 – 15:40 Session 3a: Country Studies – Part II

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

- **Wind Integration – A Survey of Global Views of Grid Operators** L. Jones (Alstom Grid, USA), C. Clark (US Department of Energy, USA)
- **Large Scale Renewable Energy Integration: Recent Experiences in the USA,** T. Gentile, D. J. Morrow, S. Mukherjee (Quanta Technology, USA), B. Kruimer (Quanta Technology, the Netherlands)
- **Wind Power Integration and Grid Code Issues in the Italian Power System,** G. Giannuzzi (Terna, Italy), O. Lamquet, S. Pasquini, M. Pozzi, F. Pretolani (CESI, Italy), C. Sabelli, C. Trenta, R. Zaottini (Terna, Italy)
- **Wind Curtailment Strategies and Applications in Wind Farms Cluster Areas** Y. Huang, C. Liu (China Electric Power Research Institute[CEPRI], China)

15:20 – 15:40 Discussions, discussion leader: Hannele Holttinen (VTT, Finland)

14:00 – 15:40 Session 3b: Testing and Validation

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

- **Wind Farm Simulation and Certification of its Grid Code Compliance - a Review of Lessons Learned from the German Experiences,** F. Kalverkamp, M. Meuser, B. Schowe-von der Brelie, J. Stüeken, (FGH, Germany)
- **Wind Power Plants Validation and Performance Tests - Hydro-Québec Experience,** M. Asmine, C. Bélanger (Hydro-Québec, Canada)
- **Experiences in Simulating and Testing Coordinated Voltage Control Provided by Multiple Wind Power Plants,** T. Arlabán (Acciona Windpower, Spain), J. Peiró (REE, Spain), O. Alonso (Acciona Windpower, Spain), R. Rivas (REE, Spain), D. Ortiz (Acciona Windpower, Spain), G. Quiñonez-Varela, P. Lorenzo (Acciona Energy, Spain)
- **Harmonic Generation and Mitigation by Full-Scale Converter Wind Turbines: Measurements and Simulations,** L. H. Kocewiak, J. Hjerrild (DONG Energy, Denmark), C. L. Bak (Aalborg University, Denmark)

15:20 – 15:40 Discussions, discussion leader: Eckehard Tröster (Energynautics, Germany)

14:00 – 15:40 Session 3c: HVDC

14:00 – 15:20 Presentations (16 minutes each):

- **Ancillary Services and Operation of Multi-terminal HVDC Systems,** Y. Phulpin (INESC Porto, Portugal), D. Ernst (University of Liège, Belgium)
- **Optimizing the Performance of VSC HVDC Control System,** M. C. Nguyen, K. Rudion, Z. A. Styczynski (Otto-von-Guericke-University Magdeburg, Germany)
- **LCC Based Multiterminal HVDC for Integration of Large Scale Wind Power,** X. Yang, C. Yue, D. Yao (ABB China, China)
- **Power Transmission and Large Scale Wind Farm Integration using Multi-Terminal DC Systems,** J. Rafferty, L. Xu (Queen's University Belfast, United Kingdom)
- **Standardization of VSC-HVdc Interface with Offshore Wind Generation,** E. Larsen (GE Energy, USA), G. Drobnjak (GE Energy, Germany), H. Elahi (GE Energy, USA)

