

# DEWEK 2006: Preliminary Programme

## Lectures

### 22.11.2006, Wednesday

08:00 Registration in the Foyer of the Conference Hall

#### Opening Session

Room: 1 - Chairman: J. P. Molly

09:00 Opening Session

Speakers will be published later

10:30 Coffee Break

#### Session No. 1: Wind Resource I

Room: 1 - Chairman: N. N.

11:00 Analysis of Energy Yield Study Accuracy by Evaluation of Wind Farm Operational Data

M. Strack, P. Spengemann, DEWI; V. Borget, DEWI France; J. Fischer, Bremer Landesbank

11:15 Energy Prediction Uncertainty in Complex Terrain: a Case Study

B. Ait-Driss, F. Pelletier, M. Dimitrijevic, C. Sibuet-Watters, Helimax Energy Inc., Canada

11:30 Computer Tool to Identify Promising Areas for Wind Farm Installation and Energy Prediction

A. L. de Sá, V. G. Guedes, CEPEL, Brazil; S. R. Melo, FPLF, Brazil; P. Bezerra, CHESF, Brazil

11:45 A New Comprehensive Compendium of Statistical Wind Data for Germany

J. Sebecker, B. Wichura, U. Behrens, Th. Deutschländer, Deutscher Wetterdienst

12:00 Thermally Induced Boundary-Layer Flows Over Step-in-Roughness Changes and Topography

P. A. Taylor, W. Weng, York University, Canada; H. Liu, ORTECH Consulting Inc., Canada

12:15 Discussion

12:45 Lunch Break

#### Session No. 2: Condition Monitoring

Room: 2 - Chairman: N. N.

11:00 Managing Gearbox Failures, Condition Monitoring and Measurement

D. Kitaljevich, GasTOPS Ltd., Canada; S. Leske, momac Maschinenbau GmbH & Co. KG

11:15 Alpine Test Site Gütsch: Monitoring of a Wind Turbine under Icing Conditions

R. Cattin, S. Kunz, G. Russi, METEOTEST, Switzerland; A. Heimo, Federal Office of Meteorology and Climatology, Switzerland; M. Russi, Elektrizitätswerk Ursern, Switzerland

11:30 Continuous Natural Frequency Monitoring of Rotor Blades for Detection of Damages, Ice-foundation and Dynamic Overloads

P. Volkmer, F. Müller, D. Volkmer, D. Schollbach

11:45 Condition Monitoring and Maintenance Strategies for the Next Generation of Large Offshore Wind Turbines

J. Giehard, P. Caselitz, ISET e. V.

12:00 PREWIND - Development of a Methodology for Preventive Maintenance of Windturbines Through the use of Thermography

C. Ferber, Technologie Transfer Zentrum Bremerhaven; V. Schulz, Fördergesellschaft Windenergie e. V.

12:15 Discussion

12:45 Lunch Break

#### Session No. 3: Modelling Wind

Room: 3 - Chairman: N. N.

11:00 Direct Numerical Simulation of the Turbulent Flow Around an Airfoil for Wind Turbines Using Spectral/HP Method

B. Stoevesandt, J. Peinke, ForWind; A. Shishkin, C. Wagner, DLR Göttingen

11:15 New Aerodynamical Modelling of Vertical Axis Wind-Turbines with Application to Flow Conditions with Rapid Directional Changes

A. P. Schaffarczyk, CE-Wind Schleswig-Holstein and University of Applied Sciences Kiel

11:30 Comparison of Aerodynamic Loads from New Turbulence Models Deduced by Statistical Fluid-Mechanics with those used in Standard Guidelines

H. Gontier, A. P. Schaffarczyk, CE-Wind Schleswig-Holstein and University of Applied Sciences Kiel; D. Kleinhans, R. Friedrich, Westfälische Wilhelms-Universität Münster

11:45 GumbelWind – A Computer Code for Statistical Extrapolation of Ultimate Loads on Wind Turbines

M. Hänler, U. Ritschel, Windrad Engineering GmbH

12:00 Modelling of Offshore Wind Speed Conditions

J. Tambke, L. von Bremen, ForWind; J. A.T. Bye, Univ. of Melbourne, Australia; B. Lange, ISET e.V.; L. Claveri, Finnish Meteorological Institute, Finland; C. Poppinga, Deutsche WindGuard Consulting GmbH; J.-O. Wolff, Univ. of Oldenburg

12:15 Discussion

12:45 Lunch Break

#### Session No. 4: Wind Resource II

Room: 1 - Chairman: N. N.

