New Energy Frontier

Balancing Energy Development on Federal Lands

A Joint Report to Congress on
Siting Energy Development Projects on Federal Lands

U.S. Department of the Interior
U.S. Department of Agriculture

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1.0 Executive Summary

This report responds to the direction of Congress as provided in the Statement of Managers (Rept. 111-316) accompanying the Department of the Interior, Environment, and Related Agencies Appropriations Act, 2010, and separate recommendations of individual members regarding issues associated with the development of both renewable and conventional energy from Federal lands both onshore and on the Federal Outer Continental Shelf (OCS).

Federal lands and offshore areas managed by the U.S. Department of the Interior (DOI) and the U.S. Department of Agriculture (USDA) Forest Service (USFS) are key components of a comprehensive energy strategy that increases the safe and responsible production of natural gas and oil in the United States, makes renewable energy a priority, begins to move the Nation toward a clean energy economy, creates jobs, and reduces our dependence on foreign oil.

The United States' conventional energy supplies have been, and continue to be, a critical component of our Nation's energy portfolio. Even as the Nation responded to the Deepwater Horizon oil spill in the Gulf of Mexico, total U.S. crude oil production was higher in 2010 than in any year since 2003. U.S. natural gas production is also increasing, reaching 26.9 trillion cubic feet in 2010, a 5 percent increase from 2008 and the highest level in more than 30 years. Offshore, oil production from the OCS has increased by more than a third, from 446 million barrels in 2008 to an estimate of about 600 million barrels in 2010. Onshore, oil production from public lands increased 5 percent over the last year, from 109 million barrels in 2009 to 114 million barrels in 2010.

Overall, imports have fallen by 9 percent since 2008, and net imports as a share of total consumption have declined from 57 percent in 2008 to less than 50 percent in 2010.

As part of its comprehensive energy strategy, the Obama Administration has offered, and continues to offer, millions of acres of public land for oil and gas exploration and production. In 2010, the Bureau of Land Management (BLM) held 33 oil and gas lease sales covering 3.2 million acres. In 2011, the BLM is scheduled to hold an additional 33 lease sales. Currently, 38.2 million acres of public lands are under lease for oil and gas development, of which only 16.6 million acres are active and 21.6 million acres are inactive. In 2010, the BLM processed more than 5,200 applications for permits to drill (APDs) on Federal and Indian lands. In 2011, the BLM expects to process more than 7,200 APDs.

Offshore, in 2010, the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) offered 36.9 million acres in the Gulf of Mexico for oil and gas exploration and production; 37.9 million acres of the OCS are under active lease, of which 6.5 million acres are producing.

While offering public lands and Federal waters for oil and gas production, the Obama Administration has also undertaken needed reforms to make oil and gas development safer and more environmentally responsible. The Deepwater Horizon oil spill underscored the need for reforms to the safety and oversight of exploration, development, and production.

Since the Deepwater Horizon spill, the DOI has raised the bar for safety and environmental responsibility, setting standards and certification protocols for drilling well design, testing, and control equipment and establishing rigorous per-

formance standards to reduce workplace error and require operators to maintain comprehensive safety and environmental management programs. Operators must now submit well-specific blowout scenarios and revised worst-case discharge calculations. Deepwater operators must also show that they have the capability to contain a subsea discharge like the Deepwater Horizon oil spill. These standards set a clear, achievable path for responsible offshore exploration, development, and production.

The Administration's energy strategy encourages increased conventional energy production, but it has also opened a new frontier for renewable energy production on public lands and waters. Working with many partners and stakeholders among Federal, state, tribal, and local interests, the DOI and USDA/USFS are pursuing a new coordinated strategy for balanced and responsible development of conventional and renewable energy on Federal lands. Together, our Departments manage about 700 million acres of land onshore, and the DOI manages energy development on 1.7 billion acres of the OCS. This new frontier holds vast potential for renewable energy production from wind, solar, geothermal, hydropower, and biomass that – together with conventional energy resources – can contribute to the Nation's energy security and to the clean energy economy of the future.

However, the development of these energy resources must be carried out in balance with many other uses and values that serve the public interest and support the quality of life American citizens enjoy. These values include cultural, ecological, economic, historical, recreational, and scenic resources.

In March of 2009, soon after his appointment to the Department of the Interior, Secretary Ken Salazar issued Secretarial Order 3285 making the production, development, and delivery of renewable energy one of the top priorities for the DOI as part of a balanced energy development strategy. Also in his first few months, the Secretary reached an agreement with the Federal Energy Regulatory Commission to clarify jurisdictional responsibilities regarding offshore renewable energy development, approved the issuance of a new framework for offshore renewable development, and instructed the BLM to proceed vigorously with the process of reviewing onshore solar, wind, and geothermal energy development applications that previously had been languishing.

The Secretary's renewable energy strategy includes extensive measures, to include, but not limited to:

- Appropriate siting of energy projects to optimize opportunities while protecting scenic resources, wildlife, and other values and maximizing the use of areas that are already developed;

- Proactive interagency and interdepartmental collaboration and consultation in the ongoing development of a comprehensive strategy for meeting our renewable energy development goals;

- Assistance and support for the Federal Energy Regulatory Commission, Department of Energy, and state governments in conducting strategic planning necessary in the siting and development of transmission facilities to deliver new energy from the public lands to the places where people live and work;

- Development and implementation of policy, methodology, research, and management tools to prevent or minimize short- and long-term impacts of energy development; and

- Measures to ensure full compliance with terms and conditions of development and successful reclamation of energy project sites after the useful life of the projects.

Similarly, Secretary of Agriculture Vilsack has initiated a Departmentwide Renewable Energy Strategy which has significant implications both on and off public lands. The portion that deals with public lands specifically embraces lands managed by the USFS and includes both the national forests and grasslands. The USDA Renewable Energy Strategy dovetails with Secretary Vilsack's "All Lands" approach to caring for the Nation's forests regardless of ownership.

Given the significance of woody biomass in the Nation's current renewable energy portfolio and its expected role in the future, it is noteworthy that Secretary Vilsack has identified this as a special focus area within the Department's overall strategies for renewable energy and forests. The USFS plays a central role in using woody biomass to achieve both land stewardship objectives and providing clean renewable energy. This role ranges from management of the source material on Federal lands to assisting the energy utilization of wood in specific locations and includes conducting fundamental research on the use of wood as an energy source. Other USDA agencies that play key roles in this effort include Rural Development and the Farm Service Agency.

The DOI is leading efforts to implement the necessary frameworks and agreements for the development of comprehensive conventional and renewable energy programs on the OCS. On April 22, 2009, the President announced that the DOI completed the Final Renewable Energy Framework to govern management of the Department's Offshore Renewable Energy Program. This rulemaking established a program to grant leases, easements, and rights-of-way for orderly, safe, and environmentally responsible renewable energy development activities, such as the siting and construction of offshore wind farms on the OCS, as well as other forms of renewable energy such as wave, current, and solar energy.

The BLM, BOEMRE, and USFS are entrusted with an enormously complex and critical responsibility: to protect our natural resources while managing the energy resources of Federal lands and waters to promote our Nation's energy security; reduce our dependence on foreign sources of energy; provide jobs and economic opportunity to advance America's economic recovery; and contribute to a cleaner, healthier environment.

To develop and deliver conventional and renewable energy in a manner that balances energy production with protecting public land resources and values, our Departments are taking the following actions:

- Siting projects to maximize protection of resources and values;
- Playing a leadership role in the creation of new woody biomass opportunities;
- Managing public resources with sensitivity toward special landscapes, coastal areas, and ridgelines through the land use planning process;
- Involving interested stakeholders—local, state, and tribal governments and industry, the general public, user groups, and advocacy groups;
- Completing thorough, science-based environmental reviews;
- Minimizing visual impacts through Visual Resource Management;

- Addressing wildlife and habitat concerns by reducing impacts through proper project siting and mitigating impacts that cannot be avoided;

- Avoiding national parks, USFS roadless areas, and other important protected landscapes;

- Investigating and applying new management strategies, such as adaptive management, where appropriate;

- Coordinating and consulting effectively across the Government;

- Applying best management practices to help ensure that energy development is conducted in an environmentally responsible manner, such as reducing the area of disturbance, adjusting the location of facilities, or choosing a paint color to help a facility blend into the landscape better; and

- Requiring bonds that cover reclamation costs and help guarantee compliance with the terms and conditions of the rights-of-way or lease and setting reclamation standards that define the reclamation, revegetation, restoration, and soil stabilization requirements of the project area.

The renewable energy strategies of both the DOI and USDA are guided by the fundamental belief that renewable energy for America will allow us to diversify energy sources and ultimately reduce our reliance on fossil fuels. The development of new renewable energy sources need not come at the expense of our Nation's natural and cultural heritage. If promoted and sited in a thoughtful way, new energy development can, instead, contribute to conservation and protection of the environment.

We are determined to succeed in this dual mission. As we proceed, we will continue to rely upon and value the guidance of Congress.

2.0 Introduction

"We have a choice. We can remain the world's leading importer of oil, or we can become the world's leading exporter of clean energy. We can hand over the jobs of the future to our competitors, or we can confront what they have already recognized as the great opportunity of our time: the nation that leads the world in creating new sources of clean energy will be the nation that leads the 21st century global economy. That's the nation I want America to be."

President Obama, March 27, 2009

2.1 Overview

Since the 1973 oil embargo almost 40 years ago, the United States has struggled to reduce energy demand, energy imports, and the impacts of energy use and development. The Nation needs a renewed commitment to these objectives. Thus, President Obama and his Cabinet, working closely with the Congress, have set ambitious goals for developing new, domestic clean energy sources while reducing oil demand and oil imports. The DOI and USDA can play a central role in providing sites for renewable energy generation, continuing to improve the safety and environmental sustainability of conventional energy development, and making sure there is adequate access for needed electricity transmission infrastructure.

After more than 100 years of conventional energy development on the public lands, the legacy of oil and gas development on the public lands is significant. This development has created prosperity and still supports jobs and energy security for America, but it has also created significant environmental impacts across tens of millions of acres both offshore and onshore. Although much conventional energy development is managed responsibly and with minimal impact, there remain significant opportunities for improvement in the way we manage these resources. The 2010 Deepwater Horizon oil spill was the most obvious example of an unacceptable conventional energy development impact, but the DOI is also faced with unexpected wildlife and air quality issues in many areas of the western United States where conventional energy development has occurred. The DOI continues to provide ample opportunities for conventional energy development from the Federal estate and is enhancing safety and environmental protections to make sure development is carried out responsibly. Industry remains interested in these opportunities, continuing to bid for onshore oil and gas leases and working on new environmental protections for offshore development—from safety and environmental management systems to subsea containment—that will help create an international gold standard for new OCS oil and gas development.

Most renewable energy resources, in contrast, are still in the early stages of development in the U.S. These resources are typically much cleaner to produce and to use than conventional energy resources. However, the potential environmental impacts of renewable energy development must still be taken seriously, with efforts made to limit or prevent negative environmental impacts through responsible development practices. While tens of millions of acres of public lands

and the OCS have been affected by oil and gas development, the first solar energy projects on public lands and the first wind energy projects on the Federal OCS are only now getting started. The DOI and its bureaus that oversee this development (BLM and BOEMRE) are now embarked on a new mission—the responsible development of renewable energy resources such as wind, solar, geothermal, and sustainable hydropower. As the conventional energy industry deals with some of the environmental impacts of its development history and works to achieve higher standards for development, renewable energy developers are working to create a new energy industry under clean, safe standards from the outset.

The President has asked Federal agencies to work together toward doubling renewable energy generating capacity by the end of 2011. This call to increase production of energy from our Nation's own renewable energy resources places the DOI and USDA in a unique position to contribute significantly to one of the most critical national priorities of modern times. In delivering new energy to America, the DOI and USDA are guided by the fundamental belief that renewable energy development, where promoted and sited in a thoughtful way, can fully contribute to conservation and protection of the environment.

Clean, renewable energy development can take place on many areas of Federal lands. Traditional energy resources like coal, natural gas, oil, and other fossil fuels produce carbon dioxide directly and can emit other greenhouses gases, whereas biomass, wind, solar, hydropower, and other renewable energy systems can substantially reduce carbon dioxide emissions on a lifecycle basis. Issued by Secretary Salazar in March 2009, and refined in February 2010, Secretarial Order 3285 makes the production, development, and delivery of renewable energy, onshore and offshore, top priorities for the DOI (Appendix 1).

Meanwhile, traditional energy resources produced from Federal lands managed by the Departments presently account for approximately 30 percent of the Nation's energy supply, and will continue to play a major role in meeting the Nation's energy needs for the foreseeable future.

In addition to playing a preeminent role in managing the energy resources of the public lands and offshore waters, the DOI is also a steward of much of our Nation's natural and cultural resource base. The Department recognizes that the success of its mission depends upon a wise, comprehensive, and strategic plan of action across Federal jurisdictions and among many nongovernmental entities and stakeholders whose contributions are vital. Thus, the DOI works closely with the USDA, Department of Energy (DOE), Environmental Protection Agency (EPA), and other Federal partners, as well as states, tribes, industry, and other users of public lands to develop our energy resources responsibly.

A balanced, responsible approach to energy production from Federal lands and the OCS is integral to the Nation's current energy production and its energy future. Today, about 38.2 million acres of onshore Federal lands are under oil and gas lease, with about 12.1 million acres in production onshore—yet until 2010 when Secretary Salazar approved nine new solar projects on public lands, representing approximately 3,700 megawatts (MW) of electric generating capacity, there was not a single commercial solar energy project on, or under development on, the public lands. The right-of-way grants for these solar projects encompass approximately 36,000 acres. Offshore, there is a similar historic imbalance between renewable and conventional energy development, with about 38 million acres under oil and gas lease (about 6.5 million in production) and no Federal offshore wind or marine

hydrokinetic energy production. The impacts of conventional energy production from Federal lands and the OCS have been significant. To date, the impacts of renewable energy development on public lands are comparatively light.

This report documents the progress made to date and our plan of action for continued progress toward ensuring the highest level of accountability, efficiency, and responsibility in the management of our Federal energy resources.

2.2 Congressional Direction

Statement of Managers (Rept. 111-316) Accompanying the Department of the Interior, Environment, and Related Agencies Appropriations Act, 2010

The conferees understand that renewable energy will become a more significant source of power for the Nation and that the Department of the Interior and the Forest Service will play a prominent role in its development. However, the conferees are concerned about the impacts these projects may have on the landscape and water resources, particularly those for wind and solar power. Proposed solar projects can each cover several square miles and the newest wind turbines are over 500 feet tall. Appropriate siting of these projects and cost-appropriate size limitations are critical to ensuring that the pristine landscapes, limited water resources, and magnificent views of the country's public lands and coastlines are protected.

Accordingly, within 180 days of enactment, the conferees direct the Department of the Interior to submit a report in consultation with the Forest Service on the criteria used for siting renewable energy projects, including the extent to which protection of scenic landscapes, ridgetops, water resources, habitat including that for endangered species, and shorelines will be considered. The report should also provide a detailed strategic plan on how the Department and the Forest Service will coordinate the development of such projects, particularly in areas where there is mixed ownership or management by the Department of the Interior, Forest Service, Department of Defense, and non-Federal landowners. Additionally, the report should identify specifically what areas of the public lands and the Outer Continental Shelf will be considered for projects based on: (1) their potential for renewable energy generation; (2) what additional transmission lines will be necessary to connect these new sources of power to the energy grid; (3) where these transmission lines will be placed; (4) the methodology to be used to limit the size of solar troughs and photovoltaic facilities, and (5) the impact on water resources.

The report should also include an analysis of the useful life of renewable energy sites and provide an explanation of how the infrastructure will be removed from the public lands when it is no longer functional. The conferees believe that some mechanism, such as a bond put forth by the permittees, should be utilized by the Department and the Forest Service so that the government does not have to pay for the removal of these large facilities after they are no longer viable.

The Department of the Interior and Forest Service should consult with the Congress on a regular basis as they proceed with the development of policies and the preparation of environmental documents and permitting of renewable energy projects.

The conferees believe that renewable energy developers should have less difficulty permitting their projects on disturbed private lands than on pristine public lands, in order to facilitate greater species protection and stewardship of public resources and public lands. The conferees recommend that the Secretary evaluate whether

> a cooperative agreement with States under Section 6 of the Endangered Species Act, the establishment of a Section 4(d) rule under the same Act, or the creation of a template `general habitat conservation plan' would improve the permitting process for solar projects on private lands in the California desert.

In chapter 5, this report also responds to further recommendations from Senate Majority Leader Harry Reid, set forth in a December 21, 2009, letter to the Secretary of the Interior, which reads as follows:

> I would like to recommend that you broaden the Department's review to include an analysis of all energy development on public lands not just renewable energy, including siting processes, permitting costs, related staffing, long-term reclamation and remediation costs, multi-agency coordination activities, as well as the methodology used by the Department to limit the short- and long-term impacts on land, water, air quality, wildlife, public health and scenic values associated with non-renewable energy resource extraction, production, and, where applicable, related waste storage. Please include an evaluation of any other issues that would be valuable to Congress in the development of New Energy and public lands policies that will help meet the nation's critical challenges of global warming and energy security.

In developing this report, the DOI and USDA Forest Service have considered Senator Reid's recommendations, as well as a series of requests set forth by Senator Lamar Alexander, former Ranking Minority Member of the Interior Appropriations Subcommittee and current Ranking Minority Member of the Energy and Water Development Appropriations Subcommittee, written in separate letters to both the Secretary of the Interior and the Secretary of Agriculture dated March 2010.

2.3 Responsible Agencies

2.3.1 Bureau of Land Management

The BLM is responsible for more than 245 million acres of public lands as well as 700 million subsurface acres of mineral estate. The BLM manages Federal onshore oil, gas, and coal operations that make important contributions to the Nation's domestic energy supply. These lands also hold extensive renewable energy resources that contribute to the Nation's renewable energy portfolio. This gives the BLM a principal role in fulfilling the administration's goals for a new energy economy based on a rapid and responsible move to large-scale production of solar, wind, and geothermal energy.

2.3.2 Bureau of Reclamation

The Bureau of Reclamation (BOR) is a water resource management agency with numerous programs, initiatives, and activities that will help the western states, Native American tribes, and others meet new water needs and balance the multitude of competing water uses in the West. As the second largest producer of hydroelectric power in the western United States, the BOR plays a key role in providing renewable energy to western consumers while protecting the environment and the public's investment in these structures. BOR facilities help to avoid the annual production of approximately 51 billion pounds of carbon dioxide that might otherwise be generated by fossil fuel power plants.

2.3.3 Bureau of Indian Affairs

The DOI's Bureau of Indian Affairs (BIA) is responsible for the administration of 56 million acres of land held in trust for American Indian tribes, Alaska Natives, and individual Indian landowners. This land contains large amounts of

both renewable and nonrenewable trust resources as well as access to areas with high potential for wind and solar energy resource development. Under the purview of the Assistant Secretary for Indian Affairs, the Office of Indian Energy and Economic Development and the BIA work closely with tribes to assist them in all aspects of energy resource exploration and development including, but not limited to, resource assessment, economic analysis, environmental impact evaluation, and realty management.

2.3.4 Bureau of Ocean Energy Management, Regulation and Enforcement (formerly the MMS)

The BOEMRE, formerly the Minerals Management Service (MMS), manages the Nation's offshore oil, natural gas, and other energy and mineral resources on the Federal OCS. In May 2010, the Secretary of the Interior announced the fundamental restructuring of MMS, moving to divide the agency into three separate entities—Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue—in order to improve the oversight of offshore energy development and the revenues associated with it. The BOEMRE was established as an interim organization, and on October 1, 2010, the Office of Natural Resources Revenue was formally established as a separate entity within the Office of the Secretary. The reorganization is planned for full implementation by October 1, 2011.

The Nation's 1.7 billion acres of the OCS are believed to contain more than 60 percent of the Nation's remaining undiscovered, technically recoverable oil and almost 40 percent of its undiscovered technically recoverable natural gas (MMS National Assessment, 2006). The BOEMRE is also responsible for leasing on the OCS for the development of renewable energy. Future OCS renewable energy activities are anticipated to include electrical generation from wind and hydrokinetic (ocean wave and ocean current) resources.