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

15:40 – 16:20 Coffee break & Main Poster Session

16:20 – 18:30 Session 4a: Power System Balancing Part I

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

- **Variability of Load and Net Load in Case of Large Scale Distributed Wind Power ,** H. Holttinen, J. Kiviluoma (VTT, Finland), A. Estanqueiro (LNEG, Portugal), E. Gómez Lázaro (University Castilla-La Mancha, Spain), B. Rawn (TU Delft, the Netherlands), J. Dobschinski (Fraunhofer IWES, Germany), P. Meibom (Risø DTU, Denmark), E. Lannoye (University College Dublin, Ireland), T. Aigner (NTNU, Norway), Y.- H. Wan , M. Milligan (NREL, USA)
- **Controlling Imbalance Risk of Wind Power with a Dynamic Spinning Reserve Margin,** W. de Boer, M.Duvoort, G. Dekker (KEMA, the Netherlands)
- **Risk Coordination in the Computation of Operating Balancing Reserves for Wind Power Integration,** N. Menemenlis, M. Huneault (IREQ/Hydro-Québec, Canada), A. Robitaille (Hydro-Québec, Canada)
- **The Impact of Alternative Dispatch Intervals on Operating Reserve Requirements for Variable Generation,** M. Milligan, J. King, B. Kirby (NREL, USA), S. Beuning (Xcel Energy, USA)
- **Cross Border Renewable Energy Trade between Baja California and California,** M. A. Avila Rosales (CFE Mexico [retired], Mexico)

18:00 – 18:30 Discussions, discussion leader: Stephan Wachtel (GE Wind Energy, Germany)

16:20 – 18:50 Session 4b: Offshore Grid Connection – Part I

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

- **The First Three 800 MW Wind Park Grid Connection Projects with XLPE HVDC Cables,** D. Zhang, T. Lebioda, M. Koochack-Zadeh, J. Jung (TenneT Offshore, Germany)
- **400 MW Grid Connection to the Anholt Offshore Wind Farm in a Single 220 kV Cable System,** T. Kvarts (Energinet.dk, Denmark), M. Bailleul (General Cable, France), J. M. Domingo (General Cable, Spain), Y. Douima, F. Petitot (General Cable, France), A. Jensen , S. T. Salwin (nkt cables, Denmark)
- **Kriegers Flak - Challenges and Status of the first European "Two-in-One Project" ,** P. Jørgensen, M. Lervad Lundø (Energinet.dk, Denmark)
- **Conceptual Study of an Offshore Grid in the Norwegian Sector of the North Sea,** J. Hang, Ø. A. Rui, K. Karijord, M. E. Theisen (Statnett, Norway), B. Johansson (Solvina, Sweden), O. J. Bjerknes (Aker Solutions, Norway)
- **OffshoreGrid: Techno-Economic Model for Future Offshore Electricity Transmission,** P. Kreutzkamp, J. De Decker, N. Picot (3E, Belgium)
- **Testing Constraints and Opportunities for Offshore Renewable Energy: Strategic Development of Offshore Networks for Interconnection and Market Access ,** G. Bathurst (TNEI Sevices Ltd, United Kingdom), K. Bell (University of Strathclyde, United Kingdom)

18:20 – 18:50 Discussions, discussion leader: Søren Ranneries (DONG Energy, Denmark)

16:20 – 18:30 Session 4c: Modeling - Part II

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

- **Short Circuit Current Calculation for Wind Turbines with Doubly-Fed Induction Generator (DFIG) System: Problems and Solution Approaches,** V. Dinkhauser, L. Cai (REpower, Germany), S. Bolik (REpower UK, United Kingdom)
- **A Universal Methodology for Specification and Modeling of Wind Turbine Short-Circuit Current Contribution Characteristics,** R. Walling, E. Gursoy (GE Energy, USA)
- **A Study of Collector System Grounding Design with Type-4 Wind Turbines at the Le Plateau Wind Power Plant in Canada,** J.-N. Paquin (BBA, Canada), I. Jaskulski, J. Cassoli (Enercon, Germany), M. Fecteau (Hydro-Québec/TransÉnergie, Canada), C. Murray (Invenergy, USA)
- **Application of Real Time Digital Simulation in Modeling Wind Turbines with Reduced and Full Converter Schemes,** K. Protsenko, B. Badrzadeh (Vestas Technology, Denmark), P. F. Mayer (Vestas Technology, Singapore), Z. Luo (Vestas Americas, USA)
- **Real-Time Simulation of Wind Power Plants with VSC-HVDC Link for Network Integration Studies,** P. Le-Huy, O. Tremblay, R. Gagnon, P. Giroux (IREQ/Hydro-Québec, Canada)

