



Wind Energy Program Technology Portfolio

Low Wind Speed Technology Phase II: Offshore Floating Wind Turbine Concepts: Fully Coupled Dynamic Response Simulations

Massachusetts Institute of Technology

Project Description: Floating wind energy systems have emerged as a promising technology for the utilization of offshore wind resources for large-scale electricity generation near major load centers. Drawing upon the maturity of wind turbine technologies as well as floater technologies developed by the oil and gas industry, wind turbine manufacturers are developing multimewatt systems for offshore operation.

This study employs dynamic response simulations to evaluate at least two floating platform concepts for offshore wind turbines deployed in water depths between 50 and 200 meters, a moored spar buoy and a tension leg buoy. One component of this study is the selection of wind turbine, floater, mooring system, and foundation configurations based on considerations of reliability and economy. A second component is to propose standard theoretical and experimental methods for designing floating wind turbines for operation over extended periods in severe offshore environments. These methods will address stability issues that arise from combined turbulent wind and random wave loading.

Project Type: Conceptual Design Study
Total Project Budget: \$178,920
Industry Cost Share: \$0
DOE Cost Share: \$178,920
Planned Project Duration: August 2004–February 2006

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Current Status: Project Underway



Floating platform concept illustration/simulation.

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