

## **ENVIRONMENTAL STUDIES PROGRAM: Studies Development Plan FY 2009-2011**

**Region:** Gulf of Mexico

**Planning Area(s):** North Atlantic, Mid-Atlantic, South Atlantic, Straits of Florida, Washington/Oregon, Northern California, Central California, Southern California

**Title:** Energy Market and Infrastructure Information for Evaluating Alternative Energy Projects for OCS Atlantic and Pacific Regions

**MMS Information Need(s) to be Addressed:** The Energy Policy Act of 2005 grants Minerals Management Service (MMS) responsibilities over alternative energy and related-uses of the Federal OCS. The MMS Office of Alternative Energy Programs (OAEP) addresses the management of this emerging industry. This study will support the OAEP effort by providing insights into the types and scale of alternative-energy-related activities likely to occur in the next five to 10 years, and by providing information and analyses in support of the assessment of these concerns and effects. The study addresses new and pressing information needs, and supports development of longer-range strategies for managing this rapidly evolving industry.

**Cost Range:** (in thousands) \$400-\$500

**Period of Performance:** 2008-2010

### **Description:**

**Background:** The Energy Policy Act of 2005 grants MMS new responsibilities over Federal offshore alternative energy and related-uses of the OCS. The MMS has established the Office of Alternative Energy Programs (OAEP) within the Bureau to address the management of this emerging industry. The Energy Policy Act adds considerably to the breadth of MMS responsibilities. Alternative energy projects link to an electricity market that is very different from the petroleum-based industry MMS currently manages. These projects will also have very different environmental and operational needs than do offshore petroleum projects, and early ones—at least—are likely to occur in OCS-planning areas where MMS is not now active. Finally, the alternative energy industry is rapidly evolving in the face of changing energy markets, technologies, and governmental policies. The characteristics of OCS energy projects that will prove economically viable over the next decades are far from obvious. For example, oceans may be the best source for wave and current energy, but wind is of greatest interest today because of its proven technology, not because the OCS is the most convenient or economic source for wind.

Planning for this future cannot be based on past experience alone, while limited ocean-based alternative energy development has occurred, particularly in Europe, it has concentrated on wind power. Moreover, the U.S. OCS represents a frontier area for alternative energy operations, holding much promise but providing little by way of actual experience. Energy markets and

related infrastructure form one part of the equation that determines which OCS projects might prove economic. Energy markets in the Atlantic and Pacific Regions derive electricity from multiple sources and this complex energy mix is made up of numerous utilities in conjunction with large grid operators. The MMS and other stakeholders need a clear picture of the operations and economics of energy markets and technology generally (e.g., of the competition, trading, power purchase agreements, capacity losses, energy efficiencies, and other factors that determine this market), as well as an understanding of the energy market for the Atlantic and Pacific Regions (e.g., the energy mix, its market trends).

The alternative energy industry is the second part of the equation. The basic physical and technological requirements for wind, wave and current energy generation differ, as does the state of their technological “readiness” for OCS applications. To plan for what is foreseeable, likely, and possible in the short- and longer-term, MMS and other stakeholders need a clear picture, for each source of energy, of the factors that make offshore energy generation economic (or not), the physical and technological challenges to the economic generation of offshore energy, and likely future solutions (if any) to these identified challenges. This picture of economic possibilities would have to consider government policies that benefit offshore projects or shape the energy markets.

MMS faces particular challenges in addressing the range of information required to assess socioeconomic effects of alternative energy projects. First, the bureau faces a rapidly changing industry with limited experience; the identification of data both relevant and available may be difficult in some cases. Second, based on current expressions of industry interests, MMS expects that most (or all) alternative energy activities will focus on portions of the Atlantic and northern Pacific. These are “frontier areas.” The communities that would host these activities have had little or no experience with any offshore, energy-related industrial activities. Because of the high level of interest in pursuing alternative energy development on the OCS, MMS and other stakeholders need an effort in place to identify, collect and assess information and geospatial data that are germane to analyzing the socioeconomic consequences of OCS alternative energy project scenarios (e.g., a range of likely types, sizes, and locations of projects) in areas that will most likely host such developments.

**Objectives:** The intent is to provide analytical and informational support to MMS and other stakeholders for the assessment of the likely types and magnitudes of alternative energy developments on the Nation’s OCS over the next five- and 10-year horizons. Study objectives are to:

Provide an overview (or primer) on energy markets and how they work (e.g., energy mix, competition, trading, power purchase agreements, capacity losses, energy efficiencies, and other factors that determine this market, energy grid operations, DC to AC inverters, substations).

Describe likely support infrastructure needs that are specific to OCS alternative energy development, including such components as substations and transmission lines, ports, relevant manufacturing capabilities, shipyards and shipbuilding, and transportation of components. Support infrastructure in coastal communities is the backbone of offshore oil and gas energy development. A study sponsored by MMS (The Louis Berger Group, Inc., 2004) that surveyed a wide range of such onshore infrastructure in the Gulf of Mexico has proved invaluable for the Gulf of Mexico NEPA

analysis. The Berger study can serve as a pattern for the infrastructure aspects of this study of alternative energy.

For wind, wave and current energy, assess the current state of technology, the factors limiting economic application to the OCS, and foreseeable solutions. This should include descriptions of what projects might be like that could operate economically.

For those areas likely to host OCS alternative energy projects, identify the socioeconomic issues and effects of concern and collect and systematize information to support an assessment of those effects.

Methods: The study will synthesize literature (including completed and ongoing MMS studies), information on existing projects in other countries, and expert advice to develop general and regional descriptions of energy markets and the offshore energy industry. The assessment of available and possible technologies will include “engineering snapshots”—or a physical picture of what projects would be like to achieve profitability. To the extent warranted by existing information, the analysis of project descriptions shall address different capital input options, where the capital equipment is produced and its costs, and the amount of labor and types of labor skills required for project construction, operation, and decommissioning. The study shall identify and assemble a wide range of data in support of assessments. Geospatial data shall meet MMS geospatial specifications. Many data types to be synthesized are known but will be shaped by the nature of alternative energy projects and/or by local conditions, such as data on local land use (including coasts and oceans) and infrastructure. Many information types to be collected have yet to be identified. MMS management responsibilities widen as the Bureau becomes the lead authority for alternative energy projects. The Bureau will face many new and complex community stakeholder issues that will involve defining, researching, and recommending solutions or mitigation. Thus, some of the information sought by this study may be identified through interactions with state, community stakeholders, and other knowledgeable individuals.

**Revised Date:** April 16, 2008