13:45 Long-term Scaling of Site Measurements: Evaluation of Long-term Meteorological Data in France and Comparison of Correlation Methods

P.-A. Monnier, V. Borget, DEWI France; M. Strack, DEWI

14:00 Evaluation of ZephIR

A. Albers, Deutsche WindGuard Consulting GmbH

14:15 High Sophisticated On- and Offshore Investigations of Three Dimensional Wind Velocity and Direction Measurements by a Moved Sensory System

C. Holze, Friedrich Wilhelm Bessel Institute and Centre of Applied Space Technology and Microgravity/Univ. Bremen; A. Schöne, Friedrich Wilhelm Bessel Institute/Univ. Bremen; J. Krieger, Friedrich Wilhelm Bessel Inst./Thales Instruments GmbH; A. Higgen, Thales Instruments GmbH; H.-J. Rath, Centre of Applied Space Technology and Microgravity/Univ. Bremen

14:30 Applicability of the Reanalysis Data to Evaluate the Long-term Variation of Wind Speed in Asia

S. Kitaya, Y. Yuuki, N. Hayasaki, H. Fukuda, CRC Solutions Corp, Japan

14:45 UAV-based Aerial Photography as Support Tool for Wind Resource Estimations

F. Dierich, I. H-P Waldl, Overspeed GmbH & Co. KG; W. Nebel, A. Schallenberg, University of Oldenburg

15:00 Discussion

15:30 Coffee Break

**Session No. 5: Component Optimisation I**

Room: 2 - Chairman: N. N.

- 13:45 **Defect Detection in Rotor Blades using Thermographic Inspection Techniques**  
P. Meinschmidt, J. Aderhold, Fraunhofer-Institute for Wood Research (WKI)
- 14:00 **A New Design Approach for Composites with Improved Damping Properties**  
M. Kochmann, I. Gebauer, D. H. Müller, Bremer Institut für Konstruktionstechnik - Universität Bremen
- 14:15 **Quality Improvement of Rotor Blades**  
I. Gebauer, D. H. Müller, J.-H. Ohlendorf, M. Kochmann, L. Weigel, Univ. Bremen, Bremen Institute for Engineering Design
- 14:30 **Tuned Liquid Column Dampers in Wind Turbines, First Results of Full Scale Demonstration**  
A.J. Wilmink, S. Kuhnt, J.F. Hengeveld, Mecal, The Netherlands
- 14:45 **Gearless Transmissions for Large Wind Turbines.**  
W. Rampen, Artemis IP Ltd, Scotland
- 15:00 **Discussion**
- 15:30 **Coffee Break**

**Session No. 6: Wind Farm Effects**

Room: 3 - Chairman: N. N.

- 13:45 **Farm Efficiencies in Large Wind Farms**  
K. Mönnich, D. Zigras, DEWI
- 14:00 **New Developments in Precision Wind Farm Modelling**  
W. Schlez, A. Neubert, J. Phillips, Garrad Hassan and Partners Ltd.
- 14:15 **Beyond the Ainslie Model: 3D Navier-Stokes Computation of Wind Flow through Large Offshore Wind Farms**  
V. Riedel, T. Neumann, M. Strack, DEWI
- 14:30 **Verification of Wind Field Simulations**  
H.-T. Mengelkamp, S. Huneke, J. Geyer, anemos Gesellschaft für Umweltmeteorologie mbH
- 14:45 **Aeroelastic Simulation of a Multi-MW Wind Turbine Operating in Wake**  
J. J. Trujillo, University of Stuttgart
- 15:00 **Discussion**
- 15:30 **Coffee Break**

**Session No. 7: Wind Power Forecast I**

Room: 1 - Chairman: N. N.

- 16:00 **The Art of Energy Forecasting - Chances and Limitations**  
J. Sander, Sander + Partner GmbH, Switzerland
- 16:15 **Artificial Intelligence in Operation: Application of two Different Forecast Models for the Prediction of Wind Power in Germany**  
F. Schlägl, R. Jursa, B. Langer, K. Rohrig, ISET e.V.
- 16:30 **Optimal Combination of Different Numerical Weather Models for Improved Wind Power Predictions**  
R. Meyer, M. Lange, U. Focken, energy & meteo systems GmbH; M. Denhardt, Deutscher Wetterdienst; B. Ernst, F. Berster, RWE Transportnetz Strom GmbH
- 16:45 **Forecasting Wind Power in High Wind Penetration Markets, Using Multi-Scheme Ensemble Prediction Methods**  
C. Möhrlen, J. U. Jørgensen, WEPROG; S. J. Lang, University College Cork, Ireland
- 17:00 **Next Generation Short-term Forecasting of Wind Power – Results of the ANEMOS Project.**  
I. Waldl, Overspeed GmbH & Co. KG; G. Kariniotakis, Ecole des Mines de Paris, Center for Energy & Processes, France; for the ANEMOS Team
- 17:15 **Discussion**

**Session No. 8: Component Optimisation II**

Room: 2 - Chairman: N. N.

