

7th International Workshop

on Large-Scale Integration
of Wind Power into Power Systems

as well as on

Transmission Networks
for Offshore Wind Farms

26-27 May 2008, Madrid, Spain

The Seventh Workshop is organized by:



The Seventh Workshop is sponsored by:



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Sunday 25	Monday 26	Tuesday 27	Wednesday 28		
	8:00 - 9:00 Entrance Hall Registration				
	9:00 – 11:00 Room Zaragoza	9:00-10:40			
	Welcome and Session 1 Keynote Session	Room Burgos/León Session 5a Market Integration of Wind Power	Room Salamanca/Ávila Session 5b Forecasting and Operation Issues		
	11:00 – 11:25 Coffee Break	Room Zaragoza Session 5c Grid Code Issues I	9:15 - 18:00		
	11:25 – 13:00	10:40 – 11:00 Coffee Break	<p>Field Trip</p> <p>i) Control Centre of REE - Red Eléctrica (CECOEL)</p> <p>ii) Villacañas wind farm</p> <p>iii) Operation Centre for Renewable Energies - CORE of Iberdrola in Toledo</p> <p>The busses for the Field Trip will be leaving from the Hotel Meliá Avenida América at 09:00 a.m.</p>		
Room Zaragoza Session 2a Grid Integration	Room Burgos/León Session 2b Wind Forecasting	11:00 – 13:00			
		Room Zaragoza Session 6a Modeling and DC Solutions		Room Burgos/León Session 6b Cabling Issues	Room Salamanca/Ávila Session 6c Islanding Projects
13:00 – 14:00 Lunch		13:00 – 14:00 Lunch			
14:00 – 15:40		14:00 – 15:40			
Room Burgos/León Session 3a Modeling and Wind Farm Control	Room Zaragoza Session 3b Offshore Wind Farms and Turbine Concepts	Room Salamanca/Ávila Session 3c Power System Planning & Operation		Room Zaragoza Session 7a Grid Code Issues II	Room Burgos/León Session 7b Advanced Solutions for Balancing
15:40 – 16:00 Coffee Break		15:40 – 16:00 Coffee Break			
16:00 – 18:00		16:00 – 16:45			
Room Zaragoza Session 4a Grid Integration Studies	Room Burgos/León Session 4b Power System Balancing Issues	Room Salamanca/Ávila Session 4c Offshore Wind Farm Grid Integration Issues		Room Zaragoza Session 8 Closing Session – Podium discussions	
18:00 - 20:00 Conference Hotel/Room Zaragoza Reception, Registration & Snack	20:00 Real Madrid-Bernabeu Stadium Shuttle Service between Hotel and Stadium and back 19.00-20.00 and 23.00-00.00 Workshop Dinner				