18:00 – 18:30 Discussions, discussion leader: Ana Estanqueiro (LNEG, Portugal)

20:00 Workshop Dinner

Shuttle busses between 19:00 & 20:00 (to restaurant) and
23:00 & 00:00 (return to hotel)

Wednesday 26 October 2011

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

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

- **Operational Management of Intraday and Balancing Markets - a Survey,** J. Andersen (Aarhus University, Denmark), N. Detlefsen (Energinet.dk, Denmark)
- **Electricity Market Design Options and Balancing Rules in Offshore Grids,** S. T. Schröder (Risø DTU, Denmark), L. Sundahl (Energinet.dk, Denmark)
- **Frequency Control Ancillary Service Requirements with Wind Generation - Australian Projections,** J. Riesz, F.-S. Shiao, J. Gilmore, D. Yeowart, A. Turley, I. Rose (ROAM Consulting, Australia)
- **Are Integration Costs and Tariffs Based on Cost-Causation?,** M. Milligan, E. Ela, B.-M. Hodge (NREL, USA), B. Kirby (Consultant to NREL, USA), D. Lew (NREL, USA), C. Clark, J. DeCesaro, K. Lynn (US Department of Energy, USA)
- **Stationary and Dynamic Offshore Power System Operation Planning,** K. Rudion (Otto-von-Guericke University Magdeburg, Germany), A. Orths, H. Abildgaard, P. B. Eriksen, K. Søgaard (Energinet.dk, Denmark), M. Gurbiel (Otto-von-Guericke University Magdeburg, Germany), M. Powalko (Energinet.dk, Denmark), A. Styczynski (Otto-von-Guericke University Magdeburg, Germany)

10:10 – 10:40 Discussions, discussion leader: Jens Bömer (Ecofys, Germany)

08:30 – 10:40 Session 5b: Future High Penetration Aspects

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

- **Danish Fossil Independent Energy System 2050 - From Strategic Investigations to Intra-Hour Simulation of Balancing Issues,** A. B. Hansen, A. Orths, K. Falk, N. K. Detlefsen (Energinet.dk, Denmark)
- **Time to implement TSO 2.0,** J. Warichet, J.-J. Lambin (Elia, Belgium), O. Bronckart (Coreso, Belgium), C. Druet, W. Michiels (Elia, Belgium)
- **Transition to a Fully Renewable Power System in Europe,** G. B. Andresen (Aarhus University, Denmark), D. Heide (FIAS Johann Wolfgang Goethe University Frankfurt, Germany), M. G. Rasmussen, M. Greiner (Aarhus University, Denmark)
- **The Importance of Grid Expansion in a High Wind Penetration Scenario for Europe until 2050,** E. Tröster, L. Glotzbach, T. Ackermann (Energynautics, Germany), M. Fürsch, C. Jägemann, S. Nagl, S. Hagspiel, D. Lindenberger (EWI, Germany)
- **HVDC Grids for Continental-wide Power Balancing,** M. Callavik, J. Åhström (ABB Grid Systems, Sweden), C. Yuen (ABB Corporate Research, Switzerland)

10:10 – 10:40 Discussions, discussion leader: Alan Rogers (Eirgrid, Ireland)