- 16:00 **The Wind Energy Sector Goes Offshore - Germany Establishes a Center of Competence for Wind Energy**  
H.-G. Busmann, A. Berg-Pollack, C. Kensche, Fraunhofer Center for Windenergy and Maritime Technologies (CWMT)
- 16:15 **Problems of a Reliable Connection Between Steel Tower and Concrete Foundation**  
M. Gutermann, Hochschule Bremen; K. Steffens, Prof. Dr.-Ing. Steffens Ingenieurgesellschaft mbH
- 16:30 **Feasibility Study for the Recycling of Composite Material (MaVeFa)**  
T. Brahms, U. Kühne, Forschungs- und Koordinierungsstelle Windenergie (fk-wind); H. Albers, Hochschule Bremen
- 16:45 **Modern Technology with Traditional Looks: Windmill de Nolet**  
E. Schröer, Mecal, The Netherlands
- 17:00 **A Damage Approach for Concrete Constructions Subjected to Multi-stage Fatigue Loading**  
J. Göhlmann, J. Grünberg, University of Hannover
- 17:15 **Discussion**

**Session No. 9: Power Performance**

Room: 3 - Chairman: N. N.

- 16:00 **Exploiting Portfolio Effects in Diversified Project Bundles – A Quantitative Analysis of Potentials and Implications for Financial Engineering**  
M. Strack, DEWI; A. Boensch, F. Hulsch, ENERTRAG Structured Finance; D. Hartmann, ENERTRAG AG
- 16:15 **Wind Farm Performance Verification**  
H. Klug, H. Mellinghoff, DEWI
- 16:30 **The Influence of Meteorological Parameters on the Operational Behavior of a Multimegawatt WEC**  
K. Bleibler, T. Kramkowski, DEWI; K. Braun, N. Cosack, Universität Stuttgart
- 16:45 **Detailed Analysis of the Wind Related Power Fluctuations and Energy Gain of a PMSM Wind Power Station**  
S. Jensen, University of Kiel
- 17:00 **Getting Wind Turbine Power Curves from Fluctuating Data**  
E. Anahua, J. Gottschall, St. Barth, J. Peinke, ForWind
- 17:15 **Discussion**

**Poster Exhibition with Authors Presents**

Hanse Saal - 17:30-19:00

The authors will be available for discussion of their posters and answering of questions.

**Conference Dinner and Reception**

Location: Town Hall of Bremen - 19:30

On the evening of the first conference day the Senat of the city state of Bremen will give at the historic town hall of Bremen a reception for the participants of the dinner. After the reception, the DEWEK conference dinner will be held at the same place.

**23.11.2006, Thursday**08:00 **Registration in the Foyer of the Conference Hall****Session No. 10: Wind Power Forecast II**

Room: 1 - Chairman: N. N.

- 08:30 **Short-Term Wind Energy Prediction Using On-Line Weather Forecast**  
M. H. Abderrazzaq, Yarmouk University, Jordan

- 08:45 **Short-term Wind Power Prediction Using Neural Networks**  
A. Hilden, J. Thiesen, Vejr2 A/S, Denmark
- 09:00 **A new Approach for Uncertainty Estimation in Wind Power Predictions**  
U. Gräwe, J. Tambke, L. von Bremen, N. Saleck, ForWind
- 09:15 **Forecast Management for Effective Energy Capture Calculation at Offshore Wind Plant Locations**  
M. Splett, J. Bendfeld, J. Voss; University of Paderborn
- 09:30 **Energy Economic Assessment of Large Scale Electricity Storage Applications in Central Europe - Does Growing Wind Power in Europe Boost the Economic Profitability of Storages and Vice Versa?**  
C. Gatzen, University of Cologne (EWI)
- 09:45 **Discussion**
- 10:15 **Coffee Break**

### Session No. 11: Rotor Blade-Design & Control

Room: 2 - Chairman: N. N.

