



# **IEA Wind Roadmap: Comments from the IEA Wind Implementing Agreement**

**Presented by Hugo Chandler for  
Brian Smith, Chair – IEA Wind  
IEA Experts Group on R&D Priority  
Setting and Evaluation  
Paris, France  
November 2-3, 2009**



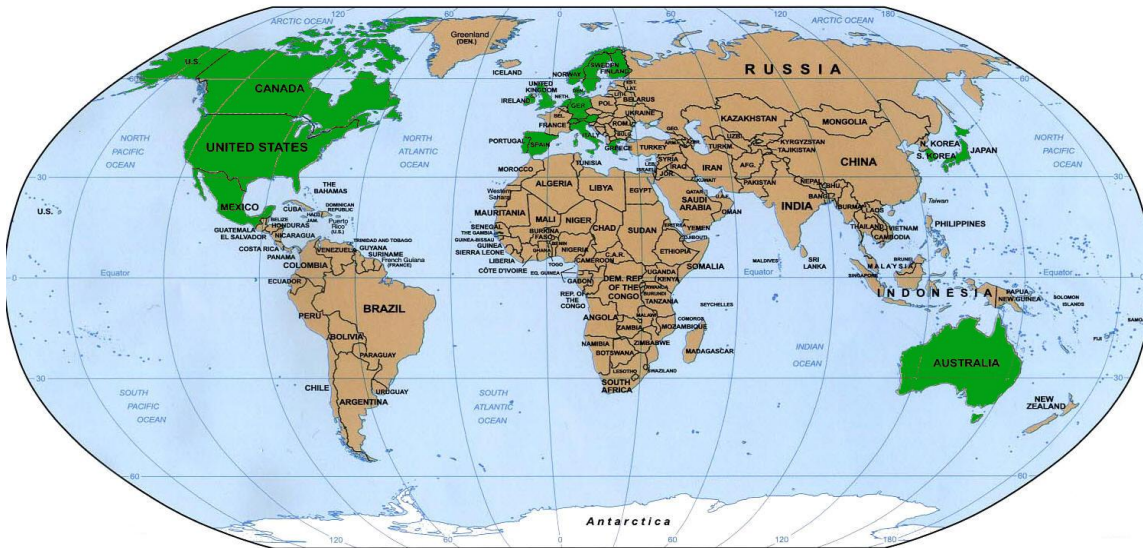
# Mission of IEA Wind

“...to stimulate co-operation on wind energy research and development and to provide high quality information and analysis to member governments and commercial sector leaders by addressing technology development and deployment and its benefits, markets, and policy instruments.” – IEA Wind Strategic Plan

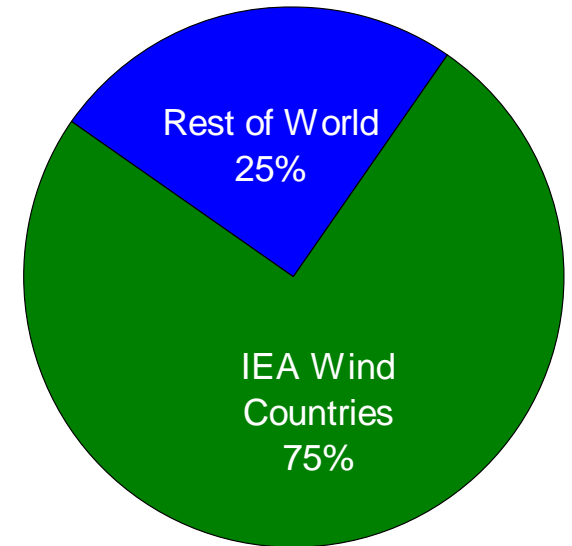


iea wind

# 75% of the world wind capacity is in IEA Wind member countries



IEA Wind Countries



World Wind Capacity



# Data for IEA Wind

**Table 1 Key Statistics of IEA Wind Member Countries 2008**

	2007	2008
Total installed capacity	74.84 GW	91.77 GW
Total offshore wind capacity	1,125 MW	1,431 MW
Total new wind capacity installed	13,315 MW	17,000 MW
Annual increase in capacity from previous year	21%	23%
Total annual output from wind	155 TWh/yr	194 TWh/yr
Wind generation as % of national electric demand	1.6%	2.3%





# IEA Wind has broad membership

## OECD Participating Countries

:

Austria, Denmark, Finland, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the European Commission.