08:30 – 10:40 Session 5c: Offshore Grid Connection - Part II

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

- **Validation of a Switching Operation in the External Grid of Gunfleet Sand Offshore Wind Farm by Means of EMT Simulations,** I. Arana, J. Okholm (DONG Energy Power, Denmark), J. Holbøll (DTU, Denmark)
- **Transient Studies in Large Offshore Wind Farms, Taking Into Account Network/Circuit Breaker Interaction,** J. Glasdam (DONG Energy, Denmark), C. L. Bak (Aalborg University, Denmark), J. Hjerrild, I. Arana (DONG Energy, Denmark)
- **Overvoltages During Energisation of an Offshore Wind Farm,** F. Moore (Cardiff University, United Kingdom), R. King (Alstom Grid, United Kingdom), A. Haddad, H. Griffiths (Cardiff University, United Kingdom), M. Osborne (National Grid, United Kingdom), N. Jenkins (Cardiff University, United Kingdom)
- **Voltage Control in Offshore Wind Farms Using Switched Compensation Elements (MSCs, MSRs) Together with the Reactive Power Capability of the Wind Turbine Generators,** A. Handschick, A. J. Hernandez, F. Schettler, B. Strobl (Siemens, Germany)
- **Power-Hardware-In-the-Loop Test of VSC-HVDC Connection for Off-shore Wind Power Plants,** R. Sharma (Siemens Wind Power, Denmark), S. T. Cha, Q. Wu, T. W. Rasmussen (DTU, Denmark), K. H. Jensen (Siemens Wind Power, Denmark), J. Østergaard (DTU, Denmark)

10:10 – 10:40 Discussions, discussion leader: Ralph Hendriks (Siemens, Germany/TU Delft, the Netherlands)

10:40 – 11:00 Coffee break

11:00 – 13:00 Session 6a: Smart Grid and Wind Power – Part I

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

- **The Role of Wind Turbines in Smart Distribution Systems,** P. Lund (Energinet.dk, Denmark), N. Martensen, T. Ackermann (Energynautics, Germany), J. Harrell (Spirae, USA)
- **Potential of the Flexibility of Heat Pump Operation for Wind Power Integration,** G. Papaefthymiou, B. Hasche, C. Nabe (Ecofys, Germany)
- **Using Dynamic Line Rating to minimize Curtailment of Wind Power Connected to Rural Power Networks,** P. Schell (Ampacimon, Belgium), J.-J. Lambin (Elia, Belgium), B. Godard, H.-M. Nguyen, J.-L. Lilien (University of Liège, Belgium)
- **Optimizing the Performance of Renewable Sources Using Virtual Renewable Power Plants,** L. Rodrigues, A. Estanqueiro (LNEG, Portugal)
-

12:40 – 13:00 Discussions, discussion leader: Poul Sørensen (Risø DTU, Denmark)

11:00 – 13:00 Session 6b: Modeling III

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

- **Loss of (Angle) Stability of Wind Power Plants - The Underestimated Phenomenon in Case of Very Low Short Circuit Ratio,** V. Diedrichs (Jade Hochschule, Germany), A. Beekmann, S. Adloff (Enercon, Germany)
- **On Impact of Voltage Control Characteristics of Wind Power Plants on Damping of Electromechanical Oscillations,** T. Rauhala, A.-J. Nikkilä (Fingrid Oyj, Finland)
- **Improving the Methodology to Model Reservoir Hydro Power in a Unit Commitment Model Using Simplified RiverSystem Constraints,** E. Rinne, J. Kiviluoma (VTT, Finland)
- **Simulation of Offshore Wind Farm Integrated into Power Grid Using VSC HVDC System,** H. Guo, C. M. Nguyen, K. Rudion, Z. A. Styczynski (Otto-von-Guericke-University Magdeburg, Germany)

12:20 – 13:00 Discussions, discussion leader: Jens Fortmann (Repower, Germany)

11:00 – 13:00 Session 6c: Offshore Grid Connection - Part III

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

- **Experience with Connecting Five UK Round 2 Offshore Wind Farms to the Grid,** P. Glaubitz (Siemens, Germany), J. Finn, A. Shafiu (Siemens UK, United Kingdom)
- **Risk Based Approach for Offshore Grid Development,** T. Langeland, C. Greiner (Det Norske Veritas, Norway), C. Öhlen (STRI, Sweden)
- **Dynamics and Control of Multi-terminal HVDC Systems for Off-shore Wind Farm Integration,** E. Ciapessoni, D. Cirio, A. Gatti, A. Pitto (RSE, Italy)
- **Application of Over-current Relay in Offshore Wind Power Plant Grid with VSC-HVDC Connection,** S. K Chaudhary, R. Teodorescu (Aalborg University, Denmark), P. Rodriguez (TU of Catalonia, Spain), P. C. Kjær (Vestas Technology, Denmark)
- **Determination of Hotspots in Submarine Power Cables in Offshore Wind Farms using Distributed Temperature Sensing Technology,** S. V. Kjær, D. Schwartzberg, W. Christiansen, M. Z. Zinglersen (DONG Energy, Denmark)

