# Preliminary Program

(Version 1.3, 2003-08-06)

## Program Overview

<table>
<thead>
<tr>
<th>Sunday 19</th>
<th>Monday 20</th>
<th>Tuesday 21</th>
<th>Wednesday 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 9:00</td>
<td>Registration</td>
<td>9:00 - 10.30</td>
<td>Eltra Day</td>
</tr>
<tr>
<td>9:00 - 11.10</td>
<td>Welcome and Session 1: Danish Perspective</td>
<td>9:00 - 13:00</td>
<td>9:00 - 13:00</td>
</tr>
<tr>
<td>11:30 - 12.50</td>
<td>Session 2: World-Wide Experience</td>
<td>11:00 - 13.00</td>
<td>Eltra Presentations</td>
</tr>
<tr>
<td>13:00 - 14.00</td>
<td>Lunch</td>
<td>13:00 - 14.00</td>
<td>13:00 - 14.00</td>
</tr>
<tr>
<td>14:00 - 16.00</td>
<td>Session 3a: Energy Management</td>
<td>14:00 - 15.20</td>
<td>15:35 - 17.15</td>
</tr>
<tr>
<td>16:15 - 18.00</td>
<td>Session 4a: Power Quality</td>
<td>15:35 - 17.15</td>
<td>Sightseeing Flights</td>
</tr>
<tr>
<td>18:00 - 20:00</td>
<td>Registration &amp; Snack</td>
<td>15:35 - 17.15</td>
<td>Horns Rev Offshore Wind Farm</td>
</tr>
<tr>
<td>19:30</td>
<td>Dinner</td>
<td>19:30</td>
<td>19:30</td>
</tr>
</tbody>
</table>

## Eltra Presentations

- Session 5: Wind Turbine Modelling
- Session 6a: Grid Integration I
- Session 6b: System Operation
- Session 7: Grid Integration II
- Session 8: Modelling

## Activities

- Registration & Snack
- Dinner
- Sightseeing Flights

---

Fourth International Workshop on Large-Scale Integration of Wind Power and Transmission Networks for Offshore Wind farms

October 20-21, 2003

In Billund, Denmark
Sunday 19 October 2003
18:00-20:00 Registration & Snack

Monday 20 October 2003
8:00-9:00 Registration

9:00 - 9:10 Welcome and Introduction, Thomas Ackermann, KTH

9:10 - 9:20 Welcome from Eltra

9:20-11:10 Session 1:

9:20 - 10:40 Presentations: The Danish Perspective
(20 minutes each)

- **Impacts Of Large-Scale Wind Power On The Power Market**, Berit B. Kristoffersen, Bjarne Donslund, Peter Børre Eriksen, Eltra, Denmark;

- **Integration Of Wind Power In The Grid In Eastern Denmark**, C. Rasmussen, P. Jørgensen, J. Havsager Elkraft System, Denmark;

- **The Active And Reactive Power Control System For The Horns Rev Offshore Wind Farm And The Results Of Its Commissioning**, Peter Christiansen, Jesper R. Kristoffersen, Tech-wise A/S, Denmark.

- **Energy System Analysis of Large-Scale Integration of Wind Power**, Henrik Lund, Department of Development and Planning, Aalborg University, Denmark.

10:40 - 11:10 Discussions, Discussion leader: to be announced;

11:10 - 11:30 Coffee break

11:30-12:50 Session 2:

11.30-12.30 Presentations: Worldwide Experience
(20 minutes each)

- **Integration Of 6.000 MW Offshore Wind Energy In Dutch Electrical Grid**, J.W. Cleijne, C.P.J. Jansen, KEMA; J.G. Slookweg, W.L. Kling, Delft University of Technology, the Netherlands;

- **Offshore Wind Power In German Transmission Networks**, M. König, M. Luther, W. Winter, E.on, Germany;

- **Experience With Large Scale Integration Of Wind Power**, Herman Annendyck, Electric Power Research Institute (EPRD), USA.