Monday 26 May 2008

- 08:00 – 09:00 Registration (Entrance Hall)
- 09:00 – 09:20 Opening (Room Zaragoza I + II)
- 09:00 – 09:05 Welcome and introduction, Thomas Ackermann
 - 09:05 – 09:15 Welcome from AEE
 - 09:15 – 09:20 Structure of the workshop
- 09:20 – 11:00 Session 1: Keynote session (Room Zaragoza I + II)
- 09:20 – 10:40 Presentations (20 minutes each):
 - **The Spanish experience in the integration of the electricity from wind power plants into the electrical system**, Alberto Ceña Lázaro, Jesús Gimeno Sarciada (AEE – Spanish Wind Energy Association, Spain) **Paper_126**
 - **Operation of a power system with large integration of renewable energies**, Miguel de la Torre, T. Dominguez, G. Juberías, E. Prieto, O. Alonso (REE, Spain) **Paper_127**
 - **Impacts of large amounts of wind power on design and operation of power systems, results of IEA collaboration**, Hannele Holttinen (VTT Technical Research Centre of Finland, Finland), P. Meibom (Risø National Laboratory, Denmark), Antje Orths (Energinet.dk, Denmark), M. O'Malley (University College Dublin, Ireland), Bart C. Ummels (Delft University of Technology, the Netherlands), J.O. Tande (SINTEF, Norway), Ana Estanqueiro (INETI, Portugal), E. Gomez (University Castilla La Mancha, Spain), J.C. Smith (UWIG, USA), E. Ela (NREL, USA) **Paper_55**
 - **The challenges and solutions of increasing from 20 to 50 percent of wind energy coverage in the Danish power system until 2025**, Peter Børre Eriksen, Antje Orths (Energinet.dk, Denmark) **Paper_128**
 - 10:40 – 11:00 Discussions, discussion leader: Alberto Ceña (AEE, Spain)
- 11:00 – 11:25 Coffee break (Room Zaragoza III, 4th floor)
- 11:25 – 13:00 Session 2a: **Grid Integration Experience and Possibilities** (Room Zaragoza I + II)
- 11:25 – 12:45 Presentations (20 minutes each):
 - **Wind Farms can Provide Frequency Response – Experience of the Great Britain Transmission System Operator**, Jonathan Horne (Nationalgrid, UK), **Paper_38**
 - **Wind Energy Converters with FACTS Capabilities and the Benefits for the Integration of Wind Power into Power Systems**, Stephan Wachtel, Jeferson Marques, Eckard Quitman, Martin Schellschmidt (ENERCON, Germany), **Paper_89**
 - **Impact of TradeWind Offshore Wind Power Capacity Scenarios on Power Flows in the European HV Network**, Frans Van Hulle (EWEA - European Wind Energy Association, Belgium), **Paper_83**
 - **The Ability of Current U.S. Electric Industry Structure and Transmission Rules to Accommodate High Wind Energy Penetration**, Rob Gramlich, Michael Goggin (American Wind Energy Association, USA), **Paper_31**
 - 12:45 – 13:00 Discussions, discussion leader: Charles Smith (UWIG, USA)

- 11:25 – 13:00 **Session 2b: Wind Forecasting (Room Burgos/León)**
- 11:25 – 12:45 Presentations (20 minutes each):
- **Short-term Forecasting of Wind Power in Italy - The GSE Experience**, G. Niglio, G. Scorsoni (GSE, Italy). **Paper_61**
 - **Forecasting For Utility-Scale Wind Farms, The Power Model Challenge**, Jeremy Parkes (Garrad Hassan, U.K.) **Paper_36**
 - **Integration of Highly Localized Wind Power Predictions into the Management of Regional Grids**, Matthias Lange, Ulrich Focken, Miriam Wolff (energy & meteo systems, Germany), Frank Berster (RWE Transportnetz Strom, Germany), Christian Scholz, (Vattenfall Europe Transmission, Germany), **Paper_84**
 - **Uncertainty on Predicted Cross Border Flows Caused by Wind Forecast Errors**, Nicolaos Antonio Cutululis, Poul Sørensen, G. Giebel (Risø DTU, Denmark), M. Korpås, L. Warland (SINTEF Energy Research, Norway), **Paper_74**
- 12:45 – 13:00 Discussions, discussion leader: Bart Ummels (Delft University of Technology, the Netherlands),
- 13:00 – 14:00 Lunch (Room Toledo III + IV, 3rd floor)
- 14:00 – 15:20 **Session 3a: Modeling and Wind Farm Control Room (Room Burgos/León)**
- 14:00 – 15:00 Presentations (20 minutes each):
- **Wind Turbine Low Voltage Ride Through Modeling and Analysis in the Brazilian High Voltage Network**, Silvio Luiz Ferreira, A. S. Neto, R. F. Dias, J. P. Arruda, P. A. C. Rosas, F. A. S. Neves, S. R. Silva, F. C. Medeiros (Federal University of Pernambuco - UFPE, Brazil, **Paper_79**
 - **Phase-angle Jump During Voltage Dips in Wind Power Installations**, Emilio Gómez Lázaro, J. A. Fuentes, A. Molina-García (Universidad Politécnica de Cartagena, Spain), M. Cañas, A.J. Pujante (Universidad de Castilla-La Mancha) **Paper_119**
 - **Reactive Power Management and Voltage Control with the Wind Farm Cluster Management System**, César Augusto Quintero Marrone, Alejandro J. Gesino, Bernhard Lange, Kurt Rohrig, Reinhard Mackensen, Martin Wolff (ISET, Germany) **Paper_88**
- 15:00 – 15:20 Discussions, discussion leader: Markus Pöller (DigSilent, Germany)
- 14:00 – 15:40 **Session 3b: Offshore Wind Farms and Turbine Concepts (Room Zaragoza)**
- 14:00 – 15:20 Presentations (20 minutes each):
- **Practical Experiences gained at Lillgrund Offshore Wind Farm**, Åke Larsson, (Vattenfall Power Consultants, Sweden), **Paper_18**
 - **Experience Gained by a major Transformer Failure at the Offshore Platform of the Nysted Offshore Wind Farm**, Niels Andersen, J.H. Marcussen, E. Jacobsen, S.B. Nielsen (SEAS-NVE, Denmark), **Paper_66**
 - **Long-term Concept for an Offshore Power Transmission System in the German North Sea**, Boris Valov, Bernhard Lange, Kurt Rohrig (ISET, Germany), S. Heier (Universität Kassel, Germany), **Paper_23**
 - **Constant Speed Turbines on a Grid with Variable Frequency – A Comparison in Terms of Energy Capture**, Eckehardt Troester (energynautics, Germany), **Paper_101**
- 15:20 – 15:40 Discussions, discussion leader: Nicholas W. Miller (GE Energy, USA)