At ExCo 63, Russia was invited to join.

:

Canada, Mexico, and the United States.

:

Australia, Japan, and South Korea.

At ExCo 64, November 3 IEA Wind will invite India to attend the next meeting as a prelude to joining.

## International Organizations (sponsors)

European Wind Energy Association





# IEA Wind Roadmap – Contributions from Wind IA

- Wind IA represented by Ian Baring Gould (Task 19 participant) at 1<sup>st</sup> Wind Roadmap Workshop focused on technology (March 2009).
- Wind IA represented by Felix Avia (Operating Agent for Task 11) at 2<sup>nd</sup> Wind Roadmap Workshop focused on deployment and policy (June 2009).
- Wind IA members submitted detailed comments on draft Roadmap in late August 2009.
- The IEA Wind End of Term Report and Strategic Plan were also sent to Wind Roadmap authors for reference.
- Current version of Wind Roadmap incorporates Wind IA comments.
- Wind IA perspectives presented by Hugo Chandler at IEA CERT Workshop on behalf of IEA Wind on November 2, 2009.



# IEA Wind Strategic Plan is well aligned with Wind Roadmap

## *Priorities from IEA Wind Strategic Plan for 2009-2013*

1. Wind Technology Research to Improve Performance and Reliability at Competitive Costs
2. Power System Operation and Grid Integration of High Amounts of Wind Generation Including Development of Fully controllable, Grid-friendly “Wind Power Plants”
3. Planning and Performance Assessment Methods for Large Wind Integration
4. Offshore Wind in Shallow and Deep Waters
5. Social, Educational, and Environmental Issues



# IEA Wind supports national programs with information exchange and joint R&D

## Information Exchange

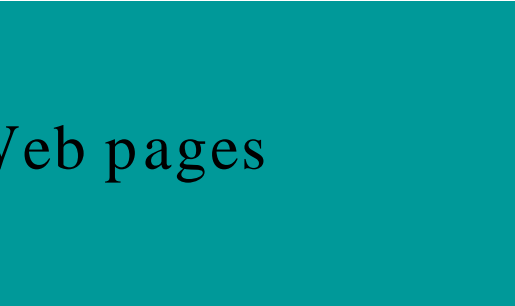
- Planning and execution of large-scale wind energy deployment
- Tariffs, permits, credits, certificates, mandates, and other incentive and regulatory environments
- Integration with electrical grids
- Experiences with national technology research projects