12:40 – 13:00 Discussions, discussion leader: Lawrence E. Jones (Alstom Grid, USA)

13:00 – 14:00 Lunch

14:00 – 15:40 Session 7a: Frequency Control and Inertia

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

- **Inertia for Wind Power Plants – State of the Art Review Year 2011,** P. W. Christensen, G. T. Tarnowski (Vestas, Denmark)
- **Frequency Activated Fast Power Reserve for Wind Power Plant Delivered from Stored Kinetic Energy in the Wind Turbine Inertia,** T. Knüppel, P. Thuring, S. Kumar, M. N. Kragelund, R. Nielsen, K. André (Siemens Wind Power, Denmark)
- **Provision of Frequency Control by Wind Farms,** M. Speckmann, A. Baier (Fraunhofer IWES, Germany)
- **The Effects of Different Regulation Strategies on Jiangsu's Wind Integration,** L. Hong, H. Lund, B. Möller, C. Wang (Aalborg University, Denmark)
-

15:20 – 15:40 Discussions, discussion leader: Eckard Quitmann (Enercon, Germany)

14:00 – 15:40 Session 7b: Smart Grid and Wind Power – Part II

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

- **Need of Harmonised Generic Model Standards for Flexible Grids in a Smart Future,** T. Gehlhaar, T. Wehrend (Germanischer Lloyd, Germany), H. Langkowski, D. Schulz (Helmut Schmidt University Hamburg, Germany)
- **Flexible Plug and Play Low Carbon Networks - Enabling the Connection of Wind Generation,** C. Marantes, S. Georgiopoulos, G. Manhangwe, D. Openshaw (UK Power Networks, United Kingdom)
- **Decrease of Wind Power Balancing Costs Due to Smart Charging of Electric Vehicles,** J. Kiviluoma (VTT, Finland), P. Meibom (Risø DTU, Denmark)
- **Raising the Accommodation Ceiling for Wind Power by Intelligent Response of Demand and Distributed Generation,** P. MacDougall (TNO, the Netherlands), C. Warmer (ECN, the Netherlands), K. Kok (TNO, the Netherlands)

15:20 – 15:40 Discussions, discussion leader: Bri-Mathias Hodge (NREL, USA)

14:00 – 15:40 Session 7c: Wind Power Plant Aspects

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

- **Power Quality Monitoring Guideline for Wind Farms connected to Extra High Voltage Grids,** S. Rabe, K. Rudion, Z. Styczynski (University of Magdeburg, Germany), Y. Sassnick, M. Wilhelm (50Hertz Transmission, Germany)
- **Network Fault Response of Transmission Systems with Active Distribution Systems during Reverse Power Flows,** J. C. Boemer (TU Delft, the Netherlands/Ecofys, Germany), A. van der Meer, B. G. Rawn (TU Delft, the Netherlands), R. L. Hendriks (TU Delft, the Netherlands/Siemens, Germany), M. Gibescu (TU Delft, the Netherlands), M. van der Meijden (TU Delft/TenneT TSO, the Netherlands), W. Kling (TU Eindhoven, the Netherlands), J. A. Ferreira (TU Delft, the Netherlands)
- **Land Cable Systems for the Connection of Wind Farms,** H. Brakelmann, J. Brüggmann (University of Duisburg-Essen, Germany), W. Frisch (IFK, Austria)
- **Mitigation of Grid Frequency Excursions at Hourly Transitions by Wind Power,** J. E. S. de Haan, J. Frunt, W. L. Kling (Eindhoven University of Technology, the Netherlands)