2.3.5 Office of Surface Mining Reclamation and Enforcement

The Office of Surface Mining Reclamation and Enforcement (OSM) works with the BLM, states, and Indian tribes to assure that citizens and the environment are protected during surface coal mining and that the land is restored to beneficial use when mining is finished. The OSM and its partners are also responsible for ensuring that lands and water which were degraded by mining operations before 1977 are reclaimed. Today, OSM has 24 states which have assumed primary responsibility for regulating surface mining activities within their borders and are administering programs to clean up abandoned mine sites. The OSM has oversight responsibilities for those approved state programs. Through cooperative agreements, the Secretary of the Interior delegates regulatory responsibilities for surface coal mining and reclamation operations on Federal lands to states with approved regulatory programs. The DOI retains the duty to authorize the mining of leased Federal coal. The OSM regulates surface coal mining and reclamation operations on Indian lands. Currently, however, three tribes are in the process of developing their own programs.

2.3.6 National Park Service

The National Park Service (NPS) manages more than 84 million acres of National Park System lands and has responsibility over a variety of other special status areas, to include the National Trails System, wild and scenic rivers, national historic landmarks, national natural landmarks, and places on the National Register of Historic

Places. Given its many stewardship responsibilities, the NPS has a special role to ensure that any leasing, siting, and permitting of energy facilities on the public lands near parks and other special status areas is done in a way that safeguards their resources and values. When the permitting of energy development could impact adjacent park units and other special status areas, the NPS is active in park protection and the decisionmaking process. Current steps are being taken to strengthen these measures.

2.3.7 U. S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) is dedicated to the conservation, protection, and enhancement of fish and wildlife and their habitats by administering laws such as the Endangered Species Act, Migratory Bird Treaty Act, and the Fish and Wildlife Coordination Act. The FWS is responsible for managing fish and wildlife Federal trust resources, including threatened and endangered species, migratory birds, interjurisdictional fish species, certain marine mammals, and the National Wildlife Refuge System. The FWS is engaged in energy planning and review to assist other agencies and the energy industry in avoiding and otherwise mitigating the impacts of energy development on these trust resources. The FWS manages approximately 90 million acres of refuge lands.

2.3.8 U.S. Geological Survey

The U.S. Geological Survey (USGS) Energy Resources Program provides objective, impartial, and scientifically robust information to advance the understanding of geologically based energy resources; contributes to plans for a secure energy future; and facilitates evaluation and responsible use of resources. The Energy Resources Program research portfolio is responsive to national priorities established through legislative directives, internal strategic planning, important and unanticipated global events, customer surveys and needs, and the guiding principles of objective and impartial science. The USGS Water Use Program estimates the amount of water withdrawals associated with eight sectors of water use, including thermoelectric power generation, which is the largest sector of water withdrawals in the Nation. Estimation of water use is a key factor in assessing the sustainability of water supplies to support energy development, while also protecting important environmental values. While contributing efforts to address challenges of the New Energy Frontier, the USGS will be instrumental in providing the science framework and information necessary for all partners to use in analyzing impacts and making decisions on mitigation, restoration, and conservation efforts.

2.3.9 Office of Insular Affairs

The Office of Insular Affairs (OIA) is currently leading efforts to investigate opportunities for increased renewable energy and energy efficiency deployment in the U.S. Territories. The DOI, through OIA, and DOE have entered into an agreement with the U.S. Virgin Islands to decrease the territory's dependence on fossil fuels. In April 2009, the Virgin Islands was chosen as one of three pilot locations for Energy Development in Island Nations (EDIN)—an international partnership with the goal of bringing renewable energy to islands around the world. Through participation in EDIN, the Virgin Islands will be able to access technical resources of the DOE's National Renewable Energy Laboratory (NREL) to develop technically and economically sound plans to implement sustainable energy technologies. The OIA is also working with the DOE/NREL to develop renewable energy and energy efficiency plans for the three Pacific Territories of American Samoa, Commonwealth of the Northern Mariana Islands, and Guam.

2.3.10 USDA Forest Service

The USFS manages 193 million acres of National Forest System lands that are important sources of both conventional and renewable forms of energy. This is a point of emphasis in the USDA Renewable Energy Strategy. The lands and resources represent a sustainable, strategic asset in achieving and enhancing U.S. energy security, economic opportunity, environmental quality, and global competitiveness. Given its many stewardship responsibilities, the USFS has a special role to ensure that any leasing, siting, and permitting of energy facilities are done in a way that protects the character of protected areas, such as wilderness, roadless areas, and wild and scenic rivers and trails. Given the significant role that biomass plays in the Nation's renewable energy portfolio, the USFS plays a lead role in furthering the use of woody biomass. Secretary Vilsack's "All Lands" vision for forests helps guide this focus beyond the national forests and grasslands.

The USFS works across ownerships to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs, including energy needs, of present and future generations. Specifically, the State and Private Forestry organization of the USFS reaches across the boundaries of national forests to states, tribes, communities, and nonindustrial private landowners of the Nation's forested lands. USFS Research and Development scientists develop, execute, and disseminate science practices and technology to improve the health, resiliency, and use of all the Nation's forests and grasslands, including for biomass energy and integrating energy production into sustainable forest and grassland management.

2.3.11 U.S. Department of Energy

The DOE has been a long-standing partner with the DOI and USDA. The DOE cooperation falls into several areas including training, direct technical assistance, policy support, transmission planning, siting of large scale projects, research and development of new technologies, and sponsoring research and development of wind turbine impacts on wildlife. Specific support areas are as follows:

- The DOE worked with the BLM to conduct a programmatic environmental impact statement (PEIS) for wind, which was completed in 2006, and one for solar, expected to be complete in 2011.

- The DOE and the BLM signed a memorandum of understanding (MOU) on July 8, 2010, that establishes public land for a solar demonstration zone (SDZ). This SDZ will be public land that is withdrawn for the DOE. The DOE will work with industry to demonstrate advanced solar generation technologies at this site.

- The DOE and national laboratory staff are developing and conducting training courses in wind and solar technologies for DOI staff. These courses include information on technology, performance, economics, construction level impacts, and environmental impacts.

- The DOE, the U.S. Army Corps of Engineers (ACOE), and the BOR signed an MOU to work toward the increased development of sustainable hydropower generation opportunities on BOR and ACOE facilities.

- In June 2010, the DOE and BOEMRE signed an MOU to cooperate on a number of issues related to offshore wind development.

- On February 7, 2011, Secretary Salazar and Secretary of Energy Steven Chu unveiled

A National Offshore Wind Strategy: Creating an Offshore Wind Industry in the United States, a joint strategic plan to accelerate the development of offshore wind energy.

- The DOE is working with the OIA to support the increased use of renewable energy in the U.S. Territories.

- The DOE works with all DOI agencies and bureaus on the DOE Federal Energy Management Program to encourage increased energy efficiency, water conservation, and renewable energy deployment at DOI facilities (e.g., national park sites, BLM field offices, Main Interior Building).

- The DOE's Office of Electricity Delivery and Energy Reliability is working with other Federal agencies including the Departments of the Interior, Defense, Commerce, and Agriculture to improve energy delivery and enhance the electric transmission grid for the future. These agencies are working together to establish a coordinated network of Federal energy corridors on Federal lands throughout the United States. An example of this work is the West-wide Energy Corridor project.

2.3.12 National Oceanic and Atmospheric Administration

The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) is also an important Federal partner on energy issues. Their expertise, services, and responsibilities are critical to energy conservation, development, production, management, and delivery. The NOAA also helps to ensure the protection of coastal and ocean environmental resources as energy activities take place. The administration is involved in a variety of energy sectors, including offshore oil and gas, marine hydrokinetic energy, liquefied natural gas, ocean thermal energy conversion, offshore and onshore wind energy, solar energy, biomass and biofuels, traditional hydropower, and nuclear energy.

3.0 Overview of Renewable Energy Resources on Federal Lands

"The Department of the Interior plays a leading role in our Nation's quest to build a clean energy economy – creating American jobs and driving innovation – by promoting renewable energy on our public lands. As part of this Administration's commitment to a safe, secure energy future, Interior is unlocking our Nation's renewable energy potential in unprecedented ways."

Interior Secretary Ken Salazar

3.1 Onshore Renewable Energy: Wind Energy

- Federal lands currently account for 6 percent of renewable electricity generation and 0.1 percent of a total energy supply of 6 billion kilowatt hours (kWh).
- Abundant wind energy potential exists on Federal lands in the West, Great Plains, and New England.
- The total wind potential for Federal lands alone is up to 350,000 MW.
- The BLM has 25 wind energy facilities on public lands in Arizona, California, Utah, Nevada, and Wyoming with a total installed capacity of 437 MW.
- Federal and state wind energy incentives continue to foster interest in commercial wind energy projects on public lands.
- Forty-seven new wind development project applications are currently being processed.

3.1.1 Overview

Wind power uses the naturally occurring energy of the wind for practical purposes like generating electricity, charging batteries, or pumping water. Wind turbines capture the kinetic energy in the wind, converting it into electrical energy. Utility-scale turbines are mounted on tall towers, usually 200 feet or more above the Earth's surface where the wind is faster and less turbulent. In utility-scale power applications, multiple turbines are connected to the utility grid, providing electricity when the wind blows.

For more than a decade, wind energy has been the fastest growing energy technology worldwide, achieving an annual growth rate greater than 30 percent. As of January 2010, the United States has a total installed wind energy capacity of 35,000 MW.

Potential impacts associated with wind energy development are complex and specific to each site. The priority concern now are impacts relating to bird and bat collisions with rotating blades and wildlife habitat alteration and fragmentation. Although proper siting decisions, stipulations, and good management practices can minimize these environmental concerns, an effective monitoring program is needed to collect data and continue to observe effects. The potential impacts on resources such as wildlife and scenery will be analyzed in site-specific National Environmental Policy Act (NEPA) documents, as appropriate.

Wind turbines can also negatively impact America's network of radars. The NOAA is working with the Departments of Defense, Homeland Security, and Transportation to develop software to model potential wind turbine impacts on radars in advance of turbine installation to better support the evaluation of industry siting requests. For example, turbines, when sited close to weather radars, can cause false readings that can disrupt forecaster situational awareness and radar algorithms.

Additional infrastructure for and placement of wind energy facilities are important to transmission of wind energy. As wind energy scales up to become a greater share of electricity supply, wind energy projects may be challenged by the need to connect to the energy transmission grid. As an intermittent source of generation, major new development projects are likely to require enhanced regional transmission capability, energy storage capacity, and/or backup generation capacity to successfully integrate into the grid without jeopardizing transmission reliability. In addition to wind development, solar and geothermal projects may require new or significant upgrades to the existing transmission grid, as would some new conventional electricity generation sources.

Laws recently enacted by 33 states require electric utilities to provide a portion of their energy from renewable energy sources. As a result, the BLM and USFS anticipate a continued increase of interest in the use of Federal lands for renewable energy development. Specifically, the BLM:

- Manages 20.6 million acres of public lands with wind power potential in 11 western states;
- Has 207 rights-of-way applications pending for the use of public lands for wind energy site testing; and
- Has 25 installed wind development projects with a capacity of 437 MW and an additional four projects approved but not yet completed, which will bring total capacity to 580 MW.

3.1.2 Wind Energy on BLM-Managed Lands

A PEIS relating to the authorization of wind energy projects on BLM-managed lands was completed in June 2005. This PEIS provides an analysis of the development of wind energy projects in the West. In conjunction with the publication of the PEIS, the BLM amended 52 land use plans to allow for the use of public lands for wind energy development. The BLM offices are able to use the PEIS as an aid in analyzing impacts of specific applications for the use of public lands in the development and production of wind energy.

In 2006, the BLM issued a wind energy policy to provide guidance on best management practices and measures to mitigate potential impacts on birds, wildlife habitat, and other resources. The 2006 policy was updated in December 2008 with regard to rental rates, visual resource guidance, requirements for plans of development, and areas excluded from development. However, as the siting of renewable energy projects on the landscape is relatively new, much remains unknown about effects on wildlife and habitat. The BLM continues to conduct studies necessary to evaluate and process the increasing number of rights-of-way applications for the siting of wind energy projects and rights-of-way applications for electric transmission lines for these projects.

3.1.3 Wind Energy on National Forest System Lands

The USFS, in partnership with the DOE's National Renewable Energy Laboratory in Golden, Colorado, prepared a report entitled, Assessing the Potential for Renewable Energy on National Forest System Lands. This document covered approximately 170 million acres of national forests and national grasslands. The assessment excluded Alaska, wilderness areas, wild and scenic river corridors, national recreation areas, inventoried roadless and roadless areas, and other areas where laws or other land management objectives would prohibit or severely restrict renewable energy development. The assessment projects a maximum development potential of approximately 139,000 MW of wind energy from National Forest System (NFS) lands.

Numerous inquiries have been made about the siting of meteorological towers to obtain data regarding feasibility of wind energy development on these lands. Appendix 2 displays those inquiries and proposals for wind energy facilities on NFS lands. As of December 2010, there were approximately 10 meteorological towers installed on NFS lands nationwide.

Currently under review, the Deerfield Wind Project is a proposal to construct and operate a wind energy facility on NFS lands in the Green Mountain National Forest in Searsburg and Readsboro, Vermont. The project would construct 15 new 2 to 2.1 megawatt-class wind turbines.

The USFS recognizes that renewable energy production and transmission are appropriate uses of NFS lands. The agency is developing and implementing national directives to enhance consistency and efficacy in siting, authorizing, and administering wind energy site testing and development on NFS lands. These directives will supplement rather than replace existing special use regulations and directives.

3.1.4 U.S. Fish and Wildlife Service Wind Energy Guidelines

The Wind Turbine Guidelines Advisory Committee was established in 2007 under the Federal Advisory Committee Act to provide advice and recommendations to the Secretary of the Interior on developing effective measures to avoid or

minimize impacts to wildlife and their habitats related to land-based wind energy projects. The FWS chaired the committee, which included 22 members representing Federal and state agencies, wildlife conservation organizations, and the wind energy industry. The committee's recommendations contain advice regarding policy issues, as well as science-based technical guidance on how to best assess and prevent adverse impacts to wildlife and their habitats while allowing for the development of the Nation's wind energy resources. Based on this work, the FWS developed the Draft Voluntary Land-Based Wind Energy Guidelines. These guidelines were released on February 8, 2011, and will be open for public comment until May 19, 2011.

These recommendations, aimed at minimizing the impacts of land-based wind farms on wildlife and habitat, will be used to develop final FWS Wind Turbine Guidelines. The finalization process will include coordination with other Federal agencies and public comment. The FWS guidelines will be applicable to private as well as Federal lands.

The development of facilities to generate electricity from wind turbines in the western United States has increased dramatically in the range of the golden eagle, putting these eagles at risk from collision with wind turbines. The FWS is charged with implementing the Bald and Golden Eagle Protection Act and has developed the Draft Eagle Conservation Plan Guidance to address this problem. These guidelines were released on February 8, 2011, and will be open for public comment until May 19, 2011.

The BLM, USFS, and FWS have coordinated closely during the development of wind energy policy and guidelines to ensure consistency among the agencies. In 2011, the FWS is planning to expand its research to learn the impacts of wind energy technology on wildlife in the Great Plains and offshore coastal areas.

The Committee's recommendations include:

- A decisionmaking framework that guides all stages of wind energy development;
- Reliance on the best available science when assessing renewable energy projects and their potential environmental impact; and
- Use of landscape-scaled planning that recognizes the need to think long term about protecting our Nation's economic and natural resources.

3.2 Onshore Renewable Energy: Solar Energy

- Solar radiation levels in the Southwest are some of the most ideal in the world for energy production. Federal potential is found principally on BLM-managed lands, with 23 million acres of public lands having solar energy development potential.

- Energy from the sun is used to generate electricity; heat water; and heat, cool, and light buildings.

- Solar energy accounted for 0.9 billion kWh, or 1 percent, of renewable electricity generation in 2008.

- To date, there is no installed solar capacity on BLM lands. In 2010, the BLM approved nine solar projects, with a total capacity of 3,682 MW.

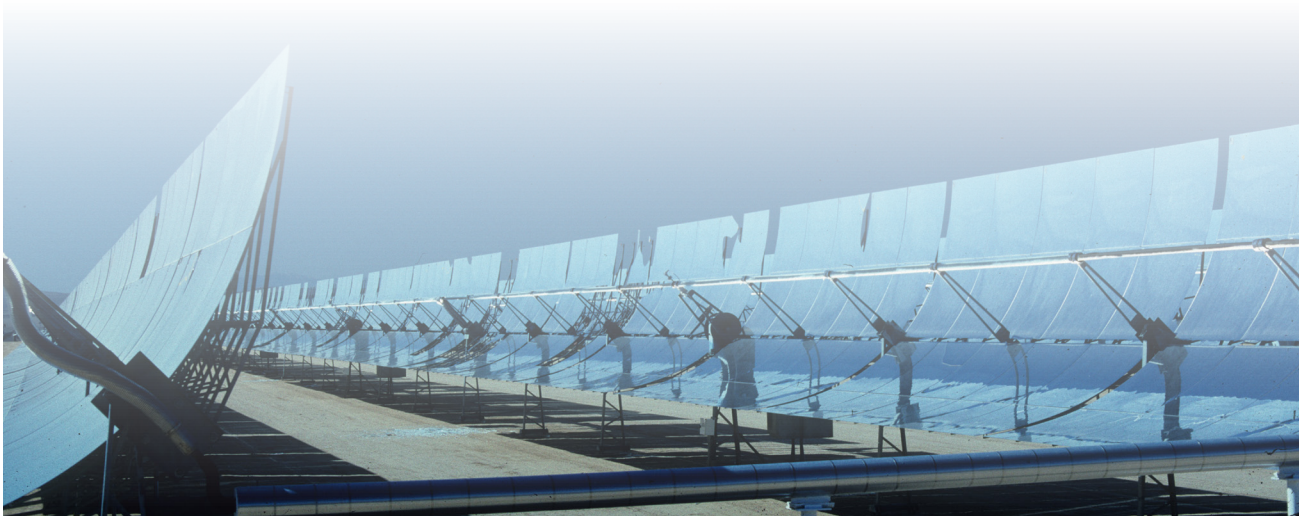
As of late 2010, the BLM had more than 100 applications pending for utility-scale solar energy projects in Arizona, California, Nevada, and New Mexico that involve about 1.05 million acres of land and have an applicant-estimated capacity of 61,000 MW.

As of late 2010, the USFS had not received any applications for utility or other large-scale commercial solar facilities.

3.2.1 Solar Energy Programmatic EIS for BLM-Managed Lands

In December 2010, the BLM and the DOE completed a draft BLM/DOE Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. The document, a landscape-level planning effort to facilitate environmentally responsible solar energy development, analyzes the potential impacts from utility-scale solar energy development and evaluates alternatives for establishing a comprehensive solar energy development program. The public comment period on the draft PEIS opened December 17, 2010, and ran through March 17, 2011. The comment period was recently extended through April 16, 2011.

Twenty-four solar energy study areas, comprising approximately 677,400 acres—more than 1,000 square miles—are being analyzed in detail to determine whether they are appropriate for designation as Solar Energy Zones to be managed with a preference for solar energy generation on sites suited for solar development (see 3.2.2).



In the draft PEIS, the BLM proposes to: (1) establish a new Solar Energy Program that would include Solar Energy Zones, (2) standardize and streamline the authorization process for solar energy development projects, and (3) establish mandatory design features for such development on public lands, thus providing a more efficient process for siting and permitting responsible solar energy development.

As part of the draft PEIS development, the DOE plans to develop a suite of solar energy environmental policies and mitigation strategies that would apply to the deployment of DOE-supported solar energy projects, whether located on BLM-administered lands or other Federal, state, tribal, or private lands. The BLM would continue to employ its own environmental policies and mitigation strategies when making decisions on whether to issue rights-of-way for utility-scale solar energy development projects on public lands. The BLM and DOE will work together to implement consistent policies and strategies.

Public lands deemed technically suitable for utility-scale solar energy development are located in a six-state study area (including Arizona, California, Colorado, Nevada, New Mexico, and Utah). These lands are suitable because: they have excellent solar energy resources; they have low slopes of less than 5 percent—since higher slopes are a barrier to construction for most solar facilities; they have contiguous areas of at least 247 acres (1 square kilometer)—since utility-scale solar facilities require concentrated development.

Further evaluation was conducted on these lands to address potential environmental suitability concerns.

Lands containing outstanding cultural, ecological, or scientific values within the BLM's National Landscape Conservation System (NLCS) were excluded from further analysis. The categories of NLCS lands that were excluded include wilderness areas, wilderness study areas, instant study areas, national conservation areas, national monuments, wild and scenic rivers, and national historic and scenic trails.

Other potentially sensitive areas that were eliminated from further analysis in the solar draft PEIS include: areas identified as critical habitat for threatened and endangered species, areas of critical environmental concern (ACEC), special recreation management areas (SRMA), areas designated by the BLM as no surface occupancy, and areas designated by the BLM in its existing land use plans as exclusion or avoidance areas for development.

