

# Wind Energy Fact Finding Mission to Denmark

October 29th to November 1st, 2007

A comprehensive update of the latest developments in off- and onshore wind energy

Visit Denmark, leading the world in wind energy technology where today wind power provides 20 % of Danish electricity supply.

Learn from over 20 years of wind farm experience and how to integrate large amount of wind power, targeting 50 % in 2025.

*Rethinking* ENERGY



[www.NewEnergyDenmark.org](http://www.NewEnergyDenmark.org)



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[www.hagerernst.com](http://www.hagerernst.com)

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## PROGRAM OVERVIEW

### Wind energy industry tour of Denmark

New Energy Denmark, in cooperation with The Danish Energy Authority and Risoe National Laboratory are proud to present to you a fact finding mission to Denmark.

See first hand State-of-the-Art wind facilities, off- and onshore wind farms and learn from more than 20 years of wind industry experience.

Today more than 20 % of all electricity supply in Denmark is produced by wind power. In some local networks the figure is even higher. The Danish grid is connected with that of neighboring countries and in peak production times supplies them with surplus wind generated electricity. In addition, Denmark has an substantial co-generation production, that together with wind power supports the reduced carbon dioxide electricity output.

Today, Denmark is working towards achieving a goal of 50

% of all electricity production to come from wind power. Learn more about this and related subjects by participating in this extensive program.

Gain valuable insight into the future of wind farms from the experts who have been leading the development of the world's wind technology.

The program takes you to Risoe National laboratory and offers an unique opportunity to participate in the Nordic Wind Power Conference. Here you will be able to learn about all the newest aspects of wind power integration and network with the conference participants.

In addition, you will meet many of the mayor players in the industry:

- Vestas
- LM Glasfiber
- Vattenfall
- DONG Energy
- MDB Offshore
- Ramboll Consultants
- EA Energy Analyses
- Danish Wind Industry Association

- Niras
- DNV
- Grontmij - Carl Bro
- Orbicon

The program presentations gives an exclusive view of the new and impending developments of the industry.

We provide a guided package tour in Denmark, sharing experiences in :

- Turbine design and testing
- Power system integration and Grid connectivity
- Foundation design
- Environmental impact studies
- Wind farm planning and implementation

The majority of the program occurs in Copenhagen — an accessible, unique, and exciting European capital with a trip to various energy related sights on the west coast of Denmark, also included in the program.

Copenhagen: Canal Tours



photo: Cees van Roeden

Copenhagen: Café Europa



photo: Christian Alsing

The world's longest blade, the 61.5 meter LM 61.5P is being mounted to a 5MW turbine



photo: LM Glasfiber

# PROGRAM SCHEDULE

OCTOBER 29th - NOVEMBER 1st, 2007

## Monday October 29

### Morning

- Registration, welcoming remarks, program overview and introduction at the Danish Energy Authority
- Introduction to Danish renewable energy policy with focus on wind energy and 50 % wind energy provisioning in Denmark by the Danish Energy Authority
- Analyses: the role of offshore in the future planning
- Introduction to 'Project Megawind' - new developments in the application of wind technology

### Lunch

### Afternoon

- Wind energy in the future and update on environmental impact and planning
- Latest development in how to plan a wind farm on land and at sea by the Danish Energy Authority
- Development and ownership of offshore wind parks
- Update on Danish test result for the impact on ecology and marine life
- Case studies presented by two developers on environmental impact and wind farm planning

### Transfer to Odense

## Tuesday October 30

### Morning

- Visit to the Danish State utility and grid operator
- Learn about how to control the requirements from the fluctuations in wind power
- Case study: software solutions for the control of a local grid
- Case study: how to engage the consumer -examples of pricing techniques, messaging services and energy forecasting

### Lunch

### Afternoon

- Visit to turbine and blade manufacturers and gain first hand knowledge of new developments in the industry



Middelgrunden will be visited on the third day of the tour. Middelgrunden is an offshore wind farm that has community based ownership. It is situated just outside Copenhagen's main harbor.

## Wednesday October 31

### Morning

- Introduction to offshore foundation design and maintenance by several engineering and design consultants
- Case study: how to plan and maintain an offshore wind farm, presented by Denmark's leading Offshore consultants

### Lunch

### Afternoon

- Boat tour to Middelgrunden Offshore Wind farm (community based ownership) just outside Copenhagen's main harbor, including Q&A

### Lodging in Copenhagen



photo: Odense City Museum

We will visit the city of Odense, where the house of the famous Danish writer Hans Christian Andersen is located



photo: Tivoli Gardens

On the last day of the tour dinner will be held in one of the many restaurants in Tivoli Gardens in Copenhagen. Tivoli is one of the oldest tourist attractions in the world and served as an inspiration to Walt Disney when he founded Disneyland.