14:00 – 15:40 **Session 3c: Power System Planning & Operation**
(Room Salamanca/Ávila)

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

- **On the Coordination of Wind and Hydro Power**, Julija Matevosyan (Royal Institute of Technology, Sweden), **Paper_22**
- **Wind Power and Transmission Grid Planning**, Jussi Matilainen (Fingrid, Finland), L.C. Haarla (Helsinki University of Technology, Finland) **Paper_28**
- **Assessment of Network Limits with High Wind Penetration**, Thomas Boehme (Det Norske Veritas, U.K.), Gareth P. Harrison, Robin Wallace (University of Edinburgh, UK), **Paper_80**
- **Advanced Requirements for Thermal Power Plants for System Stability in Case of High Wind Power Infeed**, István Erlich (University of Duisburg-Essen, Germany), Jakob Löwen, Jörg Michael Schmidt, Wilhelm Winter (E.ON Netz, Germany) **Paper_99**

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

15:40 – 16:00 Coffee break (Hall and/or Room Zaragoza III)

16:00 – 18:00 **Session 4a: Grid Integration Studies** (Room Zaragoza)

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

- **Impact of High Levels of Wind and other Variable Renewable Generation on the Operation of the California Grid**, Nicholas W. Miller, Richard J. Piwko, Kara Clark, Gary A. Jordan (GE Energy, USA), David Hawkins, (California ISO, USA), **Paper_32**
- **Mix of power system flexibility means providing 50 % wind power penetration in the Danish power system in 2030**, Per Nørgaard (Risø DTU, Denmark), H. Lund, B.V. Mathiesen (Aalborg University, Denmark) **Paper_21**
- **The Irish "All Island Grid Study" - Methodology and Results**, Christian A. Nabe, Karsten Burges (Ecofys, Germany) **Paper_40**
- **Large-scale Integration of Wind Power into Power Systems-Case Study from India**, K. Balaraman (Power Research Development Consultants, India), B.L. Lakshmikanth (Bangalore Institute of Technology, India), Rakesh Hedge, R.Nagaraja (Power Research Development Consultants, India) **Paper_48**
- **Approach and Methodologies for Conducting Large-Scale Wind Integration Studies in the U.S.**, Dave Corbus, Debbie Lew (National Renewable Energy Laboratory NREL, USA), **Paper_115**

17:40 – 18:00 Discussions, discussion leader: Antje Orths (Energinet.dk, Denmark)