- 08:30 **Rotor Blade Monitoring – The Technical Essentials**  
H. Söker, DEWI; A. Berg-Pollack, C. Kensche, Fraunhofer Center Windenergie und Meerestechnik;
- 08:45 **Load Assumptions for the Design of Electro Mechanic Pitch Systems**  
J.-B. Franke, A. Manjock, Germanischer Lloyd WindEnergie GmbH; H. Hemker, H. G. Osterholz, OAT GmbH
- 09:00 **H- based Independent Blade Pitch Control Design for Load Reduction on Large Wind Turbines**  
M. Geyler, P. Caselitz, ISET e.V.
- 09:15 **Active Wind Turbine Control Utilizing Measurements from Fibre Optical Load Sensors to Adjust Individual Blade Angle Integrated in to an Electro-mechanical Pitch System**  
J.-Th. Wernicke, R. Byars, J. Shadden, Ch. Schmoeller, WindForce GmbH; H. Kestermann, SSB GmbH & Co KG; P. Rhead, Insensys Ltd., UK; E. Bossanyi, Garrad Hassan & Partners Ltd., England
- 09:30 **New Results from the European SIROCCO Project: Silent Rotors by Acoustic Optimization**  
Th. Lutz, W. Würz, A. Herrig, K. Braun, E. Krämer, Univ. Stuttgart; J. G. Schepers, A. P. W. M. Curvers, ECN, The Netherlands; S. Oerlemans, National Aerospace Laboratory NLR, The Netherlands; A. Matesanz, Gamesa Eólica, Spain; R. Ahrelt, T. Maeder, S. Herr, GE Wind Energy/GE Global Research
- 09:45 **Discussion**
- 10:15 **Coffee Break**

### Session No. 12: Operational Experiences

Room: 3 - Chairman: N. N.

- 08:30 **+15 Years Operational Experiences with Wind Power ...and then...?**  
M. Durstewitz, B. Hahn, K. Rohrig, ISET e.V.
- 08:45 **Error Statistics for the Gearbox in Drive Trains of WEC**  
J. Holzmüller, 8.2 Ingenieurbüro Holzmüller Aurich
- 09:00 **Improving Wind Turbine Availability by Reliability Based Maintenance**  
B. Hahn, ISET e.V.; H. Jung, Ingenieurgesellschaft Zuverlässigkeit und Prozessmodellierung (IZP)
- 09:15 **COST Action 727, Part 1: Overview of Atmospheric Icing on Structures - Final Report, Phase 1**  
B. Tammelin, FMI, Finland; L. Makkonen, VTT, Finland; H. Dobesch, Austria
- 09:30 **COST Action 727, Part 2: Measuring Atmospheric Icing on Structures - Final Report, Phase 1**  
S. Fikke, Norway; B. Wichura, Deutscher Wetterdienst; T. Laakso, VTT, Finland; G. Ronsten, FOI, Sweden
- 09:45 **Discussion**
- 10:15 **Coffee Break**

### Session No. 13: Offshore Foundation

Room: 1 - Chairman: N. N.

- 10:45 **Influence of Wave Spreading in Short-term Sea States on the Fatigue of Offshore Support Structures at the Example of the FINO1-Research Platform**  
C. Böker, P. Schaumann, University of Hannover
- 11:00 **Fatigue of Grouted Joint Connections**  
F. Wilke, P. Schaumann, University of Hannover
- 11:15 **Offshore Gravity Foundations in Concrete - New Construction Technologies for the Future**  
H. Mathis, F. Hasberger, G. Sutter, RSB Schalungstechnik GmbH&Co, Austria
- 11:30 **Prediction Of Monopile Deformation Under High Cyclic Lateral Loading**  
P. Hinz, K. Lesny, W. Richwien, Univ. of Duisburg-Essen
- 11:45 **New BAUER Flydrill System Drilling Monopiles at Barrow Offshore Wind Farm, UK**  
W. G. Brunner, Bauer Maschinen GmbH
- 12:00 **Discussion**
- 12:30 **Lunch Break**

### Session No. 14: Design Loads

Room: 2

Chairman: N. N.

- 10:45 **The New Standard IEC 61400-1 ed. 3 and its Effect on the Load Level of Wind Turbines**  
K. Freudenreich, K. Argyriadis, Germanischer Lloyd WindEnergie
- 11:00 **A Guide to Design Load Validation**  
J. Kröning, DEWI-OCC; H. Söker, DEWI
- 11:15 **Experiences with the Extrapolation of Extreme Loads Using Probabilistic Methods According to IEC 61400-1 ed. 3: Wind Turbines - Part 1: Design Requirements**  
A. Heitmann, H. O. Wulf, W. Petruschke, T. Hahm, TÜV NORD SysTec GmbH & Co. KG
- 11:30 **Determination of Extreme Winds According to the New IEC 61400-1, ed. 3**  
W. Winkler, M. Strack, DEWI
- 11:45 **MEASNET LOADS – Commenting ‘IEC-Dash 13’**  
O. Bruhn, Windtest Kaiser-Wilhelm-Koog GmbH; H. Söker, DEWI; M. Grapentin, Windtest Grevenbroich GmbH; H. Braam, Energy Research Centre of the Netherlands, The Netherlands; F. Mouzakis, Centre of Renewable Energy Sources, Greece; S. M. Petersen, RISØ National Laboratories Wind Energy Department, Denmark; T. Kleinselbeck, Wind Consult GmbH; A. O. Vazquez, CENER National Renewable Energies Centre, Espana
- 12:00 **Discussion**
- 12:30 **Lunch Break**

### Session No. 15: Grid Integration I

Room: 3 - Chairman: N. N.

