

**MEMORANDUM OF UNDERSTANDING  
For The  
Collaboration on Research of Renewable Energy Resources  
Between**



**National Renewable Energy Laboratory**

**Managed and Operated for the United States Department of Energy  
by Midwest Research Institute**

**And**



**Risø National Laboratory · Technical University of Denmark – DTU**

**Denmark**

## **Introduction**

Risø National Laboratory (Risø) and the National Renewable Energy Laboratory (NREL) (hereafter "Participants") have conducted renewable energy research with a focus on wind energy for many years. They have cooperated informally by exchanging professionals and invitations to hosted events of mutual interest. The Participant's goals historically overlapped in areas such as rotor aerodynamics, structural dynamics, power conversion technology and atmospheric fluid mechanics. In recent years, Risø has focused on offshore wind energy, which has introduced a new spectrum of technical challenges. NREL has also begun to focus research on offshore wind energy as it applies to the unique offshore conditions presented by the United States Outer Continental Shelf (OCS). While Danish offshore is shallow, the OCS is deeper and presents unique weather conditions that must be included in the design basis for safe operation. As wind energy development expands to high penetration, utility integration has become an important issue. Denmark's already high penetration has demonstrated remarkable success. The United States grid has unique characteristics and different challenges that must be met before high penetration levels can be reached. Research into all these areas is of mutual interest to the Participants.

This Memorandum of Understanding (MOU) between Risø and NREL formalizes the intent to collaborate to maximize the benefit of their respective research interests

## **Section I: Authority, Organization and Mission**

### **1. Authority**

- a. NREL is a Federally Funded Research and Development Center (FFRDC) managed and operated by Midwest Research Institute for the United States Department of Energy under Contract No. DE-AC36-99GO10337. NREL's participation in the collaborative activities under this MOU is in accordance with the terms of the DOE contract and the DOE FFRDC sponsoring agreement.
- b. On 1 January 2007, Risø National Laboratory, the Danish Institute for Food and Veterinary Research, the Danish Institute for Fisheries Research, the Danish National Space Center and the Danish Transport Research Institute have merged with the Technical University of Denmark (DTU) with DTU as the continuing unit.

### **2. Organization and Mission**

NREL's mission is to enhance energy efficiency and the production of renewable energy to bring clean, reliable and affordable energy technologies to the marketplace. NREL has active programs in solar energy, wind energy, ocean energy, biomass, geothermal energy, utility integration, transportation systems, and energy efficiency.

Within the Technical University of Denmark (DTU), Risø is a national laboratory operating large facilities in technical sciences. Also Risø carries research obligations within specific energy fields such as wind energy, biomass, solar energy, energy consumption, integration of renewable energy resources into energy systems and electrical grids.

Risø carries out scientific and technical-scientific research that can provide Danish society with new opportunities for technological development and takes responsibility for the results to be used. Large test facilities and interdisciplinary research environments enable Risø to

solve problems across traditional professional boundaries and competences. Training and education as well as innovative activities are naturally integrated with Risø's research activities. Research is furthermore the basis of customer-driven activities including advice to the business community, institutions and authorities.

## **Section II: Scope and Objective**

The scope of this MOU is intended to focus on wind energy. Additionally, an emphasis will be placed on exploring opportunities for collaboration on energy efficiency technologies. This MOU sets the basis for collaboration. If the Participants agree to undertake joint projects with defined specific projects and goals, they intend to develop a separate written agreement for each project setting out each party's contribution, deliverables, responsibilities, and intellectual property rights and obligations.

## **Section III: Collaborative Activities**

Collaborative activities under this MOU may include, but are not limited to, activities in the scientific and technical areas of mutual interest as described in Section II. The initial area of focus is wind energy, which includes the following areas of mutual interest and past informal collaboration:

1. Meteorology
2. Aerodynamics
3. Rotor structure and materials
4. Foundation and support structures
5. Control systems
6. Remote sensing
7. Structural health monitoring technology
8. Atmospheric flow and array interactions
9. Electrical grid integration
10. Offshore wind energy

Other areas of collaboration may include all of the technology areas of renewable energy and energy efficiency.

In all areas of potential interest, the parties will encourage the exchange of PhD students, post docs and other scientists as a high priority and an efficient means of developing the collaboration.