16:00 – 18:00 **Session 4b: Power System Balancing Issues**
(Room Burgos/León)

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

- **Impact of Wind Power on the Power System Imbalances in Finland**, Aleksi Helander (TKK Helsinki University of Technology, Finland, Hannele Holttinen (VTT, Finland), Jukka Paatero (TKK Helsinki University of Technology, Finland), **Paper_54**
- **Coordinated Multi-Objective Control of Regulating Resources in Multi-Area Power Systems with Large Penetration of Wind Power Generation**, Preben Nyeng (Technical University of Denmark, Denmark), Bo Yang, Jian Ma, Yuri Makarov (Pacific Northwest National Laboratory, USA), John H. Pease (Bonneville Power Administration, USA), David Hawkins, Clyde Loutan (California ISO, USA), **Paper_53**
- **Impact of Wind Generation Fluctuations in the Design and Operation of Power Systems**, Ana Estanqueiro (INETI, Portugal), **Paper_85**
- **Requirements for the Participation in Power Markets in Belgium**, Paula Souto Pérez, Johan Driesen, Ronnie Belmans (ESAT/ELECTA K.U. Leuven, Belgium) **Paper_9**
- **Facilitating high wind penetrations within the Australian National Electricity Market – renewable support policies and market design issues and opportunities**, I. F. MacGill, H. R. Outhred (University of New South Wales in Sydney, Australia) **Paper_122**

17:40 – 18:00 Discussions, discussion leader: Wil L. Kling (Tennet, the Netherlands)

16:00 – 17:40 **Session 4c: Offshore Wind Farm Grid Integration Issues**
(Room Salamanca/Ávila)

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

- **Higher Frequency Performance of AC Cable Connections of Offshore Wind Farms - Studies of the Danish TSO**, Wojciech Wiechowski, J. C. Hygebjerg, Peter Børre Eriksen (Energinet.dk, Denmark), **Paper_67**
- **Dynamic Behavior of Offshore Wind Farms with AC Grid Connection**, István Erlich (University of Duisburg-Essen, Germany), Siew Bopp (E.ON Netz Offshore, Germany), Wilhelm Winter (E.ON Netz, Germany), **Paper_30**
- **Switching Transients in Large Offshore Wind Farms**
Rose King, Nick Jenkins (Cardiff University, United Kingdom) (**Poster_45**)
- **Reduction of Wind Power Variability by Aggregation of Wind Farms to Large Interconnected Offshore Grids**, Doron Callies, Arne Wessel, Yves-Marie Saint-Drenan, Bernhard Lange (ISET, Germany), **Paper_69**

17:20 – 17:40 Discussions, discussion leader: Thomas Ackermann (energynautics, Germany)

20:00 Conference Dinner - Real Madrid-Bernabeu Stadium

Tuesday 27 May 2008

09:00 – 10:40 Session 5a: **Market Integration of Wind Power** (Room Burgos/León)

09:00 – 10:20 Presentations (20 minutes each):

- **System Balancing with 6 GW Offshore Wind Energy in the Netherlands - Instruments for Balance Control**, Madeleine Gibescu (Delft University of Technology, the Netherlands), A.J. Brand (Energy Research Center of the Netherlands ECN, the Netherlands), Wouter W. de Boer (KEMA Consulting, the Netherlands), **Paper_49**
- **Integration of Large Amounts of Wind Power – Markets for Trading Imbalances**, Viktoria Neimane (Vattenfall Research and Development, Sweden), Johan Gustafsson (Vattenfall Nordic Generation Management, Sweden), Urban Axelsson (Vattenfall Research and Development, Sweden), Kristian Gustafsson (Vattenfall Nordic Generation Management, Sweden), Robin Murray (Vattenfall Vinkraft AB, Sweden), **Paper_59**
- **The Role of Market Participation for a Better System Integration of Wind Energy**, Juan Rivier Abbad (IBERDROLA Renovables, Spain), **Paper_120**;
- **Grid Connection Rules for Wind Farms in Spain, Germany, Portugal, UK and Sweden**, Thomas Ackermann (Energynautics, Germany), Eva Centeno Lopez (Energimyndigheten, Sweden), Lennart Söder (Royal Institute of Technology, Sweden) **Paper_102**