- 10:45 **Revised E.ON Grid Code Requirements for the Future Secure System Operation**  
I. Erlich, J. Löwen, W. Winter, E.ON Netz GmbH
- 11:00 **Experience with more than 1000 Voltage dip Free Field Tests of Wind Turbines**  
J. Möller, WINDTEST Kaiser-Wilhelm-Koog GmbH
- 11:15 **Extended Operating Control to Integrate German (Offshore) Wind Farms**  
M. Wolff, R. Mackensen, G. Füller, B. Lange, K. Rohrig, ISET e. V.
- 11:30 **Influence of Transmission Lines on Grid Connection**  
F. Santjer, DEWI; M. Marks, TU Clausthal

- 11:45 **HyWindBalance: New Markets for Wind Power by Combining Wind Farms and Hydrogen Storage Systems**  
H.-P. Waldl, Overspeed GmbH & Co. KG; R. Steinberger, PLANET GbR
- 12:00 **Discussion**
- 12:30 **Lunch Break**

### Session No. 16: Offshore Marine Environment

Room: 1 - Chairman: N. N.

- 13:30 **One Year Operation of Offshore Metmast Amrum-bank West**  
J. Bendfeld, M. Splett, J. Voss, University of Paderborn; A. Higgen, J. Krieger, Thales Instruments GmbH
- 13:45 **Oceanographic Results of Two Years Operation of the First Offshore Wind Research Platform in the German Bight - FINO1**  
K. Herklotz, Federal Maritime and Hydrographic Agency
- 14:00 **Offshore Wind Design Parameters – Status Report on the Research Project OWID**  
T. Neumann, V. Riedel, DEWI; S. Emeis, M. Türk, FZ Karlsruhe (IMK-IFU); C. Illig, DEWI-OCC
- 14:15 **Influence of Irregular Wave Kinematics Description on Fatigue Load Analysis of Offshore Wind Energy Structures**  
M. Kohlmeier, K. Mittendorf, A. Habbar, W. Zielke, University of Hannover
- 14:30 **Estimated Extreme Winds in the German Bight**  
M. Türk, S. Emeis, Forschungszentrum Karlsruhe GmbH
- 14:45 **Discussion**
- 15:15 **Coffee Break**

### Session No. 17: Aeroelastic & Multibody Simulation

Room: 2 - Chairman: N. N.

- 13:30 **Control Requirements for Load Mitigation of Aerodynamic and Hydrodynamic Loads of Offshore Wind Turbines**  
T. Fischer, P. Passon, M. Kühn, University of Stuttgart
- 13:45 **On the Analysis of Dynamic Loads in Complete Wind Turbines using a Combined Multibody-System- and Finite-Element-Model**  
B. Schlecht, T. Schulze, T. Hähnel, T. Rosenlöcher, M. Höfgen, TU Dresden (IMM)
- 14:00 **Aero-elastic Simulation of a Wind Turbine and Drive Train Resonance Analysis using the Multibody Simulation Code SIMPACK**  
S. Hauptmann, N. Cosack, M. Kühn, University of Stuttgart; Lutz Mauer, INTEC GmbH
- 14:15 **Impact of Wind Turbine Drive Train Concepts on Dynamic Gearbox Loads**  
A. Heege, J. Betran, Y. Radovcic, SAMTECH Iberica, Spain; P. Viladomiu, M. Latorre, J. M. Cantons, ECOTÈCNIA s.coop.c.l., Spain
- 14:30 **Simulation of the Vibration Behaviour of Wind Turbines Considering Dynamic Loads**  
P. W. Gold, R. Schelenz, A. Kube, D. Möller, RWTH-Aachen University
- 14:45 **Discussion**
- 15:15 **Coffee Break**

### Session No. 18: Grid Integration II

Room: 3 - Chairman: N. N.

- 13:30 **Integration of Wind Power into the European Power Grid**  
J. Müller, GENI - Gesellschaft für Netzintegration e.V.
- 13:45 **Virtual Power Plant for Balance Power**  
J. Strese, STEAG Saar Energie AG

- 14:00 **Trading Wind Energy on Electricity Markets**  
U. Focken, M. Lange, energy & meteo systems GmbH
- 14:15 **Advanced Tools for the Management of Electricity Grids with Large-Scale Wind Generation**  
G. Kariniotakis, Ecole des Mines de Paris, Centre for Energy & Processes, France; I. Waldl, Overspeed GmbH & Co. KG; for the ANEMOS.plus Team
- 14:30 **WINDebit: an Alternative way to Handle Wind Farms Like Power Stations**  
H. Krebs, E. Steinbach, Ingenieurbüro Kuntzsch GmbH
- 14:45 **Discussion**
- 15:15 **Coffee Break**

### Session No. 19: Offshore Project Realisation

Room: 1 - Chairman: N. N.