15:20 – 15:40 Discussions, discussion leader: Michael Nørtoft Frydensbjerg (Siemens Wind Power, Denmark)

15:40 – 16:10 Coffee break & Poster Session

16:10 – 17:15 Session 8: Closing Session – Panel Discussions

16:00 – 16:10 Topic: **North Seas Grid and Pan-European Electricity Highways - Fiction, Vision or Strategy?**

16:10 – 17:00 Podium discussions:

Jan de Decker (3E, Belgium)

Eckehard Tröster (energynautics, Germany)

Corinna Möhrlen (WEPROG, Denmark)

Michael Milligan (NREL, USA)

Hannele Holttinen (VTT, Finland)

Krzysztof Rudion (Otto-von-Guericke-University Magdeburg, Germany)

Magnus Callavik (ABB Grid Systems, Sweden)

Discussion leader: Antje Orths (Energinet.dk, Denmark)

17:00 – 17:05 Closing remarks

POSTERS

Simulated Switching Transients in the External Grid of Walney Offshore Wind Farm, I. Arana, D. Johnsen, T. Sørensen (DONG Energy Power, Denmark), J. Holbøll (DTU, Denmark)

Can Weather Radars Help Monitoring and Forecasting Wind Power Fluctuations at Offshore Wind Farms?, P.-J. Trombe, P. Pinson, H. Madsen (DTU Informatics, Denmark), N. E. Jensen, L. Birch Pedersen (DHI Weather Radar Systems, Denmark), A. Sömmer (Vattenfall, Denmark), N. F. Le (DONG Energy, Denmark)

Grid Frequency Responses of Wind Power Variability and Predictability, J. E. S. de Haan, J. Frunt, W. L. Kling (Eindhoven University of Technology, the Netherlands)

The effect of Wind Integration on Economic Dispatch and CO2 Emissions in a Closed Operated Dutch Power System, A.G.Q. de Jong, J.E.S.de Haan, J. Frunt (Eindhoven University of Technology, the Netherlands), E. Pelgrum (Tennet TSO,the Netherlands), W.L. Kling (Eindhoven University of Technology, the Netherlands)

Large-Scale Integration of Wind Power in Integrated Assessment Models, O. Balyk, K. Karlsson (Risø DTU, Denmark)

Advanced Extreme and Ramp Event Forecasting and Alarming to Support Stability of Energy Grids, H.-P. Waldl, P. Brandt (Overspeed, Germany)

A Study of Offshore Wind HVDC System Stability and Control, H. Liu, J. Sun (Rensselaer Polytechnic Institute, USA)

Impedance Modeling and Control of Grid-Parallel Inverters, M. Cespedes, J. Sun (Rensselaer Polytechnic Institute, USA)

TWENTIES Project: Wind Power for Wide-area Control of the Grid, J. C. Pérez, C. Combarros (Iberdrola Renovables, Spain), D. Rubio (Iberdrola Ingeniería y Construcción, Spain), R. Veguillas, M. J. Hermosa (Iberdrola Renovables, Spain), I. Egido (IIT Comillas University, Spain)

Possibilities of Applying Wind Farms Oversizing to Increasing Wind Energy Production in a System with Limited Transmission Capacity, M. Bajor, R. Jankowski (Institute of Power Engineering Gdansk, Poland)

Improving Real-Time Thermal Ratings Using Computational Wind Simulations, D. Greenwood, G. Ingram, P. Taylor (Durham University United Kingdom), D. Kadar (Scottish Power Energy Networks, United Kingdom), A. Tewkesbury (Astrium Geo-Information Services, United Kingdom)

Wind Power Production Variations in the Swedish Power System, F. Carlsson (Vattenfall R&D, Sweden)

Case Study of Coordinated Voltage Control and Network Losses in an Existing Medium Voltage Network with Large Penetration of Wind Power, I. Leisse, O. Samuelsson, J. Svensson (Lund University, Sweden)