The resulting lands that the BLM considers to have solar development potential include approximately 4.5 million acres in Arizona, 1.8 million acres in California, 0.15 million acres in Colorado, 9.6 million acres in Nevada, 4.1 million acres in New Mexico, and 2.5 million acres in Utah.

As with all forms of energy development, there are potential environmental concerns from solar energy development, such as land disturbance/land use impacts, aesthetic impacts, impacts on wildlife habitat, consumption of water and other resources, problems connecting to the grid, and using potentially hazardous materials. Although proper siting decisions, stipulations, and good management practices can help to minimize environmental concerns, an effective monitoring program is needed to collect data and continue to observe all effects.

3.2.2 Solar Energy Study Areas

In addition to lands identified in the solar draft PEIS, the BLM identified 24 tracts of BLM-administered land in six western states, known as

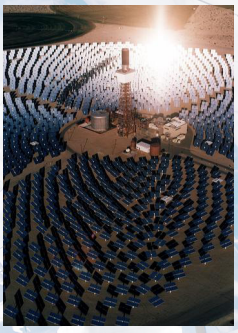
Solar Technologies: 2010 Approved Projects

Parabolic Trough

- 60 percent of applications
- 3 approved projects

Photovoltaic

- 30 percent of applications
- 2 approved projects



Power Tower

- 10 percent of applications
- 2 approved projects

Solar Dish

- No pending applications
- 2 approved projects

solar energy study areas, with the potential to be used for large-scale solar energy production. BLM experts at state and field office levels created and assessed guidance to identify the study areas. The guidance criteria include: proximity to existing roads, transmission, or designated transmission corridors; and a size of at least 2,500 acres. Lands in these study areas are flatter than other lands identified in the draft PEIS as technically suitable for solar development, with slopes that are generally less than 2 percent. Additionally, the areas must be free of other types of conflict, such as threatened and endangered species habitat, ACECs, SRMAs, and NLCS lands.

There are three solar energy study areas in Arizona, four in California, four in Colorado, seven in Nevada, three in New Mexico, and three in Utah. The study areas range in size from 1,522 acres (De Tilla Gulch in Colorado was originally about 2,500 acres but revised to avoid a sensitive area) to 202,295 acres (Riverside East in California). The 24 study areas are located in 14 separate BLM district and field offices and 16 separate counties.

The boundaries of several of the study areas were altered in response to scoping comments and based on land management considerations, including the need to protect adjacent special status areas such as national parks. The revisions will make the study areas easier to describe and manage, eliminate areas with sensitive resources, and in some cases, add adjacent lands that appear equally suitable for solar energy development. The total combined land area is 677,400 acres. This combined area could harvest enough solar energy to produce approximately 60 to 108 gigawatts (GW), depending on the types of solar technologies that will be used.

3.2.3 Water Use for Solar Facilities

As with other energy facilities, water is a necessary component for construction and operation of all solar energy facilities. During construction, water is needed to control fugitive dust, compact soils, wash equipment, and support the workforce. The amount of water use during construction is dependent on the project location and the specific project design. During operations, all solar energy technologies require water to support the workforce and for periodic washing of mirrors or panels, at a minimum. Water is necessary for facility operations for the useful life of that facility, usually 20 to 30 years. Depending on the technology used, some solar facilities can be relatively water intensive. The technologies that use the most water are those that create electricity by generating steam, such as parabolic trough and power tower technologies. The technologies that use the least amount of water are photovoltaic and dish/engine systems.

Because the ideal locations for solar facilities are typically in arid areas, water use and water availability are key considerations when thermoelectric technologies (those utilizing a steam cycle) are selected. Cooling technologies using the least amount of water are preferred. In practice, however, many more factors must be considered when selecting the appropriate cooling system.

Conventional cooling systems for thermoelectric power plants, usually referred to as wet recirculating cooling, provide the best performance under most weather conditions. Unfortunately, since their primary mechanism for heat dissipation is evaporation of some of the water in the recirculating system, their water demands are the greatest among the available cooling options.

The solar technologies that use the least amount of water are photovoltaic and dish systems that employ dry cooling. Dry cooling systems cool steam in a condenser by passing ambient air over the condenser's surface and are feasible in desert environments. However, the net power output of concentrated solar power facilities equipped with dry cooling will be less than that of a similarly sized facility using wet recirculating cooling.

Hybrid wet/dry systems have been developed that introduce water into the air stream by passing it over the steam condenser or by deluging the outer surface of the condenser with water. The cooling mechanism is the same as for wet recirculating cooling systems; water flash evaporates, cooling either the air stream or the surface of the condenser as it does so. Such wet/dry hybrids are not as thermally efficient as conventional wet recirculat-

ing cooling systems. However, they use substantially less water and offer somewhat better performance than dry cooling alone, but still with some reduction in power output. Such hybrid systems perform best in desert environments where relative humidity is typically very low.

Solar facilities in dry environments may reduce groundwater or surface water requirements by utilizing reclaimed water from wastewater treatment facilities. Some cooling technologies use organic solvents in closed systems in place of water; although, cooling systems of this design have limited capacity and have been successfully applied only to facilities with relatively small generating capacities. However, both of these water-saving systems may be utilized in future solar facilities in arid areas.

While water availability remains the primary consideration in the selection of a cooling system for concentrated solar power facilities utilizing steam, other factors also enter into the selection. These include land requirements, visual resource impacts (i.e., the physical profiles of the system and, in some cases, the steam plume that may result in some weather conditions), the initial chemistry of the available water, the complexity of the water treatment before it can be introduced into the cooling system, capital and operating costs, and the parasitic load (i.e., the amount of power needed to operate the system).

3.3 Onshore Renewable Energy: Geothermal Energy

- The U.S. leads the world in geothermal generation capacity with 3,152 MW (August 2009) from 77 power plants, accounting for about 35 percent of world geothermal production.
- During 2009, geothermal energy accounted for 17 percent of U.S. renewable electricity generation, providing 15 billion kWh.
- Geothermal energy production provides baseload energy, like that from a nuclear or conventionally fueled facility, that is not dependent on fluctuating natural conditions.
- Most geothermal production is in California and Nevada; other active states include Idaho, New Mexico, Oregon, and Utah. California provides 82 percent of U.S. generating capacity or 30 percent of the world's geothermal generating capacity.
- During 2009, about 4.4 billion kWh of electricity was generated from geothermal leases on BLM-managed land, and the electricity supplied 35 power plants.

3.3.1 Overview

The BLM administers more than 245 million surface acres of public lands and 700 million acres of subsurface mineral estate. The USFS is responsible for the surface management of 193 million acres of NFS lands. The Geothermal Steam Act, as amended, defines the role of the USFS in the management of geothermal resources.

The Humboldt-Toiyabe National Forest was the first forest to use the programmatic analysis and established a model for other national forests to follow.

This will facilitate leasing and provide for environmentally sound geothermal energy exploration and development.

3.3.2 Geothermal Energy Programmatic EIS

The BLM and the USFS jointly prepared a geothermal energy PEIS that was completed on December 17, 2008, with the signing of the record of decision. The USDA supported and adopted the PEIS. The record of decision approved the DOI's decision to facilitate geothermal leasing of Federal mineral estate in the 12 western states of Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

The decision (1) allocates BLM lands as open to be considered for geothermal leasing or closed for geothermal leasing, and identifies those NFS lands that are legally open or closed to leasing; (2) develops a reasonably foreseeable development scenario that indicates a potential for 12,210 MW of electrical generating capacity from 244 power plants by 2025, plus additional direct uses of geothermal resources; and (3) adopts stipulations, best management practices, and procedures for geothermal leasing and development.

These actions will be implemented as BLM resource management plan amendments for 114 land use plans. The proposed action and plan amendments were evaluated through the preparation of the Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States, which was prepared in accordance with NEPA, the Federal Land Policy and Management Act of 1976, and the National Forest Management Act of 1976. Even with the record of decision for the final PEIS issued, any ground-disturbing activities for subsequent geothermal exploration, drilling, utilization, and reclamation permits will be subject to additional site-specific environmental review under NEPA.

While the decision did not amend any USFS land use plans, it does provide the framework to facilitate the USFS efforts in the processing of pending geothermal lease applications and future geothermal projects on USFS lands.

The PEIS describes the statutory authority under the Geothermal Steam Act to protect designated thermal features in parks by (1) alerting potential lessees that no leasing is allowed in National Park System units; (2) noting that the Island Park Geothermal Area adjacent to Yellowstone National Park is closed to leasing; and (3) explaining that other lands in proximity to the parks with designated thermal features will require a special analysis of the potential effects of possible geothermal development and may be determined ineligible for lease. The NPS works with the BLM to ensure that these statutory duties are carried out.

The following table illustrates the estimated future geothermal generating potential by state. It was compiled from various sources and served as the basis for the PEIS reasonable foreseeable development scenario for the purpose of impact analysis.

Estimated Future Geothermal Electrical Generation by State

State	Estimated Commercial Development by 2015 (MW)	Estimated Commercial Development by 2025 (MW)
California	2,375	4,703
Nevada	1,473	2,880
Idaho	855	1,670
Oregon	380	1,250
Utah	230	620
Washington	50	600
New Mexico	80	170
Alaska	20	150
Arizona	20	50
Colorado	20	50
Montana	20	50
Wyoming	20	50

Note: This table was compiled from a variety of sources, for the purpose of developing the reasonable foreseeable development scenario in the FINAL Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States (2008).

3.3.3 Siting Geothermal Energy Facilities

The issuance of a geothermal lease does not authorize lease activities, other than casual use. Permits and authorizations are required prior to starting lease operations: drilling of temperature gradient wells, geothermal drilling permits for production and injection wells, and a construction permit prior to building a power plant and associate facilities. The approval process involves a NEPA analysis, which may be an environmental assessment or an environmental impact statement (EIS), depending on the scope of the project and potential impacts anticipated. One of the purposes of the analysis is to incorporate best management practices to minimize the impact of the facility and minimize the footprint.

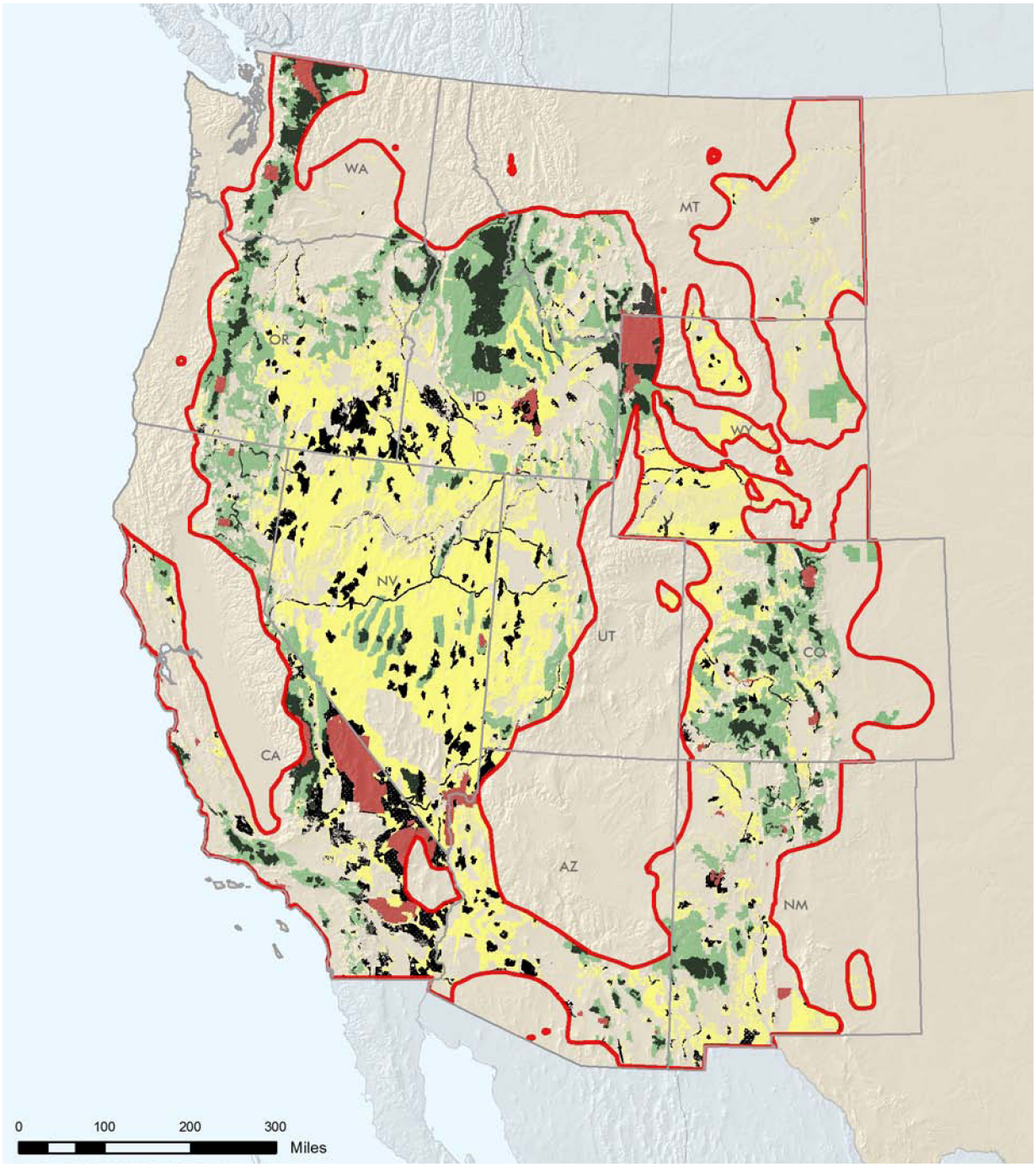
As of late 2010, there were 58 geothermal leases in a producing status covering about 56,000 acres. While some of the leases produce geothermal resources for electrical generation for non-Federal-sited power plants, there were 17 production facilities located on Federal leases for which the BLM has approved a utilization permit. These power plants were sited on a total of 313 acres for an average of 18.4 acres per plant, or about 1 percent of the average lease size of about 1,800 acres. There were 120 geothermal leases covering approximately 134,000 acres of NFS lands.

3.3.4 BLM and Forest Service Coordination

The BLM and USFS have a long history of coordination on geothermal leasing and permitting on USFS-administered lands under an MOU, revised in April 2006, to implement Section 225 of the Energy Policy Act of 2005. Section 225 requires the coordination of geothermal leasing and permitting on public lands and NFS lands between the Secretary of the Interior and Secretary of Agriculture.

The BLM and USFS coordinate geothermal resource leasing activities on NFS lands. While the USFS manages the surface estate of NFS lands, the BLM is responsible for managing the mineral estate. This includes the leasing and permitting of exploration and development of geothermal leases. The USFS serves as lead agency for geother-

Map of Lands with Geothermal Potential



LEGEND:

- Potential geothermal area
- National Park System Lands Closed to Leasing
- Public Lands Open to Leasing
- NFS Lands Open to Leasing
- Public and NFS Lands Closed to Leasing

mal leasing availability analyses and decisions and conducts analysis on geothermal activities on NFS lands. The USFS develops lease stipulations for NFS lands that are only as restrictive as necessary to protect the resources for which they are applied. The USFS provides the consent to lease, and the BLM issues the leases.

The BLM coordinates the NEPA permit review with the USFS, which proposes permit conditions of approval involving surface issues. The BLM is also the lead agency in processing drilling permits intended for production of geothermal resources, water maintenance injection, or utilization to maintain the geothermal resource (which are lease exclusive operations) on Federal lands. Under most circumstances a single NEPA document is prepared, with the BLM as lead and the USFS as the cooperating agency.

3.3.5 Geothermal Energy on Federal Lands

Depending on site conditions and the type of geothermal plant, a typical geothermal electrical generation plant has a surface disturbance between 30 and 130 acres for all associated activities, such as exploration, well sites, pipelines, and power plant. In addition, electrical transmission may require between 20 and 240 acres.

Like other forms of energy development, including conventional energy development, geothermal development can have the following impacts:

- Long-term loss of vegetation, habitat, and soil;
- Short-term and intermittent noise impacts from construction and maintenance activities. Operations would have minimal noise impacts in most areas on Federal lands; however, areas with minimal noise sources (i.e., remote areas) would experience a greater change in the noise characteristics;
- Loss of some recreational opportunities from energy infrastructure, although new roads associated with development could provide access for additional recreational opportunities in some circumstances;
- Long-term visual impact from power plants and infrastructure;
- Short-term impact to ground water during drilling;
- Loss of other land uses, such as livestock grazing; and
- Short-term increases in air emissions from drilling and construction activities.

Moreover, potential cumulative impacts associated with geothermal development include erosion, habitat loss and fragmentation, propagation of invasive species, and viewshed degradation.

3.4 Onshore Renewable Energy: Biomass Energy

- Biomass currently provides almost 2.1 percent of U.S. energy consumption.
- Biomass has the potential to supply an increasing portion of U.S. liquid transportation fuels and can be a substitute for fossil fuels used in heating and/or electrical power.
- Biomass can be used directly or converted into products to provide heat, make fuel, and generate electricity.
- The DOI manages 437 million acres of forest and grasslands. The USFS manages 193 million acres of forest and grasslands.
- Biomass supplied from Federal lands consists primarily of residual material generated from the restoration and management of healthy forest ecosystems. Benefits of removing biomass can include:
  - Resource protection and wildfire reduction
  - Protection of public health and safety
  - Restoration of long-term ecological function
  - Control of invasive species

3.4.1 Overview

The U.S. economy uses biomass-based materials as a source of energy in many ways. Wood and agricultural residues are burned to create steam for electrical power generation and for space heating in residential and commercial buildings.

Biomass is also converted to a liquid form for use as a transportation fuel (ethanol and biodiesel). Biomass harvested from Federal lands is almost exclusively the residual material associated with forest treatments and in the form of woody biomass. Biomass collected on USFS and DOI lands include small-diameter trees and shrubs, tree-harvest debris, noncommercial tree species, as well as undesirable aquatic and terrestrial plant residues.

To date, woody biomass residues have played a minor role in terms of the overall U.S. energy picture. The vast majority has been used in pulp and paper industries, where residues from production processes are combusted to produce steam for electricity generation. Outside the pulp and paper industries, only a small amount of biomass is used to produce electricity. Some power plants combust biomass exclusively to generate electricity while some facilities mix biomass with coal (biomass co-firing plants). The electricity generation sector, excluding co-generators, consumed about 0.7 quadrillion British thermal units from biomass in 2008.

One noteworthy initiative to increase the use of biomass for energy is the Bioenergy Facilities Initiative, which is an interagency working partnership among the DOI, DOE, and USFS to complete feasibility studies on 48 potential sites on Federal, state, and tribal facilities. The biomass technology included in the potential sites ranges from thermal applications to combined heat and power, to large-scale power projects. Each site analysis will include a resource assessment, market evaluation, environmental reviews, technology evaluation, and financing options. A second initiative, from the 2008 Farm Bill Title IX, is the Wood to Energy program, which encourages the use of wood from Federal, state, tribal, and private lands. The wood can be residual byproducts from forest treatments or wood processing mills.

3.4.2 Biomass in Managing Healthy Forest and Range Systems

One of the greatest challenges facing Federal land managers is restoring, maintaining, and enhancing the health and productivity of forest and grass/shrubland ecosystems. Restoring Federal lands at risk of loss from fire, insects, and/or disease often involves the removal of large quantities of small-diameter and lower-quality wood through thinning and prescribed fire treatments. Long-term benefits of forest health often outweigh the short-term investment to achieve the desired health and productivity results. At this time, management of this critical resource is an important part of our renewable energy portfolio.

Siting Criteria

Managing healthy and resilient ecosystems provides Federal land managers the principal criteria needed for determining sites suitable for woody biomass collection. Converting this residual material into energy and biobased products supports improved forest health and productivity as well as local economic opportunities. The discussion on leasing reforms in Section 5.1.2 provides a summary of the factors and requirements considered by land managers as they make decisions on project siting that also apply to woody biomass removal.

Biomass siting is often driven by actions necessary to improve or maintain resource health, resiliency, and function of the ecosystem. When feedstock material is sourced from public lands, this process involves land use planning, environmental analysis (both through a planning EIS and site-specific project environmental assessments), as well as compliance with a variety of environmental laws such as NEPA, the Endangered Species Act, the National Historic Preservation Act, the Clean Water Act, etc. (see Appendix 3).