- 15:45 **European Offshore Wind Farms - A Survey to Analyse Experiences and Lessons Learnt by Developers of Offshore Wind Farms**  
A. Tiedemann, German Energy Agency GmbH
- 16:00 **WeserWind GmbH Builds First Offshore-Tripod**  
C. Bussler, WeserWind GmbH Offshore Construction Georgsmarienhütte
- 16:15 **Measurement and Reduction of Offshore Wind Turbine Construction Noise**  
K.-H. Elmer, W.-J. Gerasch, Universität Hannover; T. Neumann, J. Gabriel, DEWI; K. Betke, M. Schultz-von Glahn, ITAP
- 16:30 **Offshore Wind Farms (Project Financing)**  
T. Hinsche, Commerzbank AG
- 16:45 **Technical Challenges and their Solution of the DOWNWinD Project in 45m Water Depth**  
M. Seidel, D. Gosch, U. Peters, REpower Systems AG
- 17:00 **Discussion**
- 17:15 **Closing the Conference**  
J. P. Molly, DEWI

### Posters

Room: Hanse Saal

#### 1 Performance Verification

- 1.1 **Performance Verification of Wind Farms on Operation in the State of Ceará – Brazil**  
H. T. Ferreira, University of São Paulo, Brazil
- 1.2 **A Consideration on Definition of Complex Terrain**  
N. Hayasaki, R. Tanikawa, CRC Solutions Corp, Japan; H. Matsumiya, Kyushu University, Japan; T. Kogaki, National Inst. of Advanced Industrial Science and Technology, Inst. of Energy Utilization, Japan
- 1.3 **Uncertainty of Annual Energy Production for a Specific Turbine Model Based on a Set of IEC 61400-12 Measurements**  
H. Mellinghoff, U. Bunse, O. Haack, DEWI
- 1.4 **Micrositing of Small-Scale Wind Turbines is More Economical Viable for Rural Electrification in Sri Lanka**  
M. Narayana, NERD Centre of Sri Lanka

#### 2 New Developments

- 2.1 **The Latest Step of the Proven Mx Series – Design Changes & Operational Results of REpowers Latest Commercial Wind Turbine MM92**  
C. Draheim, REpower Systems AG
- 2.2 **Wind Turbine Towers: Trends and Issues**  
Z. Badar, A. Shah, V. R. Tanti, Suzlon Infrastructure Ltd., India
- 2.3 **Glassfibre Reinforced Plastics Rotor Blades – Rapid, Improved and Economical! Innovative Process-Technologies for Automised Technical Textile Handling**  
C. Dörsch, I. Gebauer, D. H. Müller, Universität Bremen, Bremer Institut für Konstruktionstechnik



- 2.4 Integrated Software for Wind Turbine Design & Development Analysis**  
C. Rachor, Y. Song, Romax Technology Ltd, Germany and UK; L. Seung-Kuh, Hyosung Corporation, South Korea
- 2.5 The Dynamic Wind Power Captureability of a High Performance SHWT - Zephyr's "Airdolphin"**  
R. Ito, Zephyr Corporation, Japan; H. Matsumiya, Kyushu University, Japan; C. Arakawa, M. Iida, University of Tokyo, Japan
- 2.6 Control Method of Variable Speed Wind Turbine and its Effects Acted on Power Systems**  
X. Zhang, Xi'an Jiaotong University, China; W. Wang, Xinjiang University, China; S.X.Ding, University of Duisburg-Essen
- 2.7 Development of BR-W Airfoils for Wind Turbine Rotor Blades to Operate in the Environmental Conditions of the Brazilian Northeast**  
E. L. de Morais, L. A. J. Procopiak, LACTEC, Brazil; F. L. Galvão, O. C. do Amarante, Camargo-Schubert Engenharia Eólica Ltda; Brazil; P. B. de Carvalho Neto, P. C. de Souza Câmara, CHESF, Brazil
- 2.8 High Efficiency + Simplified Design – The VENSYS Low-Risk Approach to Reduce the Cost of Wind Energy**  
S. Jöckel, D. Knünz, J. Millhoff, J. Rinck, VENSYS Energiesysteme GmbH & Co. KG
- 2.9 Design of Maintenance Free Bolted Joints in the Wind Turbine Generator Load Path**  
J.-T. Wernicke, R. Byars, J. Shadden, WindForce GmbH; F. Scheuch, R. Kociorski, J. Meisterling PFW Technologies GmbH
- 2.10 Consultative Certification - A New Approach for Efficient Development and Certification of Wind Turbines**  
N. Hille, A. Andreae, Germanischer Lloyd WindEnergie