A Comprehensive Approach to Consider Renewable Energy Integration in the Planning Process of Large Power Systems, G. Callegari, D. Canever, D. Provenzano, A. Prudenzi (CESI, Italy)

Control System Structure of Multi-terminal VSC-HVDC Transmission System, E. Karatsivos, J. Svensson, O. Samuelsson (IEA Lund University, Sweden)

Rate of Change of Frequency and Frequency Deviation in the Nordic Power System with Increasing Wind Power, J. Björnstedt, O. Samuelsson (Lund University, Sweden)

Wind Farms' Influence on Stability in an Area with High Concentration of Hydropower Plants, S. Engström, J. Persson, P. Olsson (Vattenfall R&D, Sweden), U. Lundin (Uppsala University, Sweden)

Environmental Severity Classes for Main Electrical Components in Offshore Wind Turbines, M. Henriksen (DTU, Denmark), E. Koldby (ABB, Denmark), J. Holbøll A. Holdyk(DTU, Denmark)

Compatibility Between Electric Components in Wind Farms, A. Holdyk, J. Holboell (DTU, Denmark), I. Arana (DONG Energy, Denmark)

Maximizing Wind Power Integration in Distribution System, S. Nursebo Salih, P. Chen, O. Carlson (Chalmers University of Technology, Sweden)

The Impact of High Wind Power Penetration on Hydroelectric Unit Operations, B.-M. Hodge, D. Lew, M. Milligan (NREL, USA)

Evaluating the Synergies of Renewable Generation and PHEVs, E. Ibanez (NREL, USA), D. Lew, M. Milligan (NREL, USA), G. Jordan, R. Piwko (GE Energy, USA)

The Value of Wind Forecasting, D. Lew (NREL, USA), G. Jordan(Consultant, USA), R. Piwko (GE Energy, USA), M. Milligan (NREL, USA)

New Algorithm for Islanding Detection of Wind Turbines Driven DFIG, J. Mirzaei (Monenco Consulting Engineering, Iran), H. Kazemi Kargar (Shahid Beheshti University, Iran)

Electrolysis for Integration of Renewable Electricity and Routes towards Sustainable Fuels, M. Mogensen, F. Allebrod, J. R. Bowen, C. Chatzichristodoulou, M. Chen, S. D. Ebbesen, C. Graves, J. Hallinder, A. Hauch, P.V. Hendriksen, P. Holtappels, J. V. T. Høgh, S. H. Jensen, A. Lapina, P.L. Mollerup, X. Sun (Risø DTU, Denmark)

Day Ahead Forecast of Wind Power through optimal Application of Multivariate Analyzing Methods, A. Arnoldt, P. Bretschneider (Fraunhofer IOSB-AST, Germany)

Development of a Flexible Measurement System for Offshore Wind Farm Applications, L. Kocewiak, I. Arana, J. Hjerrild, T. Sørensen (DONG Energy, Denmark), C. L. Bak (Aalborg University, Denmark), J. Holbøll (DTU, Denmark)

Topology and Technology Survey on Medium Voltage Power Converters for Large Wind Turbines, M. Sztykiel, R. Teodorescu, S. Munk-Nielsen (Aalborg University, Denmark), P. Rodriguez (Technical University of Catalonia, Spain), L. Helle (Vestas Wind Systems, Denmark), C. Busca (Aalborg University, Denmark)

Analysis of the Statistics of Wind Power Gradients at Off-shore and On-shore Wind Installations, H. G. Beyer (University of Agder, Norway)

Market and Wind Integration in the North and Baltic Seas - Potential for Merchant Transmission Investment, J. Egerer (University of Technology Berlin, Germany), F. Kunz (University of Technology Dresden, Germany)