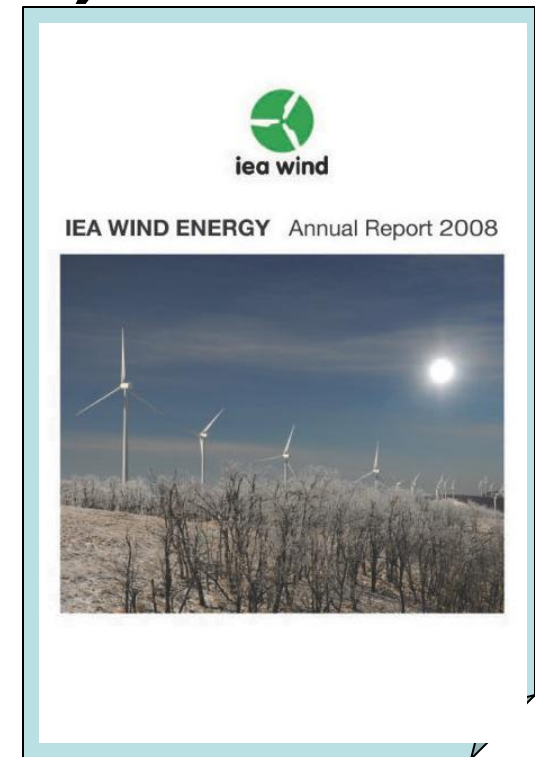






# Information Exchange (cont.):

- Country and Task reports at meetings of the IEA Wind Executive Committee (2 times per year, 20 countries, the European Commission, and the European Wind Energy Association)
- IEA Wind Annual Report (315 pages) containing country and research Task chapters and Executive Summary is distributed to all participating organisations
- Final reports for research Tasks
- Public Web site: 
- Members-only Web pages





# Topical Experts Meetings:

- Remote wind speed sensing techniques using SODAR and LIDAR
  - 31 people from 11 countries
- Sound propagation models and validation
  - 17 people from 9 countries
- Wind turbine drivetrain dynamics and reliability
  - 47 people from 9 countries
- Application of smart structures for large wind turbine rotor blades
  - 22 people from 7 countries
- Long-term research needs for wind energy
- Social acceptance of wind energy projects
- Wind and wave measurements at offshore locations
- Radar, radio, and wind turbines
- Social acceptance of wind energy projects
- Periodic symposia on aerodynamics, fatigue, wind characteristics, and forecasting
- New IEA Wind Recommended Practices under consideration: SODAR and LIDAR; noise measurement immission; cost of wind energy; small wind turbine labeling



# Four New Tasks Address Key Issues

- Cost of wind energy (Task 26)
  - Bring economists and engineers together
- Consumer labels for small wind turbines (Task 27)
  - Bring IEC standards and test practices together
  - Produce a recommended practice for quality labeling of small wind systems
- Social acceptance of wind energy projects (Task 28)
  - Bring social scientists, planners, and project developers together
- MexNex(T): Analysis of wind tunnel measurements and improvement of aerodynamic models (Task 29)
  - Bring aerodynamic experts together



# 9 Active IEA Wind Research Tasks

- Task 29 Aerodynamic Analysis of Data from the EU MEXICO Project
- Task 28 Social Acceptance of Wind Energy Projects
- Task 27 Consumer Labeling of Small Wind Turbines
- Task 26 Cost of Wind Energy
- Task 25 Power Systems with Large Amounts of Wind Power
- Task 24 Integration of Wind and Hydropower Systems
- Task 23 Offshore Wind Technology and Deployment
- Task 19 Wind Energy in Cold Climates
- Task 11 Base Technology Information Exchange





# Final thoughts on Wind Roadmap

- Wind IA fully supports the development of the Wind Roadmap to unify international efforts
- Current Wind IA activities and five-year strategy are well-aligned with Roadmap
- Wind Executive Committee will discuss its specific role in Roadmap implementation and further alignment of long-term strategy
- Recommend that IEA develop a “report card” for the Roadmap to track annual progress toward timeline and targets

For more information on IEA Wind, visit  
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# IEA Disclaimer

The IEA Wind agreement, also known as the Implementing Agreement for Co-operation in the Research, Development, and Deployment of Wind Energy Systems, functions within a framework created by the International Energy Agency (IEA). Views, findings, and publications of IEA Wind do not necessarily represent the views or policies of the IEA Secretariat or of all its individual member countries.

# BACK UP SLIDES





# Task 19 addresses cold climate issues for wind energy

- Experts Recommendations report 2009.
- State-of-the-art Report 2009
- Final Report and extension of work through 2012



# Task 23 explored issues of offshore wind development

- Workshops on regulation, grid connection, and ecological issues
- Technical research for deeper water
- New Task 30 proposal on systems for deep water to be considered at ExCo 64