Water use requirements associated with biomass byproducts are typically not significant. Besides improving land and resource systems, the benefits of biomass energy depend upon the intended use and source of the material. Well-designed forest health treatments with a biomass component can:

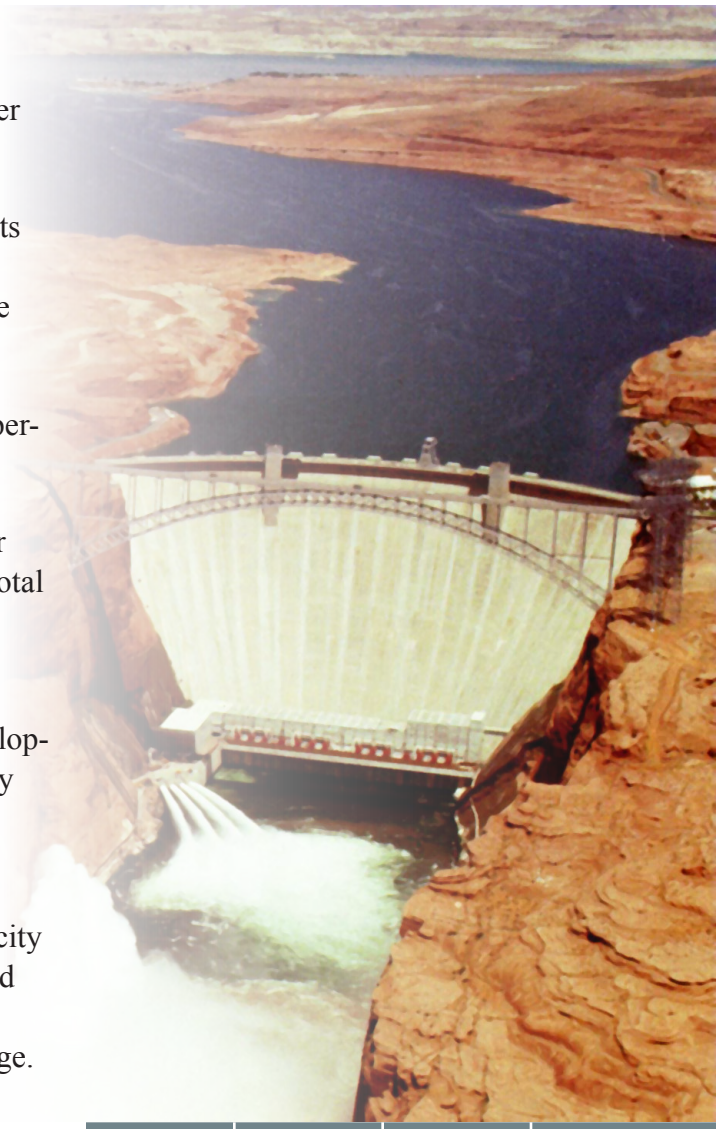
- Improve energy security through reduced dependence on imported fuels;
- Create jobs in new or expanded domestic industries;
- Provide potential environmental benefits, including reduction of greenhouse gas emissions as compared to uncontrolled burning, improved wildlife habitat, and cleaner water flowing from healthy and restored lands; and
- Reduce the risk of catastrophic wildfire by removing combustible material in forests and grasslands, thus improving ecological stability and landscape integrity.

Biomass projects must be designed and appropriately sited to minimize any negative impacts. When designing biomass energy projects, the following factors should be considered:

- Life-cycle production of greenhouse gases[1] and other pollutants;
- Combustion emissions and the need for any air emission control measures;
- The tradeoffs of short-term project impacts versus long-term landscape improvements; and
- The need for reliable feedstock supplies and infrastructure constraints for delivering and distributing feedstock.

[1] Life-cycle production of greenhouse gases - direct emissions for a renewable fuel would include net emissions from growth of renewable fuel feedstock, distribution of the feedstock to the renewable fuel producer, production of renewable fuel, distribution of the finished fuel to the consumer, and use of the fuel by the consumer.

3.5 Hydropower



- The BOR is the second largest hydropower producer in the U.S.
- In the U.S., there are 58 hydropower plants with an installed capacity of 14,876 MW. On average, these plants annually produce more than 40 billion kWh.
- Hydropower provides approximately 17 percent of the power used in the West.
- The BOR owns 28 additional hydropower plants that are operated by others with a total capacity of approximately 600 MW.
- Forty-three hydropower plants have been added to BOR dams by non-Federal developers through the Federal Energy Regulatory Commission license process. Their total capacity is approximately 450 MW.
- Four hydropower plants with a total capacity of approximately 16 MW have been added to BOR dams by non-Federal developers through the BOR's lease of power privilege.
- The BOR has more than 500 dams, diversion dams, and canal drops that do not have hydropower installed, but could potentially support small hydropower development.

3.5.1 Overview

The BOR is the second largest generator of hydroelectric power in the United States. Annually, the BOR currently serves the residential needs of almost 4 million households by generating more than 40 billion kWh of electricity at 58 power plants. An additional 1,000 MW of generating capacity have been installed at 71 BOR facilities by non-Federal developers. The BOR facilities help

Region	Number of Plants	Years	Average Net Generation (MWh)
Pacific Northwest	10	2000-2009	22,141,985
Mid-Pacific	12	2000-2009	4,851,403
Lower Colorado	3	2000-2009	5,754,536
Upper Colorado	12	2000-2009	4,827,526
Great Plains	21	2000-2009	2,461,610
Total	**58**	**2000-2009**	**40,037,059**

to avoid the annual production of approximately 51 billion pounds of carbon dioxide that otherwise would be generated if the facilities' power were to come from fossil fuel power plants.

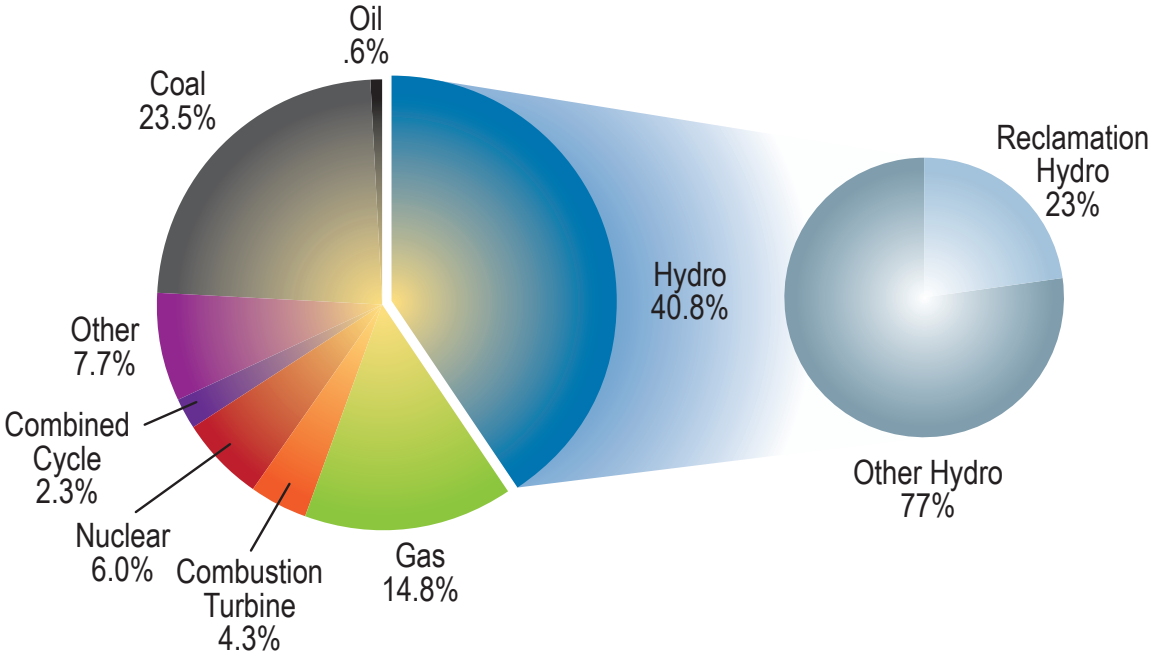
Within the context of western hydroelectric generating capacity, the BOR is a key player. With operations in 17 western states, the BOR has land holdings and facilities which lend themselves well to the support for other forms of renewable energy development. In some cases, hydropower can provide stable backup generation for other forms of renewable energy (e.g., wind and solar) when those resources are unavailable. Integrating other forms of renewable generating resources with hydropower is of keen interest to the BOR and DOI.

There are opportunities to develop additional environmentally sustainable hydropower capacity through installation of technologically advanced turbines on a number of existing BOR dams and canals. This capacity increase would not require new dams. In addition to the potential for new units at existing facilities, the BOR will identify opportunities for increasing generation capacity through an aggressive up-rate and rewind program and the development of pumped storage projects.

The BOR has entered into a partnership arrangement with the DOE and the U.S. Army Corps of Engineers to explore opportunities for the assessment, integration, and installation of hydropower and other forms of renewable energy, such as solar and wind power, on BOR dams, canals, and other facilities. The BOR is also working with the DOE to identify technologies that will facilitate implementation of low-head hydropower, and the agencies have surveyed the industry and are developing a funding opportunity announcement to advance small hydropower development at BOR facilities.

Finally, the energy-water nexus must be moved to the forefront of consideration, and new strategies

Western U.S. Electric Generating Capacity



are needed to ensure that the water footprint of various energy development projects is taken into account. The DOE and the USGS have been conducting research to develop a better understanding of the link between the Nation's energy and water supplies. The BOR and DOE are working to identify energy-water nexus criteria for the BOR's WaterSMART and Title XVI grants that will help better evaluate which proposals best implement the objectives of improving both water and energy efficiencies.

3.5.2 Expanding Federal Hydropower Production

Section 1834 of the 2005 Energy Policy Act requires the Secretaries of Energy, the Interior, and Army to "jointly conduct a study assessing the potential for increasing electric power production at federally owned or operated water regulation, storage, and conveyance facilities." Subsequently, under the 2010 Omnibus Appropriations Act, the BOR was tasked with implementing the results of the Section 1834 study.

The original Section 1834 study did not include any recommendations; rather, it evaluated existing nonhydropower dams using a set of screening criteria, which were appropriate at the time. Prioritized by size, only 80 sites went through the energy analysis and cost/benefit analysis. Of the remaining dams considered, only six came through the process with a cost/benefit ratio greater than one.

The BOR is undertaking a complete reevaluation of the 530 sites that were identified in the original Section 1834 study. All 530 sites, including those with capacity potential of less than 1 MW, were reviewed and considered, and the model used to evaluate the potential for generation was updated to include various turbine technologies. The study used updated economics, including Renewable Energy Credits, transmission interconnection costs, and the potential environmental costs that are associated with hydropower development. As a result of these updates, 43 sites with a capacity of 184 MW were identified as having a benefit/cost ratio greater than 1. The study can be found at www.usbr.gov/power. In 2011, the BOR will continue that study by assessing the hydropower potential at all BOR canal drops in the West.

3.5.3 Memorandum of Understanding

The recently executed MOU among the DOE, DOI, and the Army Corps of Engineers (Appendix 4) will advance the evaluation and identification of renewable technologies with an implementation goal of new sustainable generating capacity on Federal lands and facilities. Signed on March 24, 2010, the MOU will facilitate the rapid evaluation and implementation of new hydropower to aid in meeting the Administration's energy and environmental goals.

3.5.4 Pilot Project Program

The BOR's Power Resource Office is establishing a pilot project program based on best available low-head hydropower generation technologies. The best technologies will be identified by a BOR/DOE team, in collaboration with other resource agencies, with the best sites for development identified by the BOR as part of the updated Section 1834 study. Ultimately, the development sites will be BOR owned and operated where the BOR has authority to develop power. Other BOR development sites will be identified in the updated Section 1834 study, and if the project is successful, the technology may be utilized on these sites in the future.

3.5.5 Hydropower Modernization Initiative

The BOR has hydropower generation on 58 dams in the western United States. Most of these generation facilities were constructed more than 50 years ago and some more than 75 years ago. The BOR has had an ongoing program of up-rating and improving the efficiencies at the dams for the past 30 years, but there are still opportunities to increase the generation output of some of these facilities. In order to identify these opportunities, the BOR joined a study initiated by the U.S. Army Corps of Engineers called the Hydropower Modernization Initiative. This study included a reconnaissance-level review of capacity and efficiencey opportunities at nearly all of the Federal hydropower generation facilities in the United States.

The Hydropower Modernization Initiative identified 10 BOR plants with the potential for 67 MW in capacity increases and 36 BOR plants with the potential to generate an additional 388,357 MWh with the same amount of water through installation of more efficient turbines. The results of this study can be found at www.usbr.gov/power.

3.5.6 Reclamation's Lease of Power Privilege

The BOR has the ability to contract for the installation of non-Federal hydropower generation on certain facilities, which differs from the Federal Energy Regulatory Commission (FERC) license process. Congress granted lease of power privilege (LOPP) authority in two BOR-wide statutes: the Town Sites and Power Development Act of 1906 and the Reclamation Project Act of 1939. This contractual ability is currently extended only to those projects where Congress authorized the development of hydropower or it was administratively authorized to be a component of a specific project.

The BOR's LOPP process is spelled out in its Directives and Standards, which can be found on its website, but certain requirements must be met. These include:

- The determination that an opportunity is afforded for power development at a BOR project;
- A finding that the LOPP will not impair the project's efficiency for irrigation purposes;
- An LOPP contract term of up to 40 years;
- A preference for LOPP contracting with municipalities, public corporations and agencies, and Rural Electrification Act organizations; and
- LOPP rates "sufficient to cover an appropriate share of the annual operation and maintenance cost, interest on an appropriate share of the construction investment at not less than 3 per centum per annum, and such other fixed charges as the Secretary deems proper."

Additionally, all other environmental requirements must be met including NEPA and Endangered Species Act compliance.

3.5.7 Hydropower Facilities on Federal Lands

The Federal Power Act of 1920 authorized FERC to permit the use of Federal lands by private entities and municipalities to develop hydropower facilities. These existing facilities, many of which were licensed in the 1940s and 1950s, are located on public lands withdrawn by the Federal Power Act.

As license terms are nearing the end for a large number of these facilities, the BLM, through

Environmentally Sustainable Hydropower

On March 24, 2010, the Department of the Interior, the Department of Energy, and the Army Corps of Engineers signed a memorandum of understanding (MOU) that will allow the agencies to cooperate more closely and align priorities to support the development of environmentally sustainable hydropower.

The MOU represents a new approach to hydropower development—a strategy that can increase the production of clean, renewable power while avoiding or reducing environmental impacts and enhancing the viability of ecosystems. The DOI will focus on increasing energy generation at federally owned facilities and explore opportunities for new development of low-impact hydropower. With better coordination among Federal agencies, a common-sense approach, and a focus on low-impact hydropower projects, we can supply more clean power for our economy.

participation in FERC's re-licensing process, is providing input into the license review and approval process, and identifying applicable terms and conditions necessary to protect or enhance specific resource values.

The USFS is also actively participating in FERC-administered licensing proceedings for projects occurring on NFS-administered lands to ensure the adequate protection and utilization of the Federal reservation. In a process similar to that used by the BLM, the USFS is reviewing ongoing procedures, seeking to reduce the time and resources needed to establish appropriate terms and conditions for proposed FERC hydropower licenses. A primary means to expedite the licensing process is for non-Federal entities (e.g., license applicants) to work with resource agencies like the USFS and the National Marine Fisheries Service (NMFS) early in the licensing process and to provide those agencies with all of the study information they need to make decisions.

There are approximately 200 FERC-licensed projects on NFS lands with an installed capacity of about 16,000 MW. In the past decade, the USFS has participated in more than 100 license proceedings. FERC-administered hydroelectric license proceedings take about 5 years to complete. The FERC licensing process is a highly regulated and time-intensive process requiring specialized skills, especially those related to water resource management. USFS staffs are actively engaged in all license proceedings for projects on NFS lands to ensure timely processing to meet FERC regulatory deadlines and meet agency management responsibility for the lands under its jurisdiction.

Preliminary permits issued by FERC to applicants to study a given site's potential as a hydropower facility have increased significantly in the past few years. For example, there are 15 preliminary permits for new hydropower development on the national forests in Alaska.

Many NFS lands have the necessary attributes to contribute to the increase in hydropower production on Federal lands. These attributes include many miles of perennial stream flow that drop over significant elevations. Therefore, two likely options to increase capacity on NFS lands are construction of new small projects and the construction and operation of pump-storage projects. Increased capacity via small projects (5 MW or less) would likely occur by constructing new fa-

cilities (diversions, penstocks, powerhouses, etc.) by retrofitting smaller turbines to licensed instream flow releases, which are used to maintain downstream aquatic conditions. Another option to increase small project capacity is by adding new capacity at Federal facilities such as the BOR and U.S. Army Corps of Engineer dams located on lands administered by the USFS. It is difficult to estimate new hydropower production potential on NFS lands without knowing what measures will be necessary to mitigate for project-induced effects. These mitigation measures, which may reduce power generation potential, include instream flows, fish passage facilities, sluice gates to pass sediment, and other measures to maintain functions and processes of streams flowing through NFS lands.

3.5.8 Hydropower and the National Park Service

While some hydroelectric dams do exist in NPS park units, the dams are owned and operated by other entities, and their construction either predated the park unit's establishment or was specifically authorized by Congress.

The NPS cooperates with other Federal agencies and FERC to identify situations where proposed or existing hydropower projects may impact park units. The NPS also provides technical assistance on FERC hydropower licensing proceedings, regardless of whether a park unit is impacted, with emphasis on recommending recreational enhancements.

The NPS anticipates that there may be proposals for increasing hydroelectric generating capacity (e.g., adding hydro to existing dams, pumped storage projects, and marine and hydrokinetic projects) that will have the potential to impact park resources and values even though the projects will be located outside park boundaries.

The hydropower MOU between the DOI, DOE, and Department of the Army recognizes that not every site is appropriate for new or increased hydropower production and that new hydropower development must be environmentally sustainable and take into account the need to maintain healthy river ecosystems and our natural and cultural heritage. These overarching goals of the MOU should help to ensure protection of park resources.

3.5.9 Hydropower and the Fish and Wildlife Service

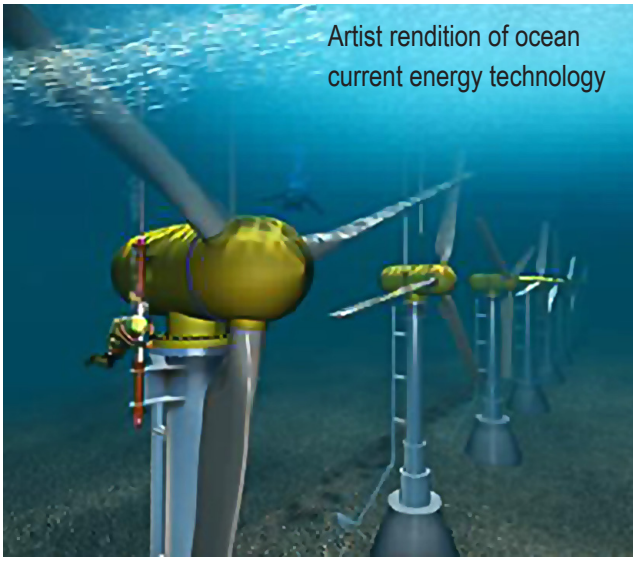
Hydroelectric development can result in significant, long-term effects on fish and wildlife throughout a watershed. The FWS, working with other resource agencies, partners, and project developers, has developed a range of impact avoidance, minimization, and mitigation measures applicable to a wide range of hydroelectric projects. Among these measures are upstream and downstream fish passage facilities for migratory species, measures to operate project reservoirs that reduce the frequency and extent of water elevation changes, and identification of instream flow releases for bypassed river reaches and areas downstream of projects.

The FWS actively engages in the review of both Federal and non-Federal hydroelectric projects as the principal agency responsible for providing technical recommendations on fish passage to FERC. Both types of projects are subject to the provisions of NEPA, the Clean Water Act, the Federal Power Act, and the Fish and Wildlife Coordination Act, among others. Balancing energy production with the protection of instream flows and fish is a characteristic of successful licensing efforts. Bringing FWS expertise to the licensing process facilitates that outcome.