### 3 Simulation I (Wind Turbine)

- 3.1 Design of Winglets for Retrofitting Wind Turbine Rotor Blades**  
F. Richter, T. Rische, cp.max Rotortechnik GmbH & Co. KG
- 3.2 Data Reconciliation and Gross Error Detection of the Generator of a Wind Turbine**  
O. Bennouna, N. Héraud, P. Poggi, G. Notton, Université de Corse, France; O. Malasse, 3SI-ENSAM, France;
- 3.3 Modelling of the Wind Turbine Rotor for Load Flow Studies**  
A. R. Filgueiras, T. M. da mata Branco, A. P. de Moura, Universidade Federal do Ceará, Brazil
- 3.4 Energy Management for a Small Wind Turbine Controlling the Priority of the Loads Using the Simulation Program Matlab and the LCC Method**  
I. Negrea, G. Dragusin, I. Visa, Transilvania University of Brasov, Romania

### 4 Simulation II (Wind)

- 4.1 Local Short-term Forecasting for Wind Power Plants in Brazil**  
L. von Bremen, ForWind; L. Lisbôa, R. Haas, F. Araujo, C. Maciel, S. L. Abreu, S. Colle, LEPTEN/EMC/UFSC, Brazil
- 4.2 International State-of-the-art in Wind Power Forecasting and Future Developments**  
M. Lange, U. Focken, energy & meteo systems GmbH
- 4.3 Simulation of Intermittent Wind Fields: A New Approach**  
D. Kleinhans, R. Friedrich, Universität Münster; H. Gontier, A. P. Schaffarczyk, CE-Wind Schleswig-Holstein and University of Applied Sciences Kiel

- 4.4 Exploring the Upper Limit of the Surface Boundary Layer - Wind Power Estimation for Extreme Hub Heights**  
R. Cordsen, I. H-P Waldl, Overspeed GmbH & Co. KG; J. Parisi, University of Oldenburg
- 4.5 Wind Power Prediction using Multi – Ensemble Numerical Weather Prediction System Approach**  
Ü. Cali, B. Lange, K. Rohrig, Institut für Solare Energieversorgungstechnik e. V. (ISET); C. Moehrlen, J. U. Jørgensen, Weather & Wind Energy Prognosis (WEPROG)
- 4.6 Simulation of Turbulent Wind Fields with Multifractal Statistics**  
M. Greiner, J. Cleve, Siemens AG
- 4.7 Application of a Micro-scale Wind Park Model**  
G. Gross, Universität Hannover; N. Lanfer, geonet Hannover; C. Land, meteoterra, Rinteln
- 4.8 De-Trending Turbulence Measurements – Identification of Trends and their Suppression**  
M. Damaschke, K. Mönnich, DEWI
- 4.9 Evaluation of Wind Power Prediction Using Statistical or Physical Approaches**  
N. Saleck, L. von Bremen, J. Tambke, U. Graewe, D. Heinemann, ForWind
- 4.10 Enhanced Regional Forecasting by Single Site Prediction and Upscaling Techniques**  
L. von Bremen, N. Saleck, J. Tambke, D. Heinemann, ForWind

### 5 Measurements

- 5.1 A Normalization, Filtering and Data Reduction System for an Internet-Accessed Wind-Data Bank**  
M. H. Hirata, Denis R. Petrucci, IEM/UNIFEI and FAT/UERJ, Brazil; R. O. P. Araújo, G. C. R. Bodstein, LAFAE and PEM-COPPE/UFRRJ, Brazil
- 5.2 Wind Energy Resource Map of State of Paraná, Brazil: Revising the 1999 Results with New Measurements and Mesoscale Modelling**  
O. Camargo, F. J. L. da Silva, E. Parecy, Camargo-Schubert Ltda, Brazil; D. J. Schultz, COPEL Geração, Brazil; L. A. J. Procopiak, R. P. Dorweiler, LACTEC, Brazil