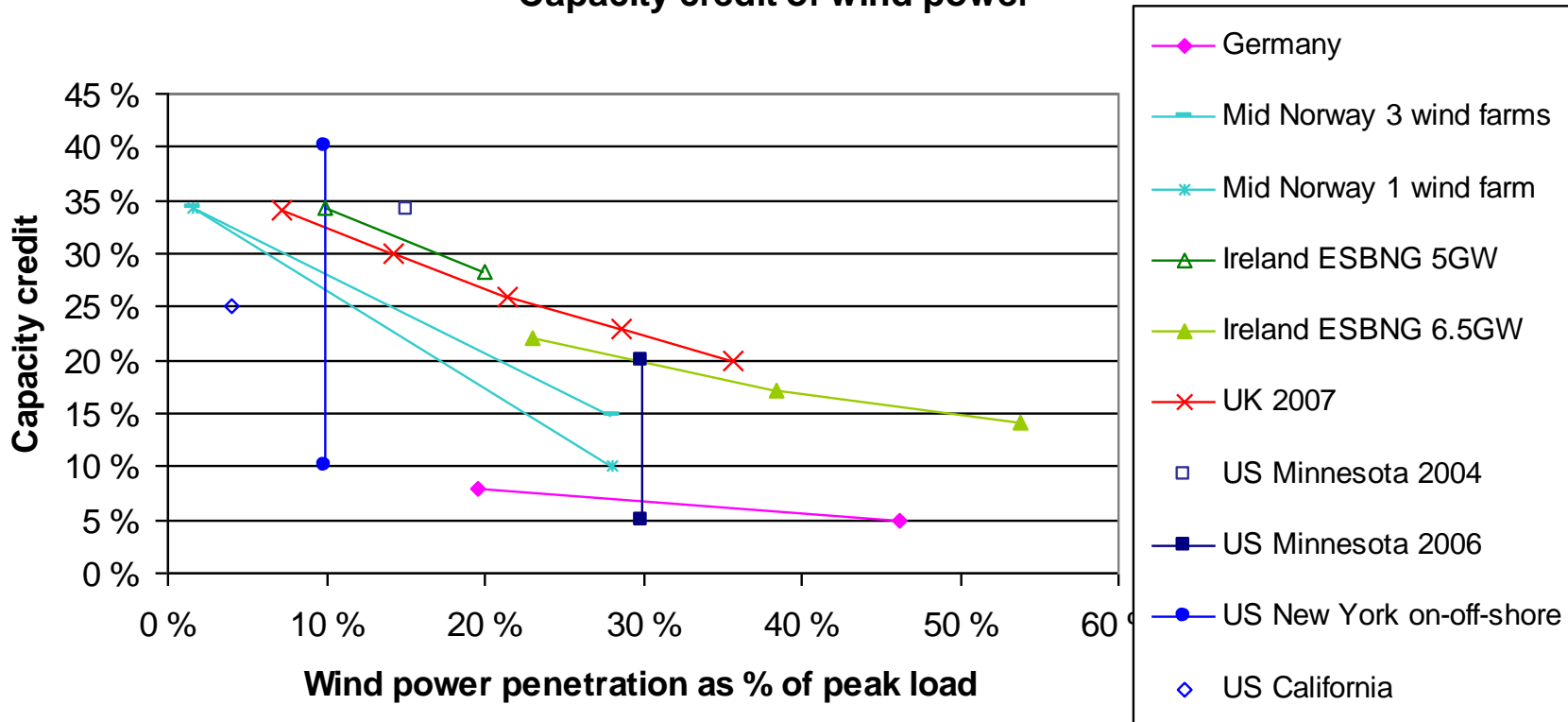
The Lillgrund Wind Power Farm 2007-11-02