## Thursday November 1

### Morning

### Visit to Risoe Nordic Wind Power Conference

Opening Session with chair Henrik Bindner, Senior Scientist, Risoe.

#### Presentations:

- Nordic Energy research Today
- Wind Power Development in Denmark
- The future Power System – Ecogrid, Energinet.dk
- Power System Network issues
- Performance of Automatic Generation Control Mechanisms with large scale wind power
- Integration of large scale offshore windpower in the Norwegian power system
- 50 % wind power in Denmark, a plan for establishing the necessary electrical infrastructure
- The influence of Different Control strategies in wind turbines with dual fed induction generators on stability studies
- Long term voltage stability study

### Visit to Risoe national testing station for wind turbines

### Lunch

### Afternoon

- Special program by Risoe, including Q&A
- Presentation: Update on testing and the cooperation with NREL

Transportation provided to Cph Central Rail Station for evening program

### Evening

Dinner in Tivoli Gardens

Conclusion of Program

## PROGRAM HIGHLIGHTS

- Explore the Danish wind turbine industry, learn from the experiences gained and the future of wind.
- Visit research facilities, turbine manufacturers and wind farm planners, get first hand knowledge of the off- and on-shore technology and planning methodology
- Experience and learn about off-shore wind parks, foundation design and environmental impact analysis
- Learn about new developments in grid, pricing and connectivity technology
- Enjoy Copenhagen, its art, food, culture, historic city center, famous walking streets, shopping and Tivoli Gardens, the famous "leisure park". Program for spouses or partners is available upon request.

### WHO SHOULD ATTEND

This seminar will explore the Danish wind energy industry both off- and onshore and its state of the art research facilities.

It is designed for wind energy professionals or those who intend to become one. Target groups are developers, utilities, government and energy department officials, wind farm consultants, researchers, university professors & instructors and NGO's / representatives from energy related organizations.

### PROGRAM LOCATION

The program starts and concludes in Copenhagen, the capital of Denmark, Scandinavia's most dynamic city. Copenhagen can be reached easily by air.

Copenhagen Airport (CPH), rated the Best Airport in the World in 2002, is the major airport for Northern Europe and offers direct flights to 118 destinations around the world. It is just a 12-minute train journey to Central Station (København H in Danish). Taxis are also available.

In advance of the program you will receive information about getting to and enjoying Copenhagen. Transfer will be provided to the visit to the West coast of Denmark for days 2 and 3 of the program.

### PROGRAM LODGING

We have reserved lodging in Central Copenhagen for two nights and two nights in Odense. Both hotels offer private bathrooms and are centrally located within the cities. In Copenhagen you are close to the central train station, SAS-Terminal, Town Hall Square, and the Tivoli Gardens.



Vestas wind turbine mounting



The world's largest testing station for blades is located at LM Glasfiber. Blades up to 80 m are tested at the station.

## HOW TO JOIN

### CONTACTS:

#### Information:

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#### Registration:

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fax: +45 87 44 11 59 (att: Skovbakke)

### PROGRAM STAFF

New EnergyDenmark.org  
HagerErnst LLC  
Cultours.dk

### REGISTRATION

Program Fee Includes:

- Four nights lodging
- All breakfasts
- All lunch Monday to Thursday
- All transportation in Denmark commencing with the event
- Program sessions incl. Nov. 1 participation at the Risoe Nordic Wind Power Conference
- All program tours to energy sights
- All materials and documentation during the stay in Denmark. Airfare to Copenhagen and ground transportation to and from Copenhagen Airport are not included in the program fee.

#### Per Person Program Fee:

with lodging USD 2,175  
Government officials and NGO's receive a 15 % discount, registration deadline Oct. 1.

### PRINTABLE REGISTRATION FORM

Please download the registration form at [www.newenergydenmark.org](http://www.newenergydenmark.org)

### SPOUSES PROGRAM

Please indicate in the registration form if you are interested in a program for spouses.

### FRIDAY, NOVEMBER 2, 2007

In addition to the program October 29th - November 1st, you can sign up to participate in the second part of the Risoe Nordic Power Conference or we can provide assistance for setting up meetings or sightseeing in Copenhagen.

### • Registration deadline is October 1st, 2007

Register by email, by fax or by telephone, using VISA or MasterCard.

### WITHDRAWAL

If you withdraw in writing within 10 days of registration you will receive a full refund.

In the event a withdrawal is necessary after October 10th, 2007, there will be no refund but you may substitute another person to attend the program in your place.

We highly recommend you purchase travel cancellation insurance (and confirm what it may cover). Useful travel insurance information can be found at [www.TripInsuranceStore.com](http://www.TripInsuranceStore.com) or 1 888-407-3854. You may also wish to check with your local travel agency for recommended sources. There will be no refund for unused portions of the program, including but not limited to, missed meals, hotel nights, and sightseeing.