## **Section IV: Source of Funding**

1. Funding for any collaborative activities agreed upon will be subject to the funds and staff available to the Participants. Each Participant will cover its own costs. In the event that special funding is available for selected projects, the Participants will develop a separate written agreement for such projects. In such cases, the terms of funding will be agreed by both Participants before the commencement of activities and will be described in a separate written agreement pursuant to Section VIII below.
2. The Participants shall bear their own expenses for collaboration under this MOU including all administrative costs, overhead expenses, labor costs, insurance costs, travel expenses and similar costs, unless a separate agreement between the Participants provides otherwise.

## **Section V: Reports, Documents and Release of Information**

1. Each party intends to collaborate in a manner that facilitates exchanges of nonproprietary information. Subject to applicable laws and regulations, the Participants intend that information, data and reports of collaborative activities carried out under this MOU may be released by either Participant with the written concurrence of the other Participant.
2. Activities that may involve sharing of proprietary information and transfer of rights and interest in intellectual property are excluded from the purview of this MOU. In the event it becomes necessary to share proprietary information, separate nondisclosure agreements will be put in place.

## **Section VI: Review of Activities**

The Participants shall review collaborations established under this MOU as a means to ascertain their effectiveness, to recognize cognate technical personnel, and to identify promising areas for future collaboration. This review shall take the form of annual meetings of key technical contacts and management from each Participant to discuss ongoing and future cooperation. Specific commitments developed pursuant to this MOU will be reflected in separate written agreements in accordance with Section VIII below.

## **Section VII: Separate Written Agreements**

Specific activities derived from the collaborative activities under this MOU, including as appropriate details concerning financial arrangements and the allocation and protection of property rights, including intellectual property rights, will be confirmed in a separate written agreement between Participants. Such separate written agreement will set forth as appropriate a work plan, staffing requirements, cost estimates, funding sources, a plan for the adequate and effective protection of intellectual property rights and other arrangements or conditions that are not within the purview of this MOU.

## **Section VIII: Status of the Memorandum of Understanding**

This MOU is not intended to create obligations binding under national or international law. The Participants do not intend, or expect, to create intellectual property under this MOU. If it appears that activities under this MOU may result in the creation of intellectual property, the Participants will enter into a separate written agreement or will redesign the program to avoid the creation of intellectual property.

## **Section IX: Contacts and Amendments**

1. All notices, communications and coordination shall involve, at a minimum, the following individuals, their successors and/or designees as follows:
  - a. For the National Renewable Energy Laboratory:  
Dan Arvizu, Laboratory Director  
1617 Cole Boulevard  
Golden, Co 80401  
Tel: 1 303 275 3016

b. For the Risø National Laboratory · Technical University of Denmark:  
Jorgen Kjems, Managing Director  
Frederiksborgvej 399 · P.O. 49 ·  
DK-4000 Roskilde  
Tel: +45 4677 4600

2. The Participants recognize that implementation of the MOU will require an ongoing dialogue between the Participants and, accordingly, expect to make future modifications and amendments to the MOU as technologies, policies and program goals change over time.

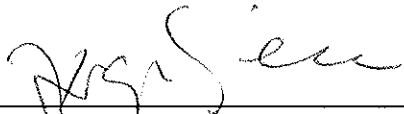
#### **Section X: Effective Date, Amendment and Termination**

This agreement shall be effective on the later date of the Participants' signatures. It shall continue in effect for a period of five (5) years, or until it is terminated, upon written agreement between the Participants, or by either party upon 90 days written notice to the other. It may be amended or extended upon written agreement of the Participants.

#### **Section XI: Miscellaneous**

1. This MOU in no way restricts either of the Participants from participating in any activity with any other public or private organization.
2. This MOU is neither a fiscal nor a funds obligation document. Nothing in this MOU authorizes or is intended to obligate the Participants to expend, exchange, or reimburse funds, services, or supplies or transfer or receive anything of value.
3. This MOU is strictly for internal management purposes for each of the Participants. It is not legally enforceable and shall not be construed to create any legal obligation on the part of either party. This MOU shall not be construed to provide a private right or cause of action for or by any person or entity.

**FOR THE PARTICIPANTS**



Dr. Jørgen Kjems  
Managing Director  
Risø National Laboratory  
Technical University of Denmark

Date: 27/08-07



Dr. Dan E. Arvizu  
Director  
National Renewable Energy Laboratory  
Managed and operated for the United States Department of Energy  
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Date: 27/06-07