Photo: Hans Blomberg +46 70 550 0121

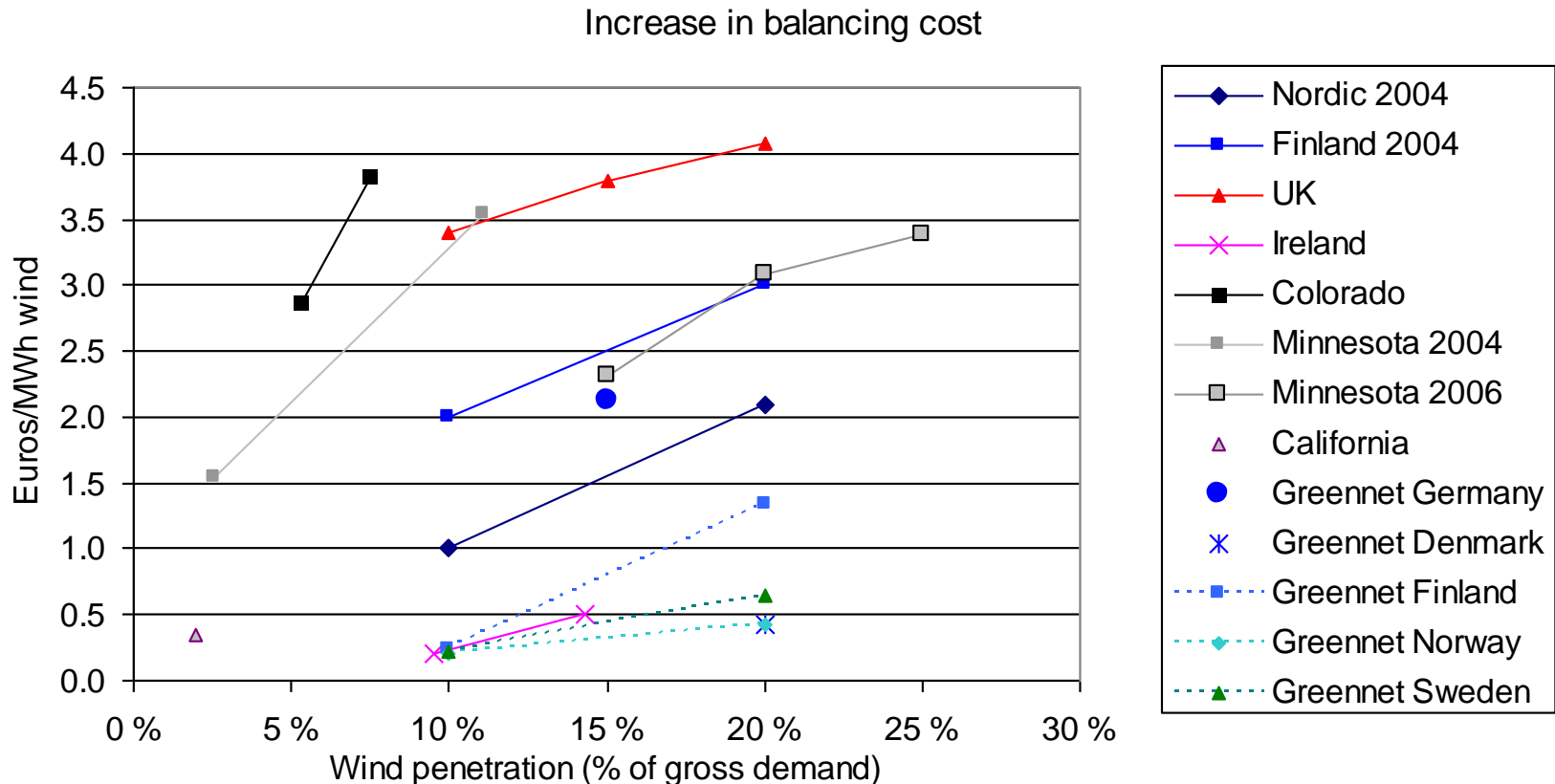
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# State-of-the-art report on integration (Task 25)

Capacity credit of wind power



# More state-of-the-art report



# Aerodynamic research

- Task 29 will analyse wind tunnel measurements and improve aerodynamic models
  - Using measurements of a wind turbine in the large German Dutch Wind Tunnel, DNW
  - Measurements are available from EU-funded project *Measurements and Experiments in Controlled Conditions, MEXICO*