10:20 – 10:40 Discussions, discussion leader: Julija Matevosyan (Royal Institute of Technology - KTH, Sweden)

09:00 – 10:40 Session 5b: **Forecasting and Operation Issues** (Room Salamanca/Ávila)

09:00 – 10:20 Presentations (20 minutes each):

- **The Character of Wind Power Variability and its Effects on Fill-In Power**, Jay Apt, Warren Katzenstein (Carnegie Mellon University, USA) (**Paper_11**)
- **On-line Functions for Security Operation of Interconnected Systems having Large Wind Power Production**, Helena Vasconcelos, J. A. Peças Lopes (Porto University, Portugal), **Paper_64**
- **Creating the Dataset for the Western Wind and Solar Integration Study (U.S.A.)**, Cameron W. Potter (3TIER, USA), Debra Lew (NREL;USA), Jim McCaa, Sam Cheng, Scott Eichelberger and Eric Gritmit (3TIER, USA), **Paper_58**
- **Artificial Neural Network Based Wind Power Forecasting Using a Multi-Model Approach**, Ümit Cali, Bernhard Lange, Jan Dobschinski, Melih Kurt (ISET e.V., Germany), Corinna Möhrlein (WEPROG, Germany), Bernhard Ernst (RWE Transportnetz Strom, Germany), **Paper_110**

10:20 – 10:40 Discussions, discussion leader: Gregor Giebel (Risø, Denmark)

09:00 – 10:20	Session 5c: Grid Code Issues I (Room Zaragoza)
09:00 – 10:00	Presentations (20 minutes each): <ul style="list-style-type: none">▪ Grid Code and Wind Farm Control Requirements - What to Control, Why, Where and How, Björn Andresen (Gamesa Wind Engineering, Denmark), Knud Johansen (Gamesa Innovation and Technology, Spain), Paper_82;▪ Comparison of High Technical Demands on Grid Connected Wind Turbines Defined in International Grid Codes, Tobias Bublath, Tobias Gehlhaar (Germanischer Lloyd Industrial Services, Germany), Paper_92;▪ The Impact of Grid Codes on the Development of Wind Turbine Technologies, Sigrid M. Bolik (Econnect Consulting, UK), Paper_123;
10:00 – 10:20	Discussions, discussion leader: Ana Estanqueiro (INETI, Portugal)
10:40 – 11:00	Coffee break (Hall and/or Room Zaragoza III)
11:00 – 12:40	Session 6a: Modeling and DC Solutions (Room Zaragoza)
11:00 – 12:20	Presentations (20 minutes each): <ul style="list-style-type: none">▪ Simplified Wind Generator Model for Transmission System Operator Planning Studies, Francisco Rodríguez-Bobada (REE, Spain), Pablo Ledesma (Universidad Carlos III de Madrid, Spain), Sergio Martínez Villanueva, Luis Coronado, Eduardo Prieto (REE, Spain), Paper_47▪ Design and Implementation of an In-site Power Quality Lab Test for Wind Energy, M. García-Gracia, J. Sallán, Diego López Andía, Andrés Llombart-Estopiñán (CIRCE, Spain), Julio J. Melero (CIRCE, University of Zaragoza, Spain), María Paz Comech (Acciona Windpower, Spain), Oscar Alonso (Public University of Navarre, Spain) (Paper_65)▪ VSC HVDC for the Reduction of Wind Power Fluctuations, Ervin Spahic (Technische Universität Darmstadt, Germany), Jutta Hanson (ABB Power Utilities, Germany), Gregory Flieller, Gerd Balzer (Technische Universität Darmstadt, Germany) Paper_42▪ Control and Operation of Multi-Terminal DC Systems for Integrating Large Offshore Wind Farms, Lie Xu (University of Strathclyde, UK), Liangzhong Yao, Masoud Bazargan (AREVA T&D Technology Centre, UK), Barry Williams (University of Strathclyde, UK) Paper_44
12:20 – 12:40	Discussions, discussion leader: Peter Christensen (Vestas, Denmark)
11:00 – 12:40	Session 6b: Cabling Issues (Room Burgos/León)
11:00 – 12:20	Presentations (20 minutes each): <ul style="list-style-type: none">▪ HVAC Cable Systems with Forced-Water Cooling for Wind Energy Transmission, Heinrich Brakelmann, Dongping Zhang, (University Duisburg-Essen, Germany), Paper_90▪ Connection of Wind Energy to the Grid by an Optimized HVAC Cable Concept, H. Brakelmann, J. Brüggmann, Jörg Stammen (University Duisburg-Essen, Germany), Paper_108▪ Grid Integration of Offshore Wind Farms Using Gas-Insulated Transmission Lines; Christian Rathke, Markus Siebert, Lutz Hofmann (Leibniz University Hanover, Germany), Paper_37▪ Optimisation of Compensation Conductor Systems for Magnetic Field Mitigation near to High-Voltage Single-Core Cables, Heiner Brakelmann (Universität Duisburg-Essen, Germany), Paper_4
12:20 – 12:40	Discussions, discussion leader: Heinrich Brakelmann (University Duisburg-Essen, Germany)