12:30-12:50 Discussions, Discussion leader: to be announced;

13:00-14:00 Lunch
14:00-16:00 Parallel Session 3a

14.00 - 15.30 Presentations: **Energy Management**
(18 minutes each)

- **Simulation Model Including Stochastic Behaviour Of Wind Power**, Jens Pedersen, Peter Børre Eriksen, Eltra, Denmark;
- **Analysis Of Large Scale Integration Of Wind Power In Regional HV-Grids Using Probabilistic Power Flow**, Diedrichs, V., Wieben, E., Wilhelmshaven, Germany;
- **Dimensioning Of Wind Power Plants In Areas With Limited Transmission Capacity**, Julija Matevosyan, Royal Institute of Technology, Stockholm, Sweden;
- **Integration Of Large Offshore Wind Power Into Energy Supply**, B. Ernst, M. Hoppe-Klipper, K. Rohrig, Institute für Solare Energieversorgungstechnik, Kassel, Germany;
- **EMS Principals For Wind Power Plant Operation And Market Interaction**, Jörgen Svensson, Dept. of Industrial Electrical Engineering and Automation, Lund University, Sweden;

15:30-16:00 Discussions, Discussion leader: to be announced;

14:00-16:00 Parallel Session 3b

14.00 - 15.30 Presentations: **Offshore Wind Power**
(18 minutes each)

- **AC Cable Versus DC Cable Transmission For Offshore Wind Farms, A Study Case**, Kent Søbrink, Eltra, Dennis Woodford, Electranix and Régine Belhomme, Eric Joncquel, EDF, France;
- **Aspects Of Cabling In Offshore Windfarms**, Heinrich Brakelmann, University Duisburg-Essen, Germany;
- **System Approach On Designing An Offshore Windpower Grid Connection**, Dr. Juergen Bernauer, ABB Utilities, Mannheim, Germany; Kjell Eriksson, ABB Power Systems, Ludvika, Sweden; Ove Tollerz, ABB High Voltage Cables, Karlskrona, Sweden; Dorman Wensky, ABB Utilities, Manheim Germany;
- **Engineering Design And Integration Experience From Cape Wind 420 MW Offshore Wind Farm**, Jeff Smith, Bob Zavadil Electrotek Concepts, Inc. Knoxville, TN; Chris Bryan, CBX Energy Engineering Waterville, ME, USA;
- **Regulations To Award Concessions For Offshore Wind Power Plants**, Ole Langniss. Lund University Sweden and Poul-Erik Morthorst, Riso National Laboratory, Denmark.

15:30-16:00 Discussions, Discussion leader: to be announced;

16:00-16:15 Coffee break
16:15-18:00 Parallel Session 4a

16.15-17.35 Presentations: **Power Quality**
(20 minutes each)

- **Power Quality Responsibilities by Grid Impedance Assessment at a Wind Power Production**, by A. Morales, J.-C. Maun, Université Libre de Bruxelles - Service de Génie Electrique, Belgium;
- **An Enhanced Method For Determining The Power Quality In The Power**, Peter Axelberg, Unipower AB, Sweden;
- **Harmonics And Interharmonics Generated By Wind Energy Converters – Measurements And A Novel Modelling Approach In The Frequency Domain**, Saniter Christoph, Schulz Detlef, Hanitsch Rolf Technical University of Berlin, Institute of Energy and Automation Technology, Germany;
- **Windfarm Power Quality Monitoring And Output Comparison With EN50160**, Ivan Codd, ESB Networks, Dublin, Ireland.

17:35-18:00 Discussions, Discussion leader: John Eli Nielsen;

16:15-18:00 Parallel Session 4b

16.15-17.35 Presentations: **Prediction of Wind Power**
(20 minutes each)

- **The State-of-the-Art in Short-Term Prediction of Wind Power - From a Danish Perspective**, Gregor Giebel, George Karinotakis, Richard Brownsword, Risoe National Laboratory, Denmark;
- **Design Of A Control Algorithm For Wind Speed Prediction Purposes**, P. Flores, A. Tapia, G. Tapia, EUITI, San Sebastián, Spain;
- **Modeling, Simulation and Control of Large Wind Plants in Power Systems**, Lawrence E. Jones, Fabrice Hudry and Louis Signoretty, Alstrom EAI, USA & France.