3.6 Offshore Renewable Energy

- The OCS holds significant renewable energy resources that can contribute to meeting the Nation's energy needs.
- Offshore renewable energy resources include many thermal and mechanical forms of energy. However, it is likely that in the foreseeable future, only ocean wind, wave, and current resources will be economically developable.
- Ocean wave and current resource estimates are significant, with great wave energy potential off the Pacific Northwest and ocean current potential off Florida.
- Offshore wind development technology is more advanced than ocean wave and current technology, and OCS wind development is expected to contribute to the Nation's energy portfolio before wave and current development.
- The BOEMRE is moving forward with commercial leasing processes for OCS wind development off the Atlantic coast. These leasing efforts would contribute to jointly announced DOI and DOE deployment scenario of 10 GW of capacity by 2020.

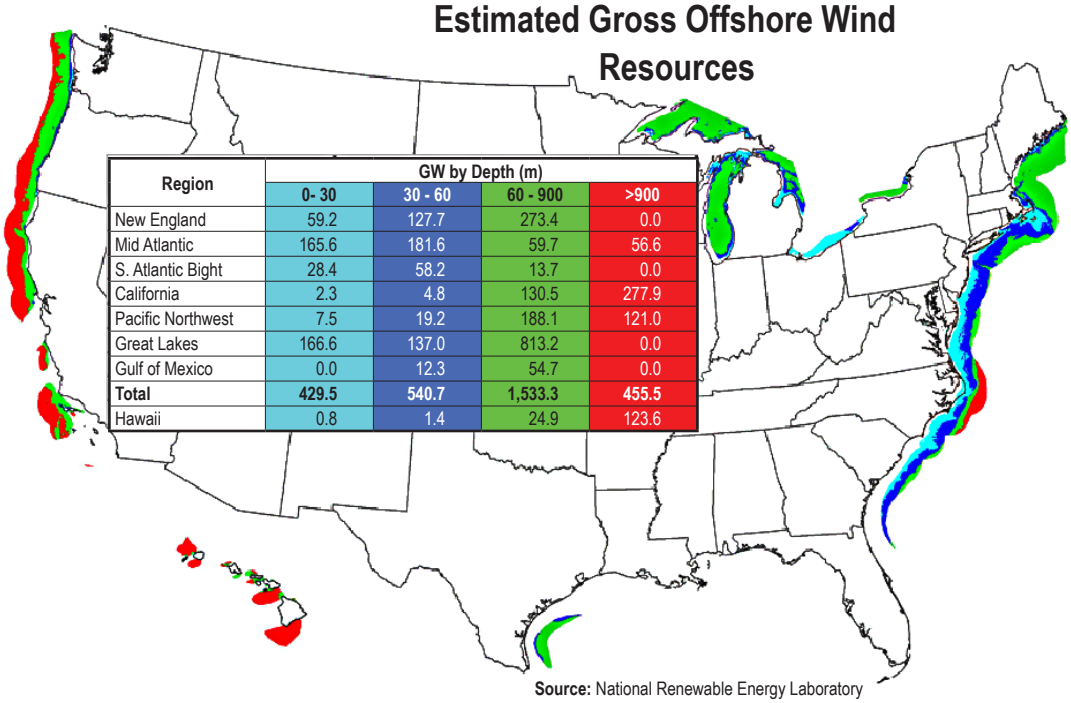
REpower Systems 5M, the world's largest wind turbine with a rated power of 5 MW and a 126-meter rotor diameter.



Artist rendition of ocean current energy technology

Estimated Gross Offshore Wind Resources

Region	GW by Depth (m)			
	0- 30	30 - 60	60 - 900	>900
New England	59.2	127.7	273.4	0.0
Mid Atlantic	165.6	181.6	59.7	56.6
S. Atlantic Bight	28.4	58.2	13.7	0.0
California	2.3	4.8	130.5	277.9
Pacific Northwest	7.5	19.2	188.1	121.0
Great Lakes	166.6	137.0	813.2	0.0
Gulf of Mexico	0.0	12.3	54.7	0.0
Total	**429.5**	**540.7**	**1,533.3**	**455.5**
Hawaii	0.8	1.4	24.9	123.6



Source: National Renewable Energy Laboratory

3.6.1 Overview

Under the Energy Policy Act of 2005 (EPAct), BOEMRE is implementing a program that will allow leasing on the OCS for the development of renewable energy. For the foreseeable future, OCS renewable energy activities are anticipated to include electrical generation from wind and hydrokinetic (ocean wave and ocean current) resources.

In 2007, BOEMRE (MMS at the time) established a separate section, the Office of Alternative Energy Programs, dedicated to managing the OCS renewable energy program. In addition, BOEMRE regional offices have hired and integrated staff for authorizing and overseeing OCS renewable energy program activities.

Soon after he came to office, Secretary Salazar also made the commitment to finalize the review of the proposed Cape Wind Project in Federal waters off the coast of Massachusetts. After a thorough review, including the Secretary's personal visit to the site and with neighboring tribal and coastal jurisdictions, BOEMRE approved the development with conditions in April 2010, issuing a lease in October 2010.

On November 23, 2010, Secretary Salazar launched the "Smart from the Start" wind energy initiative for the Atlantic OCS to facilitate siting, leasing, and construction of new offshore wind projects. The initiative is expected to spur the rapid and responsible development of this abundant renewable resource. The initiative will also allow BOEMRE to: identify priority wind energy areas for potential development; improve coordination with Federal, state, and local partners; and accelerate the leasing process. The leasing process is being simplified, enabling leases to be issued as early as this year. Further, Secretary Salazar has convened interested Atlantic coastal governors in an Atlantic Offshore Wind Energy Consortium to help identify and address regional issues in offshore wind development.

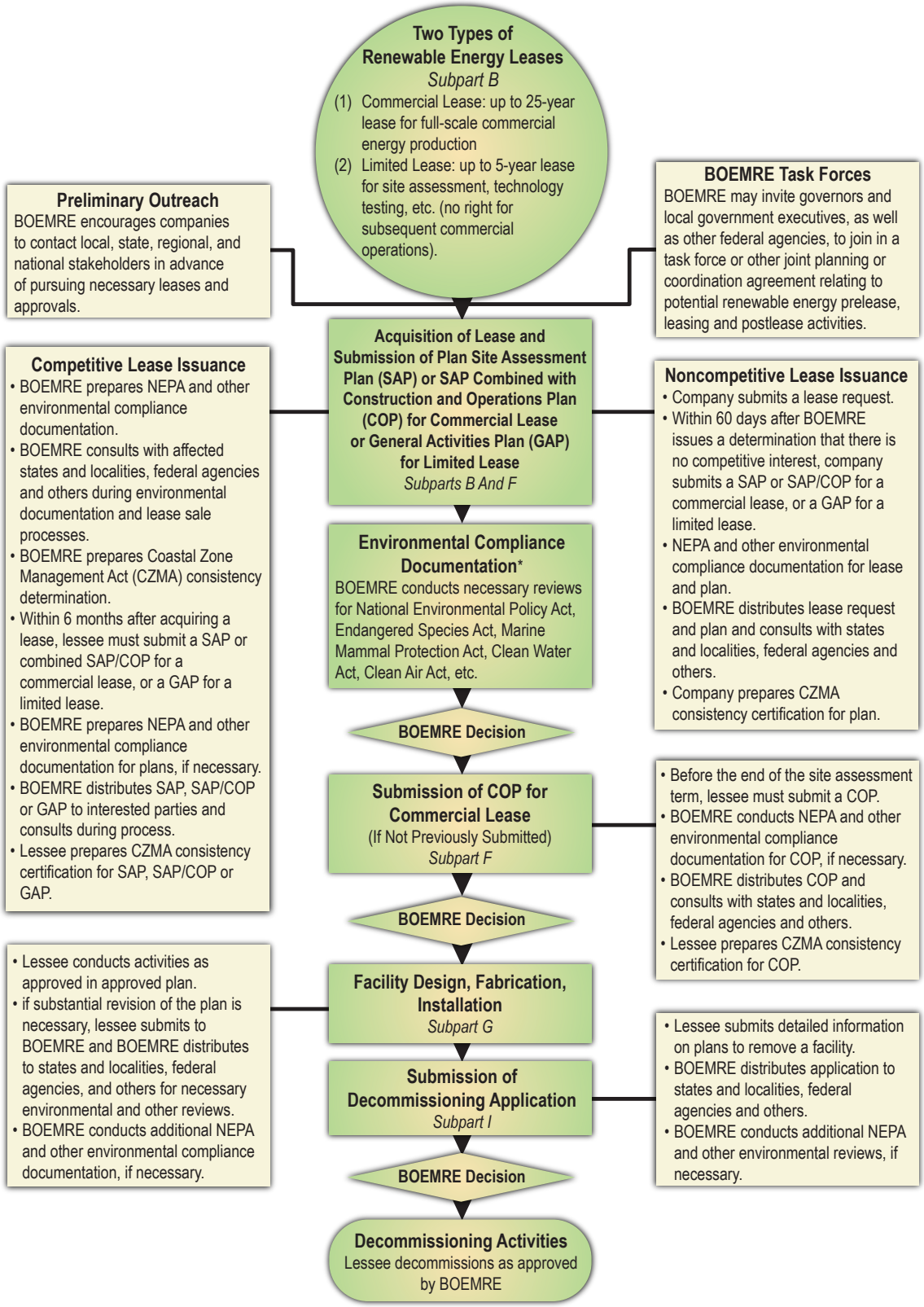
Currently, nine states on the Atlantic Coast are actively pursuing development of OCS wind resources to help achieve renewable energy goals—Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Rhode Island, and Virginia. Industry is considering the potential for wind development offshore other Atlantic states—including Florida, Georgia, and South Carolina. The BOEMRE has established intergovernmental task forces, with participation from Federal, state, tribal, and local governments, to help facilitate commercial wind energy development. The first step in the leasing process is the identification of a wind energy area and the issuance of a request for interest for each area in order to determine whether to proceed with noncompetitive or competitive lease processes.

The BOEMRE has exclusive jurisdiction for managing all aspects of wind development on the OCS. For hydrokinetic renewable energy projects, BOEMRE has exclusive jurisdiction to issue leases, easements, and rights-of-way on the OCS, and FERC has exclusive jurisdiction to issue licenses and exemptions.

In effect, BOEMRE will convey the land right (lease or grant) on the OCS for hydrokinetic projects, and FERC will manage the construction and operation of the generating facility. The roles of both agencies with respect to hydrokinetic renewable energy development on the OCS are delineated in an MOU dated April 9, 2009.

The BOEMRE nonhydrokinetic OCS renewable energy program consists of four major components: (1) lease or grant issuance and administration, (2) site assessment, (3) construction and operations, and (4) decommissioning.

General OCS Renewable Energy Lease Process



* Environmental compliance documentation will be as comprehensive as possible as early in the process as practicable. For example, if an applicant nominates an area for lease and submits a combined SAP/COP along with its nomination, BOEMRE will conduct one comprehensive environmental review covering lease issuance, proposed SAP activities, and proposed COP activities. Thus, subsequent additional reviews may tier off the initial comprehensive review and focus on specific new issues.

The BOEMRE program regarding hydrokinetic projects consists mainly of the first two components listed above, with FERC managing construction and operations and decommissioning. However, BOEMRE will maintain decommissioning requirements through the leases and grants it issues.

The DOI and BOEMRE are implementing the offshore renewable energy program consistent with the President's National Ocean Policy. For example, the assessment of wind energy areas under the "Smart from the Start" initiative uses principles of coastal and marine spatial planning, including comprehensive interagency and interdepartmenal coordination, and these efforts will play a crucial role in informing coastal and marine spatial planning bodies.

3.6.2 Public Involvement

The EPAct requires BOEMRE to provide public notice and consider public comments concerning any proposed OCS renewable energy lease, easement, or right-of-way. Provisions for providing public notice and input are included in the BOEMRE OCS renewable energy framework. Also, public input may be provided through relevant environmental review processes conducted under NEPA.

3.6.3 Policy and Regulatory Framework

As required by the EPAct, BOEMRE promulgated regulations necessary to carry out the OCS renewable energy program. The regulations were developed in consultation with relevant Federal agencies, affected state and local governments, the renewable energy industry, nongovernmental organizations, and other interested and affected parties in a rulemaking process that took longer than 3 years to complete. The OCS renewable energy framework was issued as 30 CFR 285 in April 2009. The regulations have been and will continue to be augmented by explanatory guidelines developed by BOEMRE.

3.6.4 Programmatic Environmental Review

The BOEMRE determined that establishment of the OCS renewable energy program and development of the regulatory framework constituted a major Federal action that may have a significant impact upon the environment within the meaning of NEPA. Therefore, BOEMRE prepared a PEIS to evaluate the environmental impacts of this broad agency action that sets the stage for potential site-specific actions. Since the focus of the PEIS is on the program, it is expected that subsequent NEPA documents prepared for site-specific OCS renewable energy projects will tier from the PEIS and the resulting record of decision.

The BOEMRE completed the PEIS in November 2007 and issued a record of decision on December 21, 2007. Following completion of the record of decision, the DOI committed to completing comprehensive regulations for authorizing and managing all renewable energy activities on the OCS. The record of decision also adopted interim policies and best management practices to apply to the program.

3.6.5 Impact Mitigation

The BOEMRE regulatory framework provides for submission and consideration of relevant environmental information throughout the life of an OCS renewable energy project—from lease or grant issuance to site assessment, construction, and operation to decommissioning of facilities. As shown in the General OCS Renewable Energy Lease Process, compliance with NEPA, the Coastal Zone Management Act, and other relevant laws is required, and appropriate mitigation measures are developed through leasing and plan approval processes and coordination efforts.

The PEIS record of decision adopted a range of mitigation measures to avoid or minimize environmental harm associated with OCS renewable energy activity. These measures include 15 policies relating to issues such as project siting, required consultations, socioeconomic considerations, and adaptive management. The adopted measures also include 52 best management practices that may be incorporated as binding lease or grant stipulations and used to monitor and enforce compliance. Under its adaptive management approach, BOEMRE will employ certification and verification processes applying observed operating experiences to the adjustment of mitigation and monitoring activities on a case-by-case basis.

3.6.6 Interagency Coordination

The EPAct requires BOEMRE to consult with relevant Federal departments and agencies in authorizing OCS renewable energy activity. The table in Appendix 5 lists the relevant agencies and their roles in the OCS renewable energy program. The BOEMRE is in the process of developing guidelines and agreements, such as MOUs, for efficient consultation and coordination with a number of these agencies.

3.6.7 U.S. Fish and Wildlife Service and National Marine Fisheries Service Consultation

The BOEMRE must consult with the FWS and the NMFS to ensure that proposed OCS renewable energy actions are not likely to jeopardize the continued existence of any species listed at the Federal level as endangered or threatened or result in the destruction or adverse modification of critical habitat designated for such species.

Officials of the FWS, as well as the NMFS, are participating in the intergovernmental task forces established to consider commercial wind projects on the Atlantic OCS, and BOEMRE will formally consult on those projects as required by the Endangered Species Act.

The FWS Wind Turbine Guidelines Advisory Committee's charter does not apply to wind development on the OCS. However, in the event that the committee formulates recommended practices for onshore development that may be appropriate for application offshore, BOEMRE would consider and adopt such practices, as warranted. The FWS and BOEMRE have also signed an MOU to implement the Migratory Bird Treaty Act.

3.6.8 Protecting Coastal Units of the NOAA and the National Park and National Wildlife Refuge Systems

Under the EPAct, BOEMRE's renewable energy development on the OCS is precluded within the boundaries of any unit of the National Park System, National Wildlife Refuge System, any national monument, and any unit of the National Marine Sanctuary System administered by the NOAA. The NPS, FWS, NOAA, and BOEMRE are also working together to address and avoid adverse impacts to park and refuge resources and values caused by activities outside the boundaries of these areas. These agencies are also participating in intergovernmental task forces associated with proposed Atlantic wind projects. As conflicts are identified, additional coordination will be needed. By working together at the earliest stages of planning and permitting processes, the NPS, FWS, NOAA, and BOEMRE can take the necessary steps to protect our Nation's natural and cultural heritage, which includes migratory and non-migratory species in parks and refuges.

3.6.9 Decommissioning

The BOEMRE regulatory framework provides that all facilities, including pipelines, cables,

and other structures and obstructions, must be removed when they are no longer used for operations, but no later than 1 year after the termination of the lease or grant. However, there are also provisions for allowing facilities to remain in place for alternate use. Decommissioning information is required for any activities that involve a structure, and that information is considered by BOEMRE in setting appropriate financial assurance amounts. Lessees must provide a general description of their decommissioning concepts and methodologies in their plan filings. In many cases, an actual decommissioning may not occur until more than 20 years later. Therefore, a subsequent decommissioning application detailing plans and activities will be required 2 years before the end of the lease or grant. The BOEMRE will compare the decommissioning application to the general concepts described previously in approved plans to determine whether additional environmental or technical reviews are necessary. Co-lessees, operators, and grant holders are all jointly and individually responsible for meeting decommissioning obligations.

3.6.10 Bonding

The BOEMRE renewable energy program requires lease-specific bonding based on the stage of the project and the level of activities on the lease. Demonstration of financial assurance is required prior to issuance of a lease. A supplemental bond based on the complexity, number, and location of any facilities involved is required prior to beginning site assessment activities. Based on the construction and operation plan for the project, an additional supplemental bond or financial assurance is required based on the complexity, number, and location of facilities involved in the planned activities and commercial operation. Prior to installation of any facilities, the BOEMRE requires a decommissioning bond based on anticipated decommissioning costs.

4.0 Onshore Energy in Balance with Other Resources and Values

Congressional Direction:

The conferees direct the Department of the Interior to submit a report in consultation with the Forest Service on the criteria used for siting renewable energy projects, including the extent to which protection of scenic landscapes, ridgetops, water resources, habitat including that for endangered species, and shorelines will be considered.

House Report 111-316, Renewable Energy and Public Lands

4.1 Overview

Delivering renewable and conventional energy, in balance with protecting other resources and values, is central to the mission of the agencies tasked with managing public lands and resources. The processes for resource planning and protection in the course of energy development—conventional or renewable—are similar and are presented in this chapter. It is difficult for the bureaus—onshore and offshore—to assess past impacts of renewable energy because there has been such limited renewable energy development on public lands and the OCS—only a few thousand acres of public lands affected by geothermal and wind development.

The President and the Congress have laid out important goals intended to help the Nation meet its energy needs. These include energy efficiency, development of a variety of domestic energy sources, investigation and implementation of new energy technologies, and production of energy from onshore and offshore public lands and waters.

The DOI, under Secretary Salazar's leadership, has both jump-started its exploration of possible renewable energy options on public lands and in Federal waters and quickly implemented programs to consider specific renewable energy development opportunities. It has also implemented new oil and gas and coal development oversight measures (see chapter 5). While moving towards this exciting agenda on public lands, the DOI understands that along with best management practices, investment in both baseline and continued research to reduce uncertainty in our predictions of impacts is critical as industry grows to meet our energy needs.

The DOI's renewable energy strategy, as embodied in specific initiatives such as the onshore renewable energy project "fast-track" review and its determination to move forward with offshore wind energy development in the Atlantic region, is directed toward (1) identification of areas where renewable energy potential is significant but would create the least resource conflict and environmental impact, and (2) greater attention to the responsible and responsive review of specific project proposals, within the Department's areas of responsibility.

Through this historic Departmentwide effort, 12 renewable energy projects on public lands were

approved in 2010. When completed, these projects will have an installed capacity of almost 4,000 MW of energy, generate enough energy to power as many as one million American homes, and create thousands of construction and operational jobs.

These commercial-scale initiatives include the first solar project ever permitted on public lands and what will be the largest solar project in the world.

The DOI's 2010 onshore renewable energy accomplishments include:

Solar: Approval by Secretary Salazar of proposals for nine commercial-scale solar energy plants in California and Nevada that will have an installed capacity totaling nearly 3,700 MWh of power and are expected to create thousands of new jobs in the construction, operation, and maintenance of these new facilities. Several of these projects will take advantage of American Recovery and Reinvestment Act incentives, either through the Treasury grant program or the DOE loan guarantee program. These projects will also provide mitigation funding and policy direction expected to help assure the survival of key species such as the desert tortoise.

In addition, the DOI and DOE have joined forces to develop a 25-mile square solar demonstration zone on Federal lands in Nevada to demonstrate cutting-edge solar energy technologies.

Onshore Wind Energy: Approval of a 150-MW project in Nevada. The DOI manages 20.6 million acres of public lands with wind potential in 11 western states.

Geothermal Energy: Approval of two geothermal projects in Nevada that together will produce about 79 MW of energy. The BLM also offered its first geothermal lease in Colorado and approved plans for five geothermal wells on leases in Idaho.

Similarly, under Secretary Vilsack's leadership, the USDA is taking major steps forward with renewable energy production from the Nation's forests and farms. The USDA renewable energy strategy is administered through a variety of USDA agencies and programs and emphasizes energy conservation, sustainable energy feedstock production and management, renewable energy technology development and deployment through research and development, outreach and education, and financial assistance.