- 11:00 – 12:40** **Session 6c: Islanding Projects (Room Salamanca/Ávila)**
- 11:00 – 12:20 Presentations (20 minutes each):
- **Estimation of Power Quality Indicators During a Real Wind Farm Islanding Experiment**, Vladimir Terzija (The University of Manchester, U.K.), V. Stanojevic, G.Štrbac (Imperial College London, UK), K.O.H. Pedersen, J.Ostergaard (Technical University of Denmark), **Paper_35**
 - **Transforming Island Power Supply to Sustainability – The Example of Bonaire**, Markus Pöller, Holger Müller (DIgSILENT, Germany), Karsten Burges (Ecofys, Germany), **Paper_124**
 - **Overview of the Danish Cell Project**, Thomas Ackermann (energynautics, Germany), Per Lund (Energinet.dk, Denmark), Nis Martensen, Eckehard Tröster (energynautics, Germany), Valerijs Knazkins (Royal Institut of Technology, Sweden), **Paper_103**
 - **Parameter Estimation of a Two-Mass Drive Train Model**, Valerijs Knazkins (Energynautics, Germany/Royal Institute of Technology, Sweden), **Paper_100**
- 12:20 – 12:40 Discussions, discussion leader: Thomas Ackermann (energynautics, Germany)
- 13:00 – 14:00** Lunch (Room Toledo III + IV, 3rd floor)
- 14:00 – 15:40** **Session 7a: Grid Code Issues II (Room Zaragoza)**
- 14:00 – 15:20 Presentations (20 minutes each):
- **Review of the Great Britain Security Standards to Include Wind Power**, Manuel Castro, P. Djapic, D. Pudjianto, C. Ramsay, G. Strbac (Imperial College London, UK), Ron N. Allan (University of Manchester, UK), **Paper_76**;
 - **Compliance with International Grid Code Requirements: Discussion of Procedures for Testing Offshore Windfarms**, Ana Morales, X. Robe, (Energy To Quality, Spain) **Paper_24**;
 - **WINDFACT, a Solution for the Grid Code Compliance of the Windfarms in Operation**, Manuel Visiers, J. Mendoza, J. Búnez, F. González, A. Contreras, S. Molina, Andrés Agudo (Gamesa, Spain), **Paper_117**
 - **Precision of Different Frequency Measurement Methods under the Recommendations of Procedure of Verification of the PO 12.3**, J. A. Fuentes (Universidad Politécnica de Cartagena, Spain), M. Mañana (University of Cantabria, Spain), A. Molina-García (Universidad Politécnica de Cartagena, Spain), Emilio Gómez-Lázaro, A. J. Pujante, M. Cañas (Universidad de Castilla-La Mancha, Spain) **Poster_118**
- 15:20 – 15:40 Discussions, discussion leader: Sigrid M. Bolik (Econnect Consulting, United Kingdom)