17:35-18:00 Discussions, Discussion leader: to be announced;

19:30 Dinner
Tuesday 21 October 2003

09:00-10:30 Session 5

9:00-10.00 Presentations: **Wind Turbine Modelling**
(20 minutes each)

- *Dynamic Phasor Modelling Of The Doubly-Fed Induction Machine In Generator Operation*, Emmanuel Delaleau, Univ. Paris-sud, France and Aleksandar M. Stankovic, Boston, USA;
- *Direct Drive Synchronous Machine Models For Stability Assessment Of Wind Farms*, Markus Pöller and Sebastian Achilles, DlgSILENT GmbH, Germany;
- *Validation Of DFIG Model Using 1.5 MW Turbine For The Analysis Of Its Behaviour During Voltage Drops In The 110 KV Grid*, Jens Fortmann, REpower Systems AG, Rendsburg, Germany.

10.00-10.30 Discussions, Discussion Leader: *to be announced*

10:30-11:00 Coffee break

11:00-13:00 Parallel Session 6a

11.00-12.30 Presentations: **Grid Integration Issues I**
(18 minutes each)

- *Consideration Of System Requirements For Wind Farms During Grid Faults*, M.J.Lahtinen, A.R.Katančević, Fingrid Oyj, Finland;
- *Integration Of A 300 MW Wind Park At Fladen, Kattegatt, Into The Swedish 130 KV Grid*, Kjell Jonasson, Mats Carlson, Göteborg Energi AB, Sweden;
- *About Possibilities To Integrate Wind Farms Into Estonian Power System*, by Olev Liik, Mart Landsberg, Rein Oidram, Tallinn Technical University, Department of Electrical Power Engineering, Estonia;

12.30-13.00 Discussions, Discussion Leader: *to be announced*
11:00-12:50 Parallel Session 6b

11.00-12.20 Presentations: System Operation
(20 minutes each)

- Scheduling Of Wind Generation Resources And Their Impact On Power Grid Supplemental Energy And Regulation Reserves, Yuri V. Makarov, California Independent System Operator, USA;
- Two Wind Power Prognosis Criteria And Regulating Power Costs, C. S. Nielsen, Hans F. Ravn, Camilla Schaumburg-Müller, Informatics and Mathematical Modelling, Technical University of Denmark, Lyngby, Denmark;
- Utility Planning And Operational Security Standards And Their Applicability To Wind Based Power Sources, D. Bailey, F. Castro Sayas, K. Harmer, M. King, PB Power, UK;
- The Effect Of Large-Scale Wind Power To A Thermal System Operation, Hannele Holttinen, VTT Finland and Eltra.

12.20-12.50 Discussions, Discussion Leader: to be announced

13.00-14.00 Lunch

14:00-15:15 Session 7

14.00-15.00 Presentations: Grid Integration Issues II
(20 minutes each)

- Vestas Handles Grid Requirements: Advanced Control Strategy For Wind Turbines, Sigrid Bolik, Björn Andresen, John G. Nielsen, Jens Birk, Vestas Wind Systems, Denmark;
- Power System Dynamic Performance Improvements From Advanced Power Control Of Wind Turbine-Generators, Nicholas W. Miller, GE Power Systems, USA;

15.00-15.20 Discussions, Discussion Leader: Thomas Ackermann, KTH

15:20-15:35 Coffee break
15:35-17:15 Session 8

15.35-16.55 Presentations: Modelling
(20 minutes each)

- *Voltage Stability Of Large Power Networks With A Large Amount Of Wind Power*, Vladislav Akhmatov, ELTRA, Denmark;
- *Aggregated Wind Park Models For Analyzing Power System Dynamics*, Markus Pöller and Sebastian Achilles, DlgSILENT GmbH, Germany;
- *Modelling Of Wind Farms In PSS/E*, Steven Stapleton Power Technologies International Ltd, UK; Yuriy Kazachkov, Power Technologies Inc., USA.

16.55-17.15 Discussions, Discussion Leader: *to be announced*

17:15-17.20 **Closing Remarks**

Wednesday 22 October 2003 - “Eltra Day”

9:00 – 13:00 Eltra Presentations

13:00 – 14:00 Lunch

14:00 - ?? Sightseeing flights to Horns Rev Offshore Wind Farm (weather depending)