4.1.1 Renewable Energy: Organizational Improvements

Within the BLM, interdisciplinary project teams designed to specifically handle given project applications will be responsible for processing applications, applying siting criteria, consulting with other stakeholders, completing environmental analysis, and ultimately recommending whether to approve or deny a project.

The BLM has experienced a significant increase in applications and interest in the development of wind, solar, and geothermal energy resources and associated electrical transmission systems on public lands. These proposals have created a major workload by demanding commitment and resources for the timely and consistent processing of applications.

Secretarial Order 3283 provided direction to establish coordination offices to facilitate the permitting of renewable energy projects. The BLM has established renewable energy coordination offices (RECO), similar in concept to the oil and gas pilot offices authorized under the Energy Policy Act of 2005, to support the permitting of envi-

ronmentally responsible wind, solar, geothermal, and transmission projects on public lands.

The creation of these offices has given the BLM a greater ability to focus resources on processing renewable energy development and electric transmission rights-of-way applications on public lands. These offices will initially include appropriate multidisciplinary BLM staff to process these applications and will eventually include additional resources from other Federal and state agencies to assist in processing the applications.

The BLM has set up RECOs in Arizona, California, Nevada, and Wyoming because the majority of the existing workload for renewable energy applications and projects is located in these states. In addition, the BLM has provided funding for additional resources and staff in states with smaller, but significant, renewable energy workloads. All of the staff provide cross-servicing to other states when needed. The RECOs in Arizona, California, Nevada, and Wyoming are staffed and have filled 106 positions with reassignments or new selections to support the processing of renewable energy and transmission applications. A total of 35 additional renewable energy support personnel have been identified in the other states.

The BLM also set up a National Renewable Energy Office to provide program oversight, coordination, and policy direction for the RECOs. The national office is working with other Federal agencies and offices at the national level, and Congress on legislative, regulatory, and policy issues. The National Renewable Energy Office, located in the BLM headquarters office in Washington, D.C., currently consists of six existing employees, including a renewable energy team leader and a program manager for each of the renewable energy and transmission programs.

The BLM reprogrammed $11 million in June 2009 to expedite the establishment of the RECOs and to provide additional renewable energy staff in the other states for the FY 2009 balance. The BLM also received a $16.1 million increase in the 2010 Interior Appropriations Act for the BLM renewable energy program, including $11.1 million to cover the full-year costs of the RECO staffing and $5 million to fund regional EISs (four solar and one wind).

4.1.2 Priority Renewable Energy Projects

"The BLM is committed to giving priority to renewable energy projects that are smart from the start and will help diversify this country's energy portfolio in an environmentally responsible manner. The process of screening for priority projects is about focusing our staff and resources on the most promising renewable energy projects."

BLM Director Bob Abbey

In 2009, the BLM established a list of priority energy projects (referred to as "fast track" projects) for expedited application review and processing. This set of priority projects were those that had demonstrated sufficient progress toward the environmental review and public participation process to potentially be cleared for approval by December 2010, thus making them eligible for economic stimulus funding under the American Recovery and Reinvestment Act (ARRA) of 2009. In 2009, the BLM approved one geothermal priority project, and in 2010, it approved nine solar, one wind, and one geothermal priority project.

The BLM is following the same process for priority projects in 2011. Although staff and resources are focused on priority renewable energy proj-

ects, all renewable energy projects proposed for BLM-managed lands will receive the entire environmental review required by NEPA.

The BLM is also coordinating closely with land-managing bureaus, such as the FWS and NPS, in the review process. As an active partner, the FWS has made every effort to respond to BLM requests and provide species and habitat information as early in the review process as possible. Continued coordination during preparation of best management practices and mapping efforts to delineate areas not suitable for development will enhance the balanced review of energy siting, avoid impacts to natural resources, and reduce delays during project-specific review.

Specifically, the BLM, FWS, NPS, DOD, BIA, and departmental solicitors, as well as the departmental liaisons to the DOE and DOD, participate in weekly discussions and strike team meetings to address priority project issues. This coordination has allowed the agencies to address potential concerns earlier in the process. For example, issues such as golden eagle nesting near proposed wind power facilities and the presence of tortoise critical habitat have the potential to cause delays in project permitting that would impact the developers' ability to meet the deadline for ARRA financial incentives. However, early and concentrated agency coordination has resulted in a reduction of impacts to tortoise habitat and allowed further data collection for golden eagles. The coordination has occurred at multiple levels within the agencies, expediting information transfer and decisionmaking.

Priority Projects

The BLM's ongoing collaboration with the NPS and FWS and emphasis on early consultation were instrumental in the designation of additional priority energy projects announced by the BLM in March 2011.

2011 Renewable Priority Projects (19 Total)

Solar Projects
Arizona • 1
California • 8

Wind Projects
California • 3
Oregon • 2

Geothermal Projects
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Memorandum of Understanding between the Secretary of the Interior and the Governor of California to Expedite Renewable Energy Development in California

In October 2009, the State of California and the Department of the Interior reached an agreement to cooperatively develop long-term renewable energy plans and to guide eligible projects through state and Federal permitting processes that can receive 30-percent Federal tax credits under the American Recovery and Reinvestment Act (ARRA).

The memorandum of understanding commits the Federal Government and the state to a science-based process for reviewing, approving, and permitting renewable energy applications in California. The agreement also facilitates the identification of transmission corridors by December 2010 and includes the Department of Defense (DOD) in the process because some transmission lines may need to cross DOD lands. Agencies within the DOI participating in the agreement are the Bureau of Land Management and the U.S. Fish and Wildlife Service. State agencies involved are the California Energy Commission and the California Department of Fish and Game.

In addition to a broad commitment to work together, the parties of the MOU also agree to expedite projects that are on track to break ground by the end of 2010. Qualified projects that begin construction by December 1, 2011, are eligible for economic stimulus funding under the ARRA.

4.2 Onshore Energy Projects

4.2.1 Siting Projects to Protect Resources and Values

In carrying out their multiple-use missions, the BLM and USFS are dedicated to ensuring balanced management that serves the many diverse public interests and values associated with the public lands and resources. This includes the protection of scenic landscapes, ridgetops, shorelines, and other visual resources, as well as resources that are of cultural, ecological, economic, historic, and recreational value.

Balanced management of the energy resources on Federal lands is achieved through a variety of existing statutory and regulatory mechanisms. With the growing importance of energy development from the Federal lands, with advancing technology, and with the emerging role of renewable energy in the Nation's energy policy, the laws, regulations, and policies that conserve the resources and values of the public lands continue to evolve. Uncertainty requires continued diligence to monitoring and research to ensure the sustainability of ecosystems on Federal lands while also ensuring our Nation's energy future.

The resource values, uses, and issues associated with public lands are complex and vary from one geographic area to the next. These factors, along with the public's ever-increasing interest in the conservation and use of the public lands—including protection of our Nation's natural and cultural heritage—requires a deliberate and methodical approach in achieving land management decisions capable of satisfying America's diverse interests and values.

The following pages discuss the multiple steps of established comprehensive land management programs that together constitute the siting pro-

cess used to evaluate proposals for energy development. Siting criteria are dictated by legislative mandates, regulations, policy statements, land use planning decisions, and environmental mitigation reached through environmental analysis.

From planning decisions and land use authorizations to final reclamation and closure, energy projects are managed through every aspect of the land management agency's established programs. Any discussion of siting criteria begins with an understanding of this basic process.

4.2.2 Land Use Planning

Under Federal mandate, Federal resource management agencies must maintain an inventory of the lands and resources and develop, maintain, and revise land use plans, as needed over time.

- Land use plans provide the basic direction and guidance for the agencies' day-to-day management of public lands.
- Land use plans also present an opportunity to account for the need to protect special status areas, including those under the management of other agencies.
- Land use plans are subject to review under NEPA, requiring the development of EISs for major Federal actions (including most land use planning proposals and most energy development projects).

When considering a new application for an energy-related project proposal, the land manager ensures the proposal will be consistent with the area's land use plan and ensures the protection of nearby special status areas. The land manager must also ensure consistency with existing NEPA review and verify the areas or conditions for where, when, and how energy development and/or transmission can be considered on public lands.

The DOI, in conjunction with the DOE, has conducted a series of PEISs to facilitate renewable energy development on public lands that address wind energy development, geothermal energy development, and energy transmission corridors across Federal lands. The wind, geothermal, and West-wide Energy Corridor EISs are complete, and a solar energy development PEIS is now being prepared and scheduled for completion in late 2011.

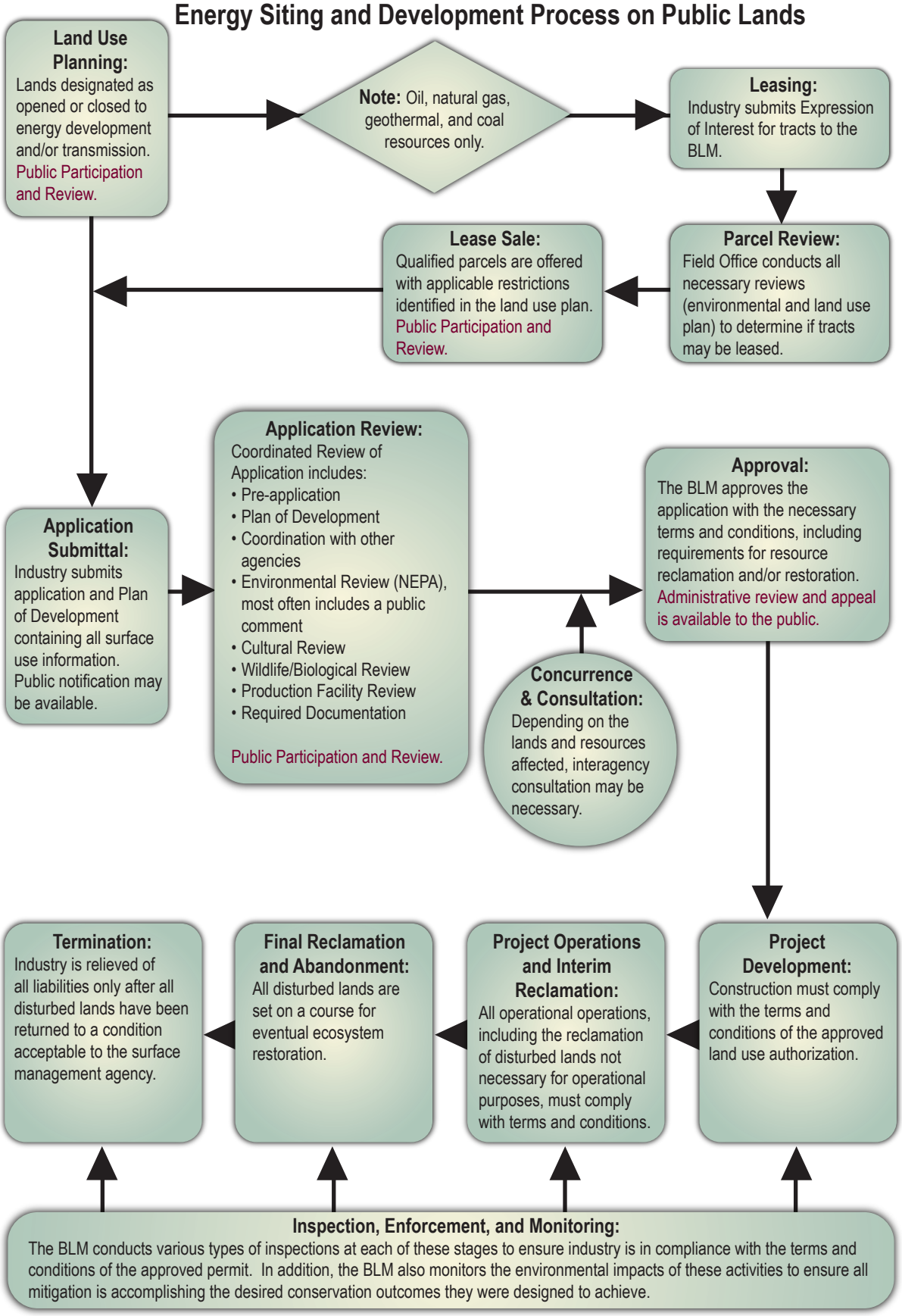
The PEISs estimate renewable energy potential, identify lands available for development, establish best management practices, amend land use plans to enable future development, and provide the broad-scaled environmental analysis needed to streamline site-specific NEPA analysis.

Land use planning includes decision criteria that are specific to energy development and transmission projects. For example, the planning process and the ultimate land use plan decision will often address the following types of determinations regarding energy development:

- Oil, gas, coal, and geothermal resources – Areas open and closed to leasing, including any constraints necessary to achieve desired conditions for multiple resources;
- Transmission, wind, and solar resources – Identification of existing and potential development areas, avoidance areas, or other constraints necessary to achieve desired conditions for multiple resources; and
- Water-energy nexus - Consideration must be given to the competition between energy development needs and water constraints, particularly in areas potentially impacted by climate change or prolonged drought.

This land use planning process is a critical first step in managing public resources with sensitiv-

Energy Siting and Development Process on Public Lands



ity toward special landscapes, coastal areas, and ridgelines—resources specifically identified in the congressional mandates for this report. Land use planning is also the first step toward developing an inventory of land use values and identifying special concerns. It is a critical juncture in accounting for the needs of adjacent state and private lands and in protecting nearby special status areas, like national parks, national trails, and national wildlife refuges.

Energy production can serve as a catalyst for nearby growth—from service facilities and workers at the facilities to the evolvement of other development due to the proximity of energy production. Of course, land use decisionmaking on adjacent non-Federal lands is the responsibility of states and localities, but energy development policies on Federal lands can influence the development on non-Federal lands. Public involvement and interagency coordination are important steps for evaluating the potential impacts, both positive and negative, of Federal energy projects on non-Federal lands and resources.

4.2.3 Public Involvement and Conflict Resolution

Public involvement is a significant element of the land use planning process to identify the appropriate multiple uses of public lands. Public involvement includes interested stakeholders, including Federal, state, tribal, and local governments and the general public, user groups, and industry who work with the land manager. Land use plans are developed using an interdisciplinary approach that balances the short- and long-term benefits of competing values and uses. The mandate for multiple use on public lands invites consideration and protection for a wide variety of uses.

The land use plan is the manager's first opportunity to resolve potential resource conflicts that may arise from multiple use management. For example, if energy development will potentially conflict with habitat conservation for a given wildlife species, spatial and temporal constraints or specific reclamation standards may be imposed on future energy development proposals to meet the goals and objectives for wildlife habitat and energy development. Or, if potential energy development will conflict with treasured viewsheds, an area may be determined inappropriate for energy development, and an alternative, more suitable area may be proposed.

In the absence of alternatives for protecting conservation values, the land use plan may administratively ensure resource protection through special designations, such as ACEC designation, which may close an area to public use or place limitations on public access and activity.

4.2.4 Environmental Review

As discussed above, establishing a land use plan is a major Federal action requiring the preparation of an EIS pursuant to NEPA. Therefore, the agencies must analyze and disclose to the public the potential environmental effects that may result from the decisions made in a land use plan. The analysis also evaluates the effectiveness of any mitigation measures that are being considered to offset potential environmental impacts. The goal is to select the alternative that best represents balance between resource conservation and use, and responds to the Nation's various needs.

Proposals found to be compatible with the management direction provided in a land use plan are then subjected to a permitting process. The process generally follows fairly consistent steps to ensure the proper siting, mitigation of impacts, and establishment of appropriate terms and conditions a proponent must satisfy for the use of public lands and resources. The following dis-

cussion describes, in general terms, the complex process involved at the site-specific level when siting and mitigating the impacts from energy-related projects.

4.2.5 Permit Applications and Review

Prior to implementing energy-related projects on public lands, the project proponent must first obtain authorization to do so. Depending on the type of energy source being developed, issuance of a Federal lease may first be required.

The resources that require the issuance of a Federal lease include oil, natural gas, geothermal, and coal. Wind and solar generation facilities and transmission lines do not require the issuance of a lease but are approved in the form of a land use authorization under Title V of the Federal Land Policy and Management Act. However, rights-of-way approval can include a competitive process subject to payment of bonus bids similar to programs with leasing requirements.

Application Screening

In February 2011, Secretary Salazar announced a series of additional initiatives to encourage rapid and responsible development of renewable energy from public lands. Among the initiatives is additional guidance by the BLM for pre-application and screening of proposed solar and wind energy projects.

To ensure early coordination with Federal land managers and stakeholders before significant resources are committed to processing right-of-way applications for solar or wind energy projects, the BLM will accept applications only after pre-application meetings have been held. This measure will help screen out projects with the most serious potential environmental conflicts, while placing priority on applications with the highest likelihood of success in the permitting process.

The BLM's screening and prioritization process will help direct development to low-conflict areas such as previously disturbed sites, areas adjacent to disturbed sites, and locations that minimize construction of new roads and/or transmission lines.

In all cases, energy development and transmission proposals must undergo an official review involving matters pertaining to land tenure, land use plan conformance, other uses already authorized, as well as another level of NEPA environmental review to evaluate the site-specific impacts associated with the development proposal. No ground-disturbing activities may take place until the land manager gives approval.

Both the BLM and the USFS have detailed regulations prescribing specific steps for permitting processes that, although subject to individual variances from one energy resource to the next, follow a similar course of action. These processes require proponents to submit detailed information regarding the land uses involved with their development proposal, also known as a plan of development, which will then be used during the environmental and land use plan conformance review conducted by the local land manager when processing a permit.

Before approving an energy project, an interdisciplinary team of resource specialists will conduct necessary on-the-ground assessments to determine the presence of and potential impacts to other resource values within or in proximity to a given project. Each proposal must conform with the management requirements prescribed in the land use plan, and each proposal must conform with any additional requirements or mitigation measures that may be required as a result of site-specific environmental analysis under NEPA.

Following completion of the environmental and permitting process, the applicant will receive a

use authorization that describes all uses that have been approved related to a commercial energy development project, or the application can be denied. An approved use authorization will include onsite access roads, electrical and distribution facilities, and other support facilities. The approval will define which lands are involved in the development and specific descriptions on how the project will be configured.

The land use authorization also details:

- Bonding and reclamation requirements;
- Due diligence requirements;
- Terms and conditions; and
- Use fees and rents.

The siting process for energy projects includes consideration of special resource values such as:

- Visual resources – protection for scenic landscapes;
- Wildlife and migratory birds;
- Cultural resources; and
- Endangered species.

Recognizing the sensitivity of these special resources, the Departments have established specific processes and policies for their protection.

4.2.6 Water Resources

Energy production and water supply are inextricably linked. Recognizing this relationship, on February 22, 2010, Secretary Salazar issued Order 3297 directing DOI bureaus to adopt criteria that identify and support projects and actions that promote sustainable water strategies. The energy/water nexus is identified in the order and acknowledges that DOI bureaus should identify how much water is used for various energy production technologies and incorporate such information into decisionmaking on the development of energy and water resources. Federal agencies responsible for approving new energy development need to account for the demand that this development places on available water supplies and assess the impact on surface and ground water quality.

The total use of water for new renewable energy projects should be considered. The amount of usage will depend on the specific technology proposed. This new demand needs to match available water supplies. Both physical and legal availability of water supplies are significant factors. Also important is the quality of the available water supplies. Often low-quality, brackish groundwater aquifers are locally available. However, energy production generally requires a higher quality, fresh water supply. To meet this requirement, water may need to be transported over significant distances or poor quality water may need to be treated prior to use. The energy required to transport and/or treat required water supplies should be factored into the overall net energy produced by the proposed development.

The responsibility to allocate water supplies is held by states, and in much of the West, surface water supplies are already fully allocated. Groundwater appropriation laws vary by state. In some states, groundwater development rights lie with the landowner, and in other states, groundwater development requires the issuance of state water use permits. Federal agencies permitting new energy development should take into account these state water allocation processes. Water quality impacts may not be governed by existing regulatory regimes. Both the impact of these changing water

uses and the time and risk that these changes represent should be considered when evaluating the feasibility of new energy production.

Finally, sustainable water supply reflects the overall water demand and supply condition. In any region, water is required for people, crops, the environment, and the economy. In drought years, water supplies may already be inadequate to meet the cumulative demand for existing uses. Further, legal allocation of water often results in certain uses having full supplies while other uses face shortage. New energy development needs to fit within these constraints. As new energy development occurs on Federal lands, managers should seek opportunities that lead toward a sustainable water future.