- 14:00 – 15:40 **Session 7b: Advanced Solutions for Balancing**
(Room Burgos/León)
- 14:00 – 15:20 Presentations (20 minutes each):
- **The Integration of Wind Power into Power Systems - A Case for Flywheel Energy Storage**, Andrew Tuckey (POWERCORP Pty Ltd., Australia), **Paper_50**;
 - **Dispatchable Hybrid Wind / Solar Power Plant**, Mark Kapner (Austin Energy, USA), **Paper_7**;
 - **Hydrogen as a Means of Controlling and Integrating Wind Power in Electricity Grids**, Robert Steinberger-Wilckens, Jörg Linnemann (PLANET Planungsgruppe Energie und Technik, Germany), Andreas Ballhausen, Ewald Heyen (EWE, Germany), Detlev Heinemann (Oldenburg University, Germany), Heike Kröger, Sebastian Styrnol (Projekt Ökoveat, Germany), Matthias Lange (Energy & Meteo Systems, Germany), Hans-Peter Waldl (Overspeed, Germany), **Paper_39**;
 - **Benefits of Storage and DSM in Transmission Congestion Management in Systems with High Wind Penetration**, Vera Silva, V. Stanojevic, D. Pudjianto, G. Strbac (Imperial College London, UK), **Paper_81**;
- 15:20 – 15:40 Discussions, discussion leader: Juan Rivier Abbad (Iberdrola Renewables, Spain)
- 15:40 – 16:00 Coffee break (Hall and/or Room Zaragoza III)
- 16:00 – 16:45 **Session 8: Closing Session** (Room Zaragoza)
- 16:00 – 16:40 Podium discussions
- Moderators: Charles Smith (UWIG, USA)
Thomas Ackermann (Energynautics, Germany)
- Participants: Alberto Ceña (AEE, Spain)
Peter Christensen (Vestas, DK)
Ana Estanqueiro (INETI, Portugal)
Rob Gramlich (AWEA, USA)
Hannele Holttinen (VTT, Finland)
Nicholas Miller (GE, USA)
Antje Orths (Energinet.dk, Denmark)
- 16:40 – 16:45 Closing remarks

Wednesday 28 May 2008 – Field Trip

Schedule 1

(all features are included in the field trip charge – times may vary due to traffic)

09:15	Bus departs from the Hotel Meliá Avenida América to the province of Toledo
10:30 – 11:30	Visit of the Iberdrola CORE, Toledo
11:30 – 12:00	Bus to Villacañas
12:00 – 13:30	Visit of the Villacañas wind farm
14:00 - 15:30	Lunch
15:30 – 16:30	Bus back to Madrid
16:30 – 17:30	Visit of the control centre of REE - Red Eléctrica (CECOEL) in Alcobendas
17:30 – 18:00	Bus returns to the Hotel Meliá Avenida América

Schedule 2

(all features are included in the field trip charge- times may vary due to traffic)

09:30	Bus departs from the Hotel Meliá Avenida América to REE in Alcobendas
09:45 – 10:45	Visit of the control centre of REE - Red Eléctrica (CECOEL) in Alcobendas
11:00 – 12:00	Bus to Villacañas
12:00 – 13:30	Visit of the Villacañas wind farm
14:00 - 15:30	Lunch
15:30 – 16:00	Bus to Iberdrola, Toledo
16:00 – 17:00	Visit of the Iberdrola CORE, Toledo
17:00 – 18:00	Bus returns to Madrid, Hotel Meliá Avenida América

POSTERS

Study of the Sympathetic Interactions when Energizing Transformers for Wind-Farms: Description of the Phenomena Involved and Determination of the Stresses during their Energization

Michel Rioual (EDF-THEMIS, France), Mahamane Sow (SUDRIA, France) (**Poster_8**)