### 6 Grid Integration and Application

- 6.1 On Predictability and Grid Integration of 25 GW German Wind Power - Simulating the Production for the Years 2001-2005 with Actual NWP Data**  
L. von Bremen, J. Tambke, N. Saleck, D. Heinemann, ForWind
- 6.2 Aggregation of Wind Power Generation: Relating the Accuracy of Total Wind Power Production to the Number of On-line Reporting Reference Sites**  
L. von Bremen, N. Saleck, J. Tambke, D. Heinemann, ForWind
- 6.3 Contribution of Wind Power to the electric power system in NE Brazil**  
G. J. de Almeida, CHESF, Brazil; R. R. B. de Aquino. UFPE, Brazil
- 6.4 Combined and Large-Area Short-Term Wind Forecasts for the Grid Integration of 50GW On- and Offshore Wind Power Capacity**  
J. Tambke, L. von Bremen, N. Saleck, U. Gräwe, ForWind; Carsten Poppinga, Deutsche WindGuard Consulting GmbH; Jörg-Olaf Wolff, Univ. of Oldenburg; John A.T. Bye, University of Melbourne, Australia
- 6.5 Negative Sequence Current Control of Grid-side Inverter for DFIG System**  
S.-H. Song, Kwangwoon University, Korea; B.-C. Jeong, LS Industrial Systems, Korea
- 6.6 EMTP Modeling and Experimental Validation of Inverter Control Strategy for DFIG System**  
S.-H. Song, Kwangwoon University; B.-C. Jeong, LS Industrial Systems

- 6.7 Strategies for Balancing Wind Power in Germany**  
B. Lange, F. Schlögl, R. Mackensen, Ü. Cali, R. Jursa, K. Rohrig, ISET e.V.
- 6.8 Online Monitoring in Germany**  
R. Mackensen, R. Jursa, F. Schlögl, B. Lange, K. Rohrig, ISET e.V.
- 6.9 Optimization of Wind-powered Industrial Processes on the Basis of Sea Water Desalination via Reverse Osmosis**  
J. Käufler, Synlift Systems; R. Pohl, Institute for Energy and Environment
- 6.10 The CEwind project - Shadow Flicker**  
H.-D. Freund, University of Applied Sciences Kiel
- 6.11 Verification of Shadow Flicker Models**  
A. Peel, W. Schlez, Garrad Hassan and Partners Ltd
- 6.12 The Status of Wind Energy in Nigeria and its Technology Overview**  
I. H. Zarma, Energy Commission of Nigeria, Nigeria
- 7 Offshore**
- 7.1 Typical Weather Situations and Their Estimated Frequency Causing High Load Alternations on Offshore Wind Turbines**  
S. Emeis, M. Türk, Forschungszentrum Karlsruhe GmbH
- 7.2 Neural Networks to Find Optimal NWP Combination for Offshore Wind Power Predictions**  
L. von Bremen, N. Saleck, J. Tambke, D. Heinemann, ForWind
- 7.3 Influence of Variation of Soil-properties on Static and Dynamic Behaviour of Offshore Wind Turbine Structures**  
D. Bringezu, H. Harder, Hochschule Bremen; H. Bellmer, Prof. Bellmer Ingenieurgruppe GmbH
- 7.4 Assessment of Mechanical Loads and Environmental Conditions for Extensive Aquaculture Constructions within Offshore Wind Farms: First Results from the AquaLast Study Site**  
O. Zielinski, R. Henkel, Bremerhaven Uni. of Applied

Sciences; J. Assheuer, Technologiekontor Bremerhaven GmbH; A. Berg-Pollack, Fraunhofer Center for Wind Energy and Maritime Engineering; B. H. Buck, M. Geisen, Alfred Wegener Inst. for Polar and Marine Research; D. Kassen, WeserWind GmbH

- 7.5 Reliable and Cost-effective Design for an Offshore Metmast**  
J. Bendfeld, M. Splett, J. Voss, University of Paderborn; A. Higgen, J. Krieger, Thales Instruments GmbH
- 7.6 Past climate and extreme events over North Sea**  
K. Suselj, V. Layec, A. Sood, L. von Bremen, Forwind
- 7.7 Three Years Operation of Far Offshore Measurements at FINO1**  
T. Neumann, K.Nolopp, DEW
- 7.8 Operation of Offshore Wind Farms: The FMEA Concept As a Tool for Preventive System and Failure Analysis**  
H. Albers, S. Greiner, Hochschule Bremen
- 7.9 Large-scale Laboratory Experiments on Breaking Wave Loads and Verification of the GL Wind 2005 Approach**  
K. Irschik, aerodyn Energiesysteme GmbH; H. Oumeraci, Leichtweiss-Inst. for Hydraulic Engineering

## 8 Monitoring

- 8.1 Model Based Imbalance Monitoring**  
R. Ramlau, Johann-Radon-Institut, Austria; J. Niebsch, Konrad-Zuse-Institut
- 8.2 Multibrid 5000 Power Performance – A Validation Exercise**  
T. Kramkowski, H. Mellinshoff, DEWI; F. Koch, Multibrid Entwicklungsgesellschaft mbH
- 8.3 Temperature Induced Drift in Mechanical Load Measurements on Wind Turbines**  
R. Klosse, H. Söker, DEWI