4.2.7 Protecting Scenic Landscapes

While managing public lands for multiple use, Federal resource management agencies must ensure that many different resource values are protected. Among these are scenic values of landscapes that are treasured by all Americans. The Federal Land Policy and Management Act directs the BLM to protect scenic values, maintain an inventory of scenic values, and minimize damage to scenic values.

The BLM and USFS follow a systematic and objective process for addressing visual impacts that may result from surface-disturbing activities (renewable energy, oil, gas, minerals, etc.) proposed for development on Federal public lands. The BLM established its current Visual Resource Management (VRM) policy in the 1980s, which stems from NEPA and the Federal Land Policy and Management Act. The USFS's Scenery Management System (SMS) is similar in nature and emphasis to the BLM's VRM.

The objective of the VRM and SMS programs is to manage areas of high scenic value and visually sensitive settings on public lands in a manner that protects these qualities and values. The policies encourage using basic landscape design principles for visually integrating proposed development into the landscape setting. Designers use the basic design elements of form, line, color, and texture to describe and evaluate landscapes and then incorporate these qualities into the design of landscape modifications. Changes in a landscape that repeat the landscape's basic elements are said to be in harmony with original surroundings.

Shared Viewsheds Protecting Visual Resources

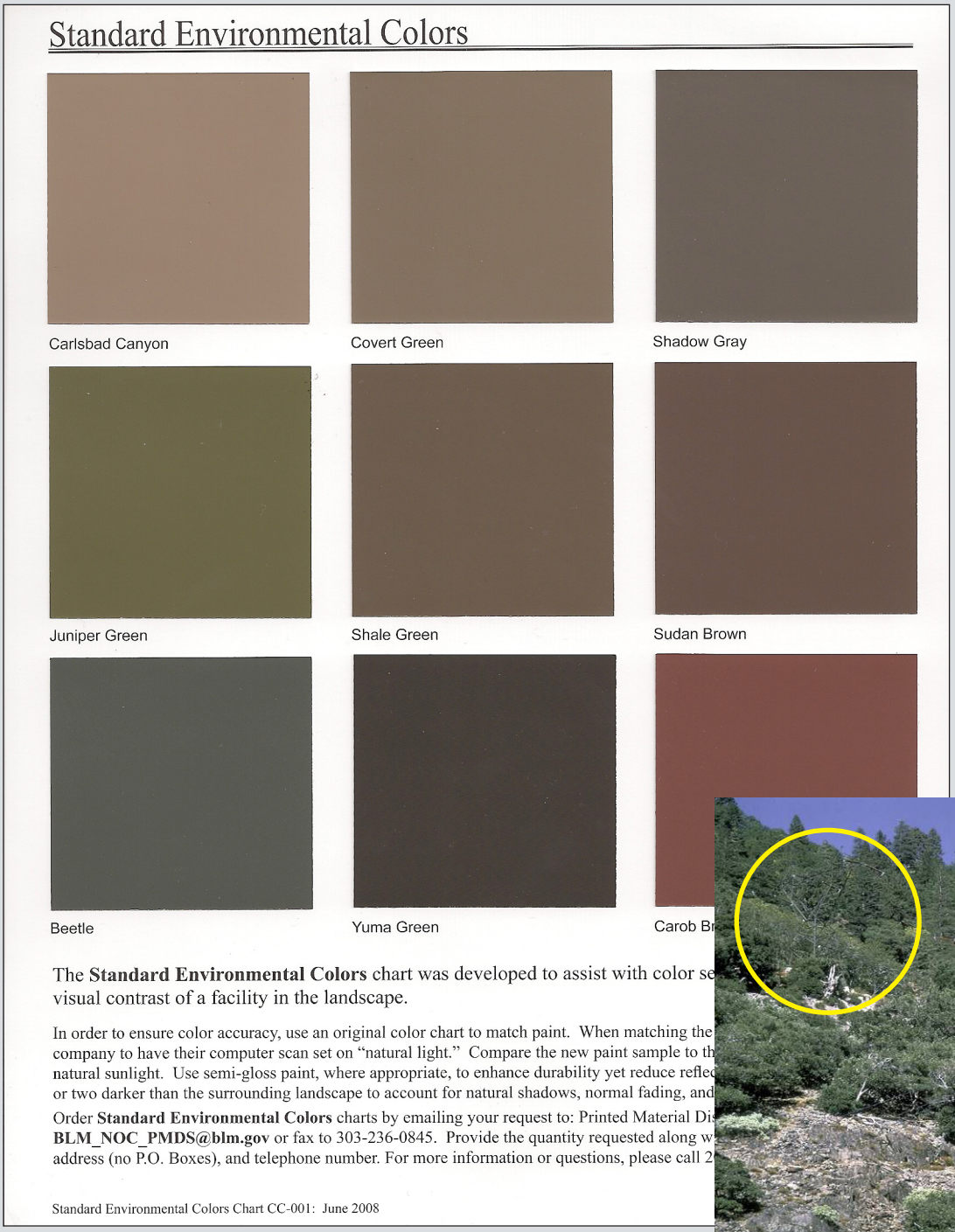
The BLM acknowledges that its administrative boundaries are often a part of an extended viewscape shared by adjacent land management jurisdictions, such as the NPS.

The BLM visual resource inventory teams are actively contacting respective NPS units and engaging with their administrators to review the degree of visual sensitivity reaching beyond their boundaries. The BLM assesses visual impacts, develops impact mitigation strategies, and then incorporates that information during land use decision making.

The BLM is also reaching other interested agencies in an attempt to facilitate a common understanding on the principles of visual resource management and implementation procedures to help achieve our respective land management objectives.

Illustration of Visual Resource Management Concepts

Structures and Color Selection



The Standard Environmental Colors Chart provides guidance on color options to visually adapt facilities into the landscape setting.

Proper color selection can dramatically reduce the visual presence of facilities that would otherwise dominate the landscape.

The VRM system involves inventorying scenic values and establishing management objectives for those values during the resource management planning process. The BLM then evaluates proposed activities to determine whether they conform with the management objectives. The system also accounts for shared treasured landscapes associated with adjacent lands, which is a new innovation of the VRM system. For example, in undertaking new visual resource inventories as part of the solar PEIS, the BLM is working closely with the NPS to ensure that viewsheds associated with parks are considered.

Visual impact mitigation for energy facility siting involves objective analysis of the visual character and natural landscape setting, development of land use objectives to help determine allowable visual change, and monitoring energy development compliance with the land use visual management objectives.

For further discussion of the VRM program, see Appendix 6.

4.2.8 Wildlife and Migratory Birds

With the increased demand for all forms of domestic energy production, wildlife resource management will be one of the greatest challenges. While supporting development of domestic energy resources, the American people rightfully expect Federal resource management agencies to continue to provide adequate protection of wildlife and habitat. Thus, a principal objective in siting energy facilities is to avoid, minimize, or mitigate the impacts of energy development activities on wildlife species, the strength of their populations, and the health of their habitat.

The potential impacts of land use activities often determine the more immediate and near-term priorities for wildlife management, as demonstrated by the recent measures taken by the DOI for the conservation of sage-grouse and their habitat.

Where changes in wildlife habitat seem likely, efforts are focused on maintaining the quality of such habitats or developing alternative habitat areas for the priority species involved. Federal wildlife programs regularly consult and coordinate with state fish and wildlife agencies in maintaining credible and effective wildlife components for all resource development programs. As energy development is analyzed and approved, operators are required to take a number of actions to ensure protection of wildlife values.

The following are examples of wildlife resource management requirements for wind energy projects. Similar requirements have been established for other forms of energy development. Additional site-specific mitigation measures are developed based on findings from NEPA analysis.

- Operators are required to review existing information on species and habitats in the vicinity of the project area to identify potential concerns. They will coordinate with the FWS, NMFS, and state agencies to obtain the most recent information on species and habitats.

- Operators must conduct surveys for Federal and/or state-protected species and other species of concern (including special status plant and animal species) within the project area and design the project to avoid (if possible), minimize, or mitigate impacts to these resources. The BLM and USFS will review survey plans and consult with the state wildlife agency, FWS, or NMFS prior to survey approval and implementation and will prohibit the disturbance of any population of federally listed plant species.

Conserving Sage-Grouse Habitat

While guiding and managing new conventional and renewable energy projects, the DOI has expanded efforts with state, tribal, and local partners to identify lands that are vital to the survival of the greater sage-grouse to reduce impacts on the species.

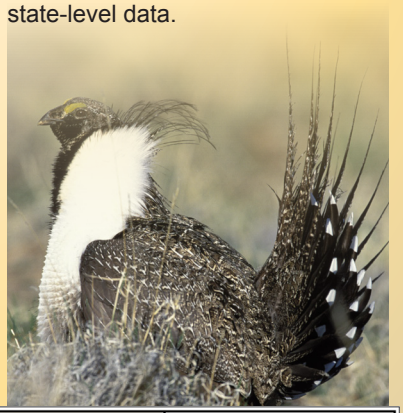
In addition, the FWS recently announced a finding that the greater sage-grouse warranted listing as a threatened or endangered species under the Endangered Species Act, but the listing is precluded by higher priority listing actions.

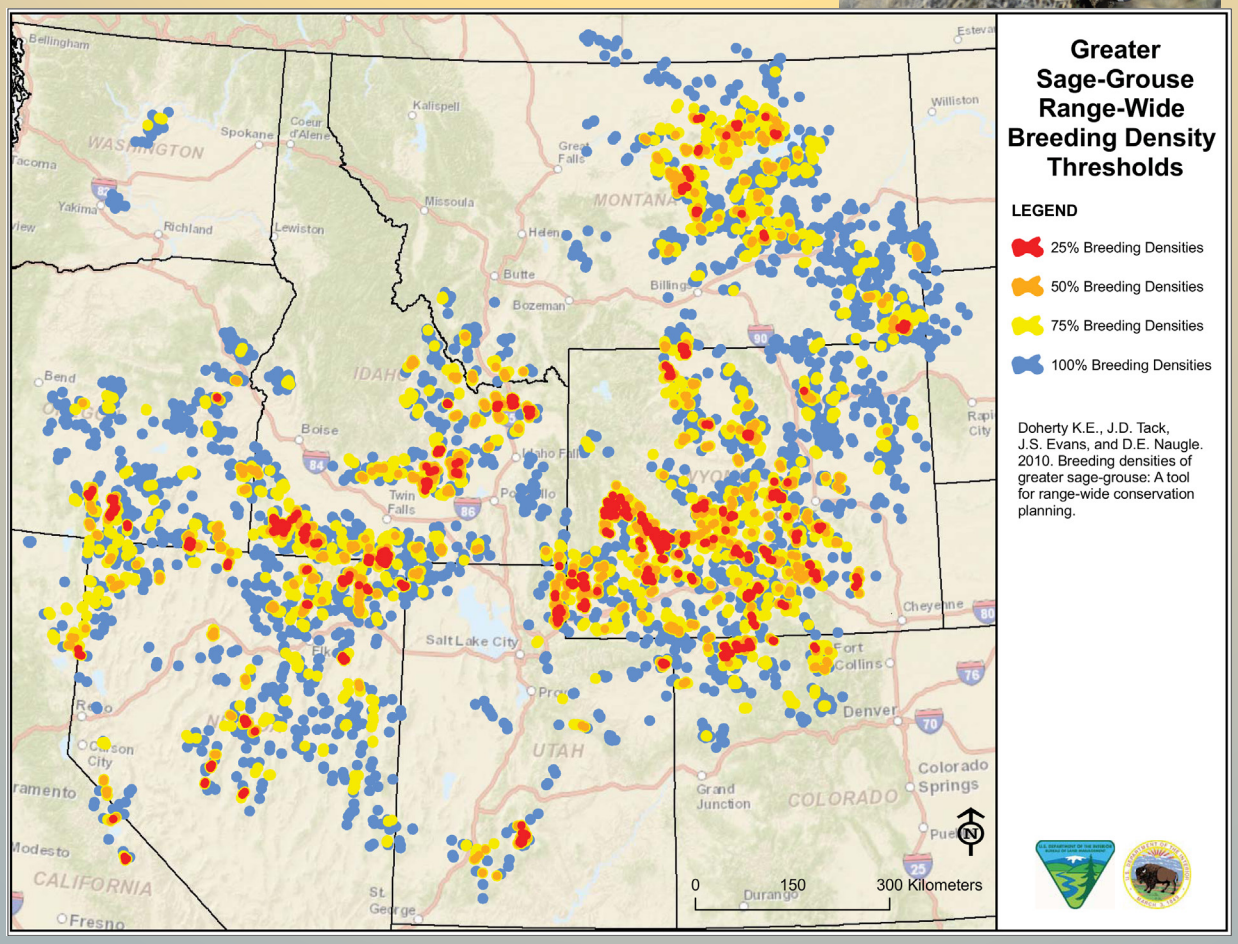
The BLM, which manages more sage-grouse habitat than any other government agency, announced guidance that will expand the use of new science and mapping technologies to improve land use planning and develop additional measures to conserve sage-grouse habitat while ensuring that energy production, recreational access, and other uses of Federal lands continue as appropriate.

In November 2010, Secretary Salazar announced the completion of a breeding bird density map for the greater sage-grouse that will serve as a critical tool for enhancing the sustainability of sage-grouse populations.

The map was developed by the BLM in coordination with the Western Association of Fish and Wildlife Agencies, the FWS, and the Natural Resources Conservation Service.

The map identifies important rangewide focal areas having high-density occurrences of greater sage-grouse and will be instrumental in identifying land uses that do not compromise these habitat areas. The BLM will work with state fish and wildlife agencies to further refine the map by incorporating additional specific state-level data.





- Operators of wind projects must evaluate avian and bat activity in the project area and design the project to minimize or mitigate the potential for bird and bat strikes. Scientifically rigorous avian and bat use surveys will be conducted; the amount and extent of ecological baseline data required will be determined on a project basis.

- If site studies show that the proposed placement of turbines would pose a significant risk to raptors, turbines will be configured to avoid landscape features known to attract raptors.

- Operators must determine the presence of bat colonies and avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies; in known migration corridors; or in known flight paths between colonies and feeding areas.

- Operators must determine the presence of active raptor nests (i.e., raptor nests used during the breeding season). Measures to reduce raptor impact at a project site (e.g., minimize road cuts, maintain either no vegetation or non attractive plant species around the turbines) are considered.

- A habitat restoration plan must be developed to minimize or mitigate negative impacts on vulnerable wildlife, while maintaining or enhancing habitat values for other species. The plan will identify revegetation, soil stabilization, and erosion reduction measures that must be implemented to ensure that all temporary use areas are restored. The plan will also require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery of natural habitats.

Preserving Night Sky Integrity

For obstacles more than 200 feet in height, the Federal Aviation Administration (FAA) requires placement of continuous flashing lights at night to warn aircraft pilots of danger.

The BLM and FAA are researching and evaluating the application of on-demand audio/visual warning systems technology as an alternative means to warn aircraft pilots of potential risk.

The research may identify alternatives that will help preserve night sky integrity in rural landscape settings.

This technology may also lead to opportunities for mitigating visibility of obstacles during daylight hours as well.

- Procedures will be developed to mitigate potential impacts to special status species. Such measures could include avoidance, relocation of project facilities or lay-down areas, and/or relocation of special status species.

- Facilities and structures will be designed to discourage bird perching or nesting. For example, power lines and poles will be configured to minimize raptor mortality and discourage raptor and raven nesting and perching.

4.2.9 Endangered Species Act Compliance

For renewable and conventional energy development, a wildlife review assesses the impact of

proposed energy surface disturbance activities on wildlife habitat, vegetation, and land cover by conducting onsite wildlife surveys or reviews of contract wildlife survey information submitted by the project proponent. Under provisions of Section 7(a)(2) of the Endangered Species Act, a Federal agency that permits, licenses, funds, or otherwise authorizes activities must consult with the FWS and/or NMFS to ensure that its actions will not jeopardize the continued existence of any listed species. If listed species are present, the Federal agency must determine whether the action may affect the species.

A "may affect" determination includes those actions that are not likely to adversely affect as well as those likely to adversely affect listed species. If the Federal agency determines that the action is not likely to adversely affect listed species, and the FWS and/or NMFS concurs with that determination in writing, then no further consultation is required. If the Federal agency determines that the action is likely to adversely affect listed species, then it must request initiation of formal consultation. The Federal agency, or its designated representative, prepares a biological assessment describing the project, potential impacts of the project to federally listed species, and methods to avoid and minimize those impacts. Once the FWS and/or NMFS accepts the biological assessment as complete, formal consultation begins, and the FWS and/or NMFS prepares a biological opinion. The biological opinion is the document that states the opinion of the FWS and/or NMFS regarding whether or not the Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. It also contains measures to further reduce impacts to species and their habitats. These measures are often included in permit conditions in order for the operator and Federal agency to remain in compliance with the Endangered Species Act. If the Federal action agency or operator fails to follow the permit conditions, then corrective actions may be taken by the permitting Federal agency.

4.2.10 Cultural Resources

The Departments employ numerous measures to protect our Nation's cultural resources. All proposed actions on Federal lands, including renewable and conventional energy development, must comply with Federal laws, regulations, and policies protecting our collective heritage. Major laws include the National Historic Preservation Act (NHPA) (specifically, Section 106), NEPA, and the Native American Graves Protection and Repatriation Act.

Each of these laws specifically addresses the protection of cultural resources. Section 106 of the NHPA, for example, directs Federal agencies to take into account the effect that any proposed action may have on significant cultural resources and to provide the Advisory Council on Historic Preservation the opportunity to comment with regard to such undertakings. The DOI and USDA have long-established policies and procedures to comply with the NHPA and other pertinent laws and regulations, and to accomplish the consultation necessary to fully comply with these mandates in considering and protecting the cultural resources on their lands.

4.2.11 Avoidance and Exclusion Areas: National Parks and Other Protected Lands

Under Federal law, energy development is generally not permitted within the boundaries of a number of special status areas, such as national parks and designated wilderness areas.

A matter of policy, the BLM and USFS do not consider energy development on lands where

such development is incompatible with specific resource values. Additional areas of land may be excluded from development on the basis of findings of resource impacts that cannot be mitigated and/or conflict with existing and planned multiple-use activities or land use plans such as:

- Critical habitat for threatened and endangered species designated by the FWS
- Rights-of-way exclusion and avoidance areas, no surface occupancy areas
- Special recreation management areas

In addition, the BLM has recently issued guidance for pre-application and screening of proposed solar and wind projects. Pursuant to this guidance, any proposed development located near or adjacent to lands designated for protection—such as a unit of the National Park System or the National Wildlife Refuge System—which may be adversely affected by the proposed project, will be considered to have a high potential for conflict.

4.2.12 Consultation Among Agencies

The consultation process includes other Federal and state agencies, such as the state historic preservation offices and the state fish and game agencies. These agencies provide valuable input into land use plans and project-specific review. The site-specific environmental analysis for a project is often one of the best opportunities for interagency consultation and usually includes a public review process.

For example, consultation by the BLM with the Department of Defense (DOD) has resulted in the establishment of a wind energy protocol that outlines a framework for early cooperation and participation for assessing the impacts pertaining to the siting, construction, and operation of wind energy facilities. The protocol establishes a process for DOD to review and comment on proposed wind energy applications and for developing mitigation measures to minimize impacts on military activities.

4.2.13 U.S. Fish and Wildlife Service and National Park Service Project Participation

Fish and Wildlife Service

The FWS coordinates with the BLM, USFS, other agencies, and the private sector on all types of energy projects and at multiple levels, including at the project, regional, and national levels. The FWS network of field offices provides on-the-ground assistance with project planning and impact assessment, including endangered species consultation, while regional and Washington offices provide coordination and policy guidance.

The BLM and FWS established jointly located offices under Section 365 of the Energy Policy Act of 2005. These offices review oil and gas projects on BLM lands. As described in the 2009 Report to Congress, the offices have reduced review time of oil and gas extraction applications, improved Federal coordination, and reduced impacts to fish and wildlife and their habitats. The FWS staff has gained a technical understanding of oil and gas extraction not possible in standard field offices, and BLM staff has direct and immediate access to FWS staff that also is not always possible in field offices. Based on this experience, the BLM and FWS anticipate expanding this concept of jointly located offices to include renewable energy sources. This will reduce interagency coordination delays, particularly considering the backlog of applications.

For example, early and concentrated coordination between the agencies has resulted in a reduction of impacts to tortoise habitat and further data col-

lection for golden eagles. The coordination has occurred at multiple levels within the agencies, expediting the transfer of information and decision making.