Press-pack IGBTs: a Reliable Solution for Medium Voltage Multi-Megawatt Wind Turbine Power Converters, C. Busca, R. Teodorescu, F. Blaabjerg, S. Munk-Nielsen (Aalborg University, Denmark), P. Rodriguez (Technical University of Catalonia, Spain), L. Helle, T. Abeyasekera (Vestas Wind Systems, Denmark), M. Sztykiel (Aalborg University, Denmark)

Grid-Connection of Offshore Wind Farms Using VSC-HVDC Systems, X. Fu, L.-A. Dessaint (École de Technologie Supérieure, Canada), R. Gagnon (IREQ/Hydro-Québec, Canada)

Optimal Combination of Storage and Balancing in a 100% Renewable European Power System, M. G. Rasmussen, G. B. Andresen (Aarhus University, Denmark), D. Heide (FIAS Frankfurt University, Germany), M. Greiner (Aarhus University, Denmark)

Wind Farm Operation Planning Using Optimal Pitch Angle Pattern (OPAP), N. Moskalenko, K. Rudion (Otto-von-Guericke University Magdeburg, Germany)

Li-Ion Batteries in a Virtual Power Plant (Energy Storage + Wind Power Plant) for Primary Frequency Regulation, P. Braun, M. Swierczynski, F. Blaabjerg (Aalborg University, Denmark), P. Rodriguez (Technical University of Catalonia, Spain) R. Teodorescu (Aalborg University, Denmark)

Dampening Variation in the Northern European Wind Energy Output – Influence of Geographical Location, L. Reichenberg, F. Johnsson, M. Odenberger (Chalmers University of Technology, Sweden)

Probabilistic Aspects of Harmonic Emission of Large Offshore Wind Farms, C. F. Jensen (Energinet.dk, Denmark), C. L. Bak (Aalborg University, Denmark), J. Hjerrild, L. Kocewiak (Dong Energy, Denmark), K. K. Berthelsen (Aalborg University, Denmark)

Integration of Large Scale Wind Power, Troels Davidsen (Inopower,)

Harmonic Analysis Experience from a Wind Farm Substation Project in Sweden, C. Yu, N. Ullah, J. Höglund, G. Pinares (STRI, Sweden), N. Willemsen, M. Holmberg (ABB, Sweden)

	Energinet.dk Day
08:30 - 08:50	Keynote: **The Danish case –** **Vision and strategy for the power system towards a fossil independent energy supply** (Dorthe Vinther, Vice President)
08:50 - 10:55	**Transmission** Moderator: Antje Orths
	• Facilitating the Big and Beautiful Grid 2030 the Danish TSO's solutions for both, optimal expansion and cabling of the HV grid - gathered in the DANPAC project: optimal efficiency / components / structure (Per Balle Holst, Unnur Stella Gudmundsdottir)
	• Two innovative Offshore Projects: - the Offshore-Grid-Prototype-Project (Kriegers Flak) - Innovative solutions for the Anholt Park (Sven Erling Rye, Jens C. Hygebjerg, Thomas Kvarts)
	• Vernissage on Transmission including discussions with presenters and coffee
10:55 - 12:45	**Flexibility** Moderator: Anders Bavnhøj Hansen
	• Optimal Market Design for Efficient Balancing of Renewables – New Way of Thinking (Lasse Sundahl)
	• Value for Money: Optimal Trade of Regulating Power leading to efficient system operation (Gitte Agersbæk)
	• Benefits of new Pan-European Wind Time Series - Improving Grid Planning Issues. (Nina Detlefsen)
	• Modelling Wind Power in Simulations of Security of Supply (Geir Brønmo)
	• Panel Discussion with presenters
12:45 - 13:45	**Lunch**
13:45 - 15:30	**Smart Grid** Moderator: Jeannette Møller Jørgensen
	• The Danish Smart Grid concept for controlling a 50 % RES power system (Carsten Strunge)
	• Cell Controller Pilot Project - Intelligent Mobilization of Distributed Power Generation (Per Lund)
	• EcoGrid EU – Real time pricing in practice (Preben Nyeng)
15:30 - 15:45	**Summary of the Day** (Antje Orths)