A New Control Methodology of Wind Farm for Load Frequency Control of Power System in Isolated Island

Tomonobu Senjyu, Toshiaki Kaneko, Atsushi Yona (University of the Ryukyus, Japan), Toshihisa Funabashi (Meidensha Corporation, Japan), Chul-Hwan Kim (Sungkyunkwan University, Korea), Hideomi Sekine (University of the Ryukyus, Japan) (**Poster_16**)

Voltage Stability Analyses for Determination of Optimal Connection Points of Wind Farms

Arefeh Danesh Shakib, Ervin Spahic', Gerd Balzer (Technische Universität Darmstadt, Germany) (**Poster_17**)

Decentralized Energy Management System for the Distribution Grid Using an Intelligent Agents Approach

Elvira Kaegi, Rachid Cherkaoui, Alain Germond (Swiss Federal Institute of Technology, Switzerland) (**Poster_19**)

Wind power Integration and Forecasting in the Mexican Electric Power System

A. Rodríguez-García, E. De la Torre-Vega (IIE Instituto de Investigaciones Eléctricas - Mexican Electric Power Research Institute, México), A. Sánchez-Sánchez (CFE Mexican Federal Electrical Commission, Mexico) (**Poster_20**)

Models for HLI Analysis of Power Systems with Offshore Wind Farms and Distributed Generation

Nicola Barberis Negra (DONG Energy, Denmark), Ole Holmstrøm (DONG Energy, Denmark), Birgitte Bak-Jensen (Aalborg University, Denmark), Poul Sørensen (Risø National Laboratory, DTU, Denmark) (**Poster_25**)

Siemens Windpower 3.6 MW Wind Turbines for Large Offshore Windfarms

Vladislav Akhmatov, Jørgen Nygaard Nielsen, Jan Thisted, Erik Grøndahl, Per Egedal, Michael Nørtoft Frydensbjerg, Kim Høj Jensen (Siemens Wind Power, Denmark) (**Poster_26**)

Hiumaa Large-Scale Offshore Wind Park Integration into Estonian Grid

Hannes Agabus (Nelja Energia, Estonia), Heiki Tammoja, Ivo Palu (Tallinn University of Technology, Estonia) (**Poster_29**)

Model for Market Optimization of the Wind Farm and Battery Power Output

Ervin Spahic', Arefeh Danesh Shakib, Helmut Bockshammer, Gerd Balzer (Technische Universität Darmstadt, Germany) (**Poster_33**)

Synthetic Time Series Generation for Calculating the Value of Wind Power: Models and Value

Jan De Decker, Achim Woyte (3E sa, Belgium) (**Poster_41**)

Energy Storage for Wind Power Integration and Management

Jose Luis Porta Albelo (Hidrogena Atlántica S.L., Spain) (**Poster_51**)

Modeling of the Credible Capacity Distribution of Multi Grid-Connected Wind Farms in Same Wind Belt

Zongxiang Lu, Jiageng Qiao, Fei Xu, Yong Min (Tsinghua University Beijing, China) (**Poster_57**)

Offshore Wind Power in the North Sea

Knut Magnus Sommerfelt (The Norwegian University of Science and Technology, Norway), Terje Gjengedal, Espen Hagstrøm (Statkraft, Norway) (**Poster_63**)

Comparison between Different Ways of Connecting a Large Scale Offshore Wind Farm with the Onshore Grid, Tobias Aigner (FernUniversität Hagen, Germany), Terje Gjengedal, Leon Eliassen Notkevitch, Espen Hagstrøm, (Statkraft, Norway) (**Poster_75**)

Characterization and Modelling of the Variability of the Power Output of Aggregated Wind Farms

Cesar Augusto Quintero Marrone, Kaspar Knorr, Bernhard Lange (ISET, Germany), Hans Georg Beyer (Hochschule Magdeburg-Stendal, Germany) (**Poster_77**)

The Integration of Hydrogen Generation with Wind Generation Distribution Networks for Increased Penetration of Wind Power

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