National Park Service

While most units of the National Park System and other areas under NPS management authority are protected by law from the siting of energy development on Federal lands and waters within their boundaries, they are not immune to the spillover effects of that development outside their boundaries.

The NPS works with other agencies within the DOI, other Federal agencies like the USFS, and FERC to ensure that energy development occurs in appropriate locations using appropriate technologies. Where potential spillover effects to parks and other special areas are identified, the NPS recommends that actions be taken to address them. Park protection concerns may include: adverse impacts to park water quality and quantity, including ground water; air quality at the local and regional level; wildlife and wildlife habitat, including wildlife migration corridors; viewsheds; soundscapes; night skies; cultural resources; and historic landscapes.

As the Nation's park expert, the NPS brings considerable expertise to bear in the decisionmaking processes of other agencies that could affect park resources. Early consultation allows park resource protection concerns to be raised early in the decisionmaking process, and creates greater flexibility for identifying needed mitigation, including alternative siting locations.

4.2.14 Inspection, Enforcement, Monitoring, and Compliance

Following project approval, the land management agencies perform a range of follow-up inspections to ensure all aspects of a given project are implemented according to the terms and conditions of their approved permit. This includes all the mitigation measures identified through the various levels of environmental review. If a violation is identified, the agencies will enforce compliance to ensure the proponent takes appropriate actions to abate the violation and return to compliance.

4.2.15 Final Closure and Reclamation

All proponents are required to reasonably demonstrate that they possess the technical and financial capability to carry out the projects proposed. They are also required to provide financial sureties that would compensate for any unreclaimed resource damage or loss that may occur. This compensation is accomplished through a bond. Each of the Federal energy programs has regulatory bonding requirements that must be met prior to project approval. The standards for these bonds vary from one program and/or project to the next.

Once a project has reached completion of its useful life, proponents are required to complete full reclamation to the satisfaction of the authorized officer. This typically includes removal of roads and facilities, site stabilization, rehabilitation, and revegetation. Reclamation is not complete until approved by the authorized officer of the respective land management agency.

4.2.16 Coordinating with Tribal Governments

Tribes, as independent governments, have the right of consent for all development projects on tribal land. With this in mind, the DOI works across all its bureaus to assist tribes and individual Indian landowners with the development of their energy resources. Only when tribes seek approval for energy development projects that have the potential to impact trust resources, do DOI

bureaus become directly involved in the process of evaluating the potential impacts and determine how and when the projects should move forward. In these cases, the DOI has a trust responsibility to ensure that any proposed projects are consistent with all Federal statutory authorities related to the protection of the environment, cultural, and historical resources. Until the point that tribes seek approval, the DOI plays an advisory role working with tribes to provide technical assistance to determine the extent and magnitude of potential energy resources, economic evaluation of proposed development projects, and analysis of the long-term consequences to the natural and cultural environment of any potential development in Indian country.

To accomplish its trust responsibilities, all DOI bureaus have tribal liaisons who work directly with individual tribes regarding a range of technical assistance areas. The DOI also regularly convenes an internal committee that coordinates regulatory policy and evaluates internal resource needs and allocation related to the development of energy and mineral resources. In addition, a Tribal Energy Policy Advisory Committee (TEPAC) serves as an advisory board for the Assistant Secretary of Indian Affairs to make recommendations about the implications of Federal policy with regard to energy development in Indian country. TEPAC membership consists of tribal governmental leaders, senior managers from DOI bureaus, and senior-level managers from the DOE, EPA, and USDA.

4.3 Strategic Planning and Interdepartmental Coordination for Renewable Energy Projects

Congressional Direction:

The report should also provide a detailed strategic plan on how the Department and the Forest Service will coordinate the development of such projects particularly in areas where there is mixed ownership of Interior and Forest Service lands.

House Report 111-316, Renewable Energy and Public Lands

4.3.1 Overview

Although there are very few proposals for joint USFS/BLM renewable energy development, the two agencies have a long history of cooperating on projects along shared boundaries and on long linear projects, such as electric transmission lines and pipelines, that cross both agencies' lands. Future joint projects will likely involve potential geothermal or biomass energy. Throughout the development of these two agencies, the USFS and BLM have worked jointly in establishing energy programs that are complementary and easily coordinated. This long history of interagency coordination, centered on strategic objectives, provides a solid foundation for broader and longer-term strategic planning across areas of renewable energy development where the missions and jurisdictions of the two agencies converge.

Strategic planning for renewable energy development centers on two fundamental elements that will determine the overall success of the program. These are (1) the optimal siting of renewable energy sources and (2) the optimal transmission of

energy from renewable energy sources across Federal lands to end users.

With the growing interest in renewable energy, the BLM has received more than 400 applications to develop new renewable energy projects on public lands. Strategic planning recognizes, however, that the key to effective renewable energy development is not in the number of project applications received, but in the scale of projects brought forward, their placement in relation to existing and planned transmission capabilities, and potential resource conflicts. This requires a planning and development model completely different from the application-based cost recovery model for other forms of energy development.

For renewable energy, effective decision making involves consideration of siting, scale, and planned transmission capabilities in advance of making sites available for development. The ability to apply such considerations also requires a much higher level of upfront planning and analysis, which entail costs that do not fit the existing cost recovery model. Moving away from the application-based cost recovery process can shift the focus of management and coordination toward areas of highest renewable energy potential where environmental risks can be accounted for and addressed.

As part of the strategic planning effort, the BLM is working with other agencies and stakeholders to define Federal renewable energy zones in which to coordinate development and transmission projects. This is critical to ensuring that projects with high production potential are given priority for siting in locations that are near existing and planned transmission capability, and in areas with lower potential environmental impact.

New Funding to Meet the Challenge: The American Recovery and Reinvestment Act

BLM Renewable Energy Studies and Support

NEPA Analysis Total of $13 million

- Solar EIS and Study Areas

Studies	**Total of $28 million**
• Land Reuse	$1.7 million (AZ)
• Wildlife/Ecological Assessments	$3.25 million
• Cultural/Paleo Studies	$0.745 million
• Visual Resources	$2.39 million
• Technical Support	$0.615 million
• Updating Case Records	$8.6 million
• Land Status (GIS/Geographic Coordinate Data Base)	$10.7 million
Total Supporting Renewable Energy	**$41 million**

4.3.2 The Opportunity

The ARRA has made significant additional funds available to industry, communities, and state and Federal agencies to support renewable energy initiatives. The availability of these funds has produced a surge of inquiries as well as applications. By getting in front of this wave, the DOI has prioritized projects to ensure that large-scale, near-term, and well-financed solutions are given priority for development in the areas of highest energy potential and minimal environmental impact.
Moving away from the application-based approach allows better control in prioritizing sites

for expedited development of large-scale renewable energy projects. The most effective way to meet this objective is to complete the required environmental analyses upfront, in advance of offering sites for project application.

The BLM has been able to implement this change because of significant additional funding provided in the ARRA and the FY 2010 Appropriations Act. Funding provided under these measures covered the upfront costs of hiring new staff, preparing the necessary environmental documents, conducting the appropriate studies, and improving information available to industry and the public to support their future decisionmaking and monitoring requirements.

4.3.3 The Plan

The BLM plan is to get in front of the demand for new renewable energy applications and to phase these applications to better match transmission planning that is also underway. The BLM will move decisively away from the previous application-by-application, rights-of-way-oriented funding, and processing procedures toward a coordinated regional focus in developing renewable energy potential. By focusing resources on areas with the greatest potential for renewable production with reduced environmental conflicts, and by coordinating with transmission planning, the BLM expects to transmit renewable energy to the end user more quickly. The DOI has established a performance goal of approving 9,000 MW of new renewable energy production capacity by the end of 2011.

4.4 Transmission Requirements and Siting for Renewable Energy

Congressional Direction:

The report should identify specifically what areas of the public lands and the Outer Continental Shelf will be considered for projects based on:

(2) What additional transmission lines will be necessary to connect these new sources of power to the energy grid;

(3) Where these transmission lines will be placed.

House Report 111-316, Renewable Energy and Public Lands

4.4.1. Overview

Planning for transmission is essential to identify what facilities are needed and to determine the appropriate locations for these facilities. The DOI and USDA do not have a primary role in transmission planning, which is a technical exercise based on many factors outside the purview of DOI and USDA land management authorities. Transmission planning is conducted by the DOE, FERC, and numerous local and regional entities, such as the Western Electricity Coordinating Council. However, the DOI and USDA are involved in both short- and long-term land use planning to identify the preferred locations on the lands they manage for major transmission projects.

Improvements to the national electricity grid are important for promoting renewable energy for two major reasons. First, sources of industrial-scale renewable energy generation are often in locations that are not well-served by transmission lines. Second, the national electricity grid must be

robust to meet reliability standards as intermittent sources of energy are integrated into the system.

The DOI and USDA are striving to provide access to remote renewable sources and to enhance the national electricity grid to ensure reliability as sources of renewable energy are brought online. The Departments are meeting these challenges through their land use planning processes and through improvements to project siting and permitting reviews. The Departments continue to work closely on these efforts with other Federal agencies, tribes, states, and other entities.

The DOI designated more than 5,000 miles of energy corridors on BLM lands as directed by Section 368 of the Energy Policy Act of 2005. These corridors link to 1,000 miles of additional corridors designated by the USFS, providing a network across much of the Federal land in 11 western states.

Designated energy corridors allow applicants for renewable energy projects the opportunity to move more quickly through the siting process. The designated corridors also provide land managers with a tool to consolidate project locations across the landscape. Corridors exist in locations that avoid, to the maximum extent possible, known resource conflicts. Projects that are sited within corridors will still be subject to full site-specific environmental review. As more information becomes available from stakeholders and ongoing regional and local planning efforts, the DOI and USFS will continue to monitor, revise, update, and adapt the network of corridors as appropriate.

The Departments will also continue their active participation and leadership in regional transmission planning, which helps guide land use planning efforts. For example, the DOI will continue to work closely with California's Renewable Energy Transmission Initiative process and the Western Governors' Association's Western Renewable Energy Zones initiative. The DOI will also participate in the Interconnection-Wide Transmission Planning Initiative funded by the DOE through ARRA funds and awarded to the Western Electricity Coordinating Council and the Western Governors' Association.

Siting and authorizing major, long-distance transmission facilities require developers to coordinate with many different agencies, which can be a lengthy and difficult process. To enhance efficiency and coordination in siting and authorizing electric transmission facilities among all involved Federal agencies, the Secretaries of the Interior, Agriculture, and Energy and the FERC Commissioner established an interdepartmental working group to improve the siting and authorization process among Federal agencies for electric transmission projects. The result was an interagency MOU executed by nine Federal agencies in October 2009 that commits these agencies to close coordination and a number of other procedures to improve the Federal process under existing authorities. The participating agencies are working together to implement the memorandum's provisions.

The BLM and USFS continue to seek innovative solutions to impediments as they evaluate applications for large and complex projects. For example, the BLM is working closely with the State of Wyoming and its agencies and other Federal agencies to identify common challenges such as system reliability, multiple levels of approvals, and the lack of impact-free routes. This partnership will develop and implement solutions and consistent policy approaches to address these challenges through existing applications and demonstration projects.

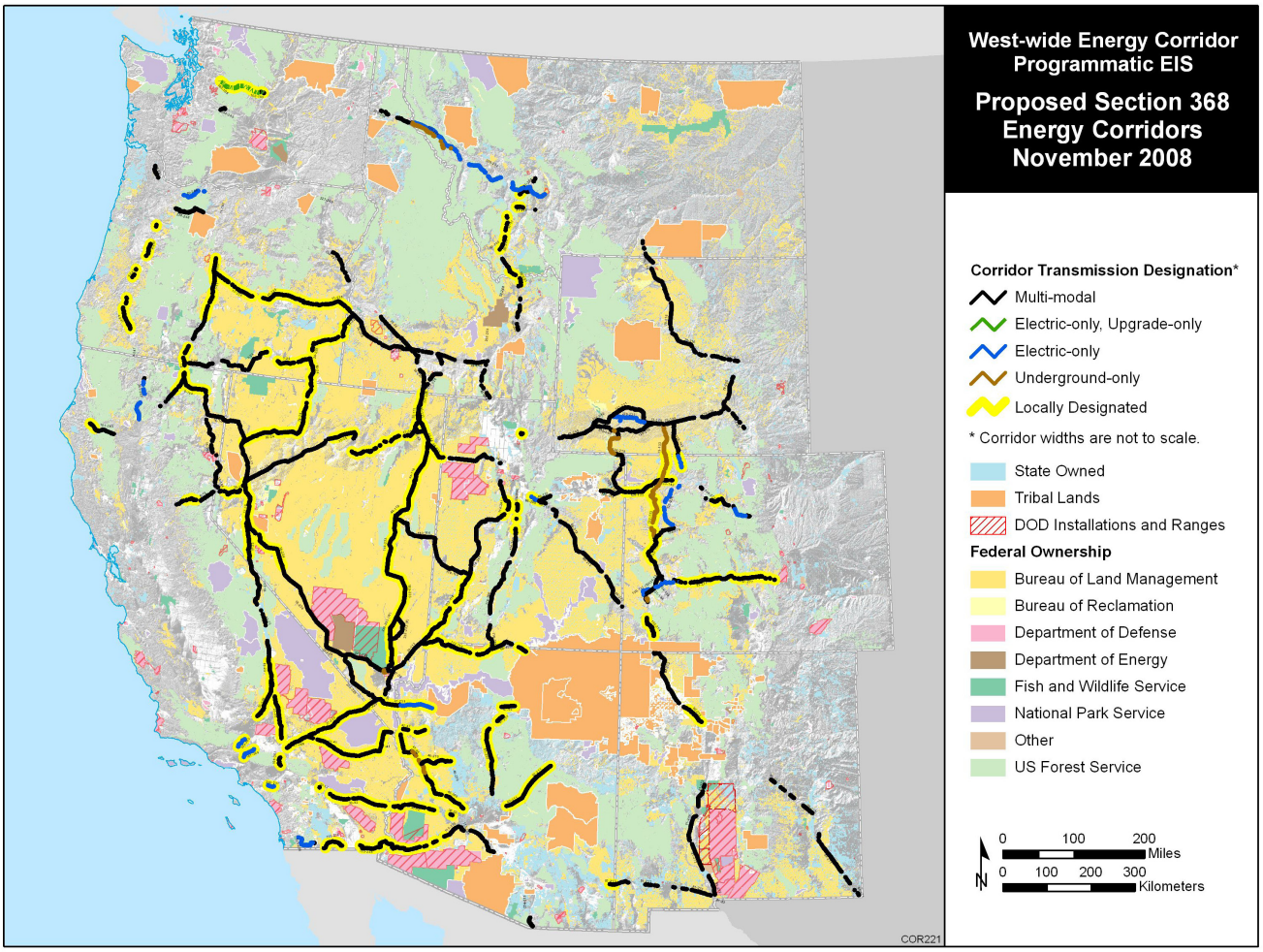
4.4.2 Siting Transmission on U. S. Forest Service Lands

The USFS receives thousands of requests per year for various uses, including the siting of electric transmission lines. Very few new electric transmission lines have been constructed in the western United States over the last two decades. Today, that situation is rapidly changing.

The corridors, established to avoid the proliferation of utility corridors crossing Federal land, improve transmission and overall reliability of the Nation's energy transmission infrastructure. Almost 1,000 miles of corridors designated on NFS lands connect with those established on BLM lands and represent the preferred locations for electric transmission and oil and gas pipelines on NFS and BLM lands. Applicants are encouraged to site within these and other existing corridors to avoid corridor proliferation, minimize environmental impacts and controversy, and accelerate the siting approval process.

The energy corridor project for the remaining 39 states, currently underway, will identify corridors for the potential siting of transmission lines on NFS land, as well as opportunities to consolidate rights-of-way. At this point, it is too early in the process to project or even estimate the potential number of energy corridor miles that could result from this project.

Proposed Transmission Corridors



A reasonable estimate for transmission and distribution increases crossing NFS lands is about 10 percent more than the existing capacity of 14,400 miles currently installed on NFS lands. To connect the electricity generated from renewable energy resources to the grid, it is important to know the estimated capacity. Currently, 19 major transmission projects are in varying stages of development (ranging from NEPA analysis to construction). The agency has received 35 applications for transmission and distribution and anticipates renewing approximately 71 permits.

4.5 Methodology Used to Limit Short-Term and Long-Term Impacts

Congressional Direction:

The report should identify specifically what areas of the public lands and the Outer Continental Shelf will be considered for projects based on:

(4) The methodology to be used to limit the size of solar troughs and photovoltaic facilities.

House Report 111-316, Renewable Energy and Public Lands

4.5.1 Landscape Assessment Inititatives

The DOI recognizes that renewable and conventional energy development on a large scale can impact important natural resource values, including treasured landscapes, sensitive wildlife habitats, limited surface and groundwater resources, and existing land uses. The DOI is working to understand and address the implications of energy development in the context of these overall landscape values. The DOI's goal is to minimize potential impacts by siting future energy projects in a responsible, environmentally sound manner, and by focusing environmental mitigation and conservation efforts where they are most needed and beneficial.

To assist the DOI in meeting the goal of responsible energy development, the Secretary of the Interior launched two new initiatives that provide a framework for coordination among the DOI bureaus and integration of the DOI's expertise

with that of its partners. The DOI Climate Science Centers (CSC) and Landscape Conservation Cooperatives (LCC), established by Secretarial Order in February 2010, each have distinct science and resource-management roles but also share complementary capacities and capabilities. The CSCs, operated through the USGS, will provide scientific information, tools, and techniques that land, water, wildlife and cultural resource managers, and other interested parties can apply to anticipate, monitor, and adapt to climate and ecologically driven responses at regional-to-local scales. The LCCs are networks of public-private partnerships that provide shared science to inform integrated resource-management actions addressing climate change and other stressors within and across landscapes. Both of these initiatives will contribute strong, science-based support for DOI land managers to evaluate and plan for responsible, environmentally sound energy development in the context of overall landscape values.

The BLM is developing an ecoregional approach for managing public lands that builds upon and complements the DOI initiatives. The BLM's ecoregional approach builds interagency partnerships to identify important conservation and development priorities within an ecoregion.[2] The need for an ecoregional approach stems from a recognition that land managers and landowners throughout the West are facing complex management challenges that transcend traditional administrative jurisdictions. These challenges include expanding energy development, urban growth, wildfires, invasive species, extensive drought, melting permafrost, and other pervasive climate change-related impacts.

This ecoregional approach will provide a roadmap to help land managers understand these complex challenges and design and coordinate effective responses. The ecoregional approach has two main components: ecoregional assessment, which synthesizes existing science regarding resource conditions, trends, and management opportunities; and ecoregional direction, which identifies the BLM's key management priorities for the public lands within an ecoregion. The BLM's ecoregional priorities will be developed in partnership with other Federal and non-Federal land managers.

At a more specific scale, the BLM is analyzing in detail 24 solar energy study areas as part of the Solar Energy Development Programmatic Environmental Impact Statement, to determine whether these areas are appropriate for designation as Solar Energy Zones. Designated Solar Energy Zones would be those areas on the landscape identified as having the best potential and fewest resource conflicts for solar energy development. These zones would be well-suited to large-scale solar projects and set aside for that explicit purpose.

4.5.2 Best Management Practices

Best management practices (BMP) are state-of-the-art mitigation measures applied to energy exploration, development, and production to help ensure that development is conducted in an environmentally responsible manner. BMPs protect wildlife, air quality, water quantity and quality, viewsheds, night skies, soundscapes, special status areas, and landscapes as the Departments work to develop vitally needed domestic energy sources.

Some BMPs are as simple as choosing a paint color that helps equipment blend with the natural surroundings, while others involve cutting-edge monitoring and production technologies. All

[2] An ecoregion is a landscape that has similar resource characteristics, such as the Sonoran Desert, Northern Great Basin, or Colorado Plateau.

BMPs are based on the principle that the "footprint" of energy development should be as small and as light as possible and sited in the proper location using the proper technology given any environmental constraints. By reducing the area of disturbance, adjusting facility locations, and using numerous other techniques to minimize environmental effects, the BLM is significantly reducing impacts associated with new energy development to wildlife habitat, scenic quality, water quality, recreation opportunities, and other resources.

Numerous oil and gas operators have developed and used BMPs, and BMPs are being developed and tested in the renewable energy field. Through the use of BMPs, and as potential impacts and opportunities for mitigation are better understood, the DOI can encourage innovations in technology and practices. BMPs are not "one-size-fits-all" solutions but are tailored to the nature of the project and the resources and values of the project site. The actual practices and mitigation measures best suited for a particular site are evaluated through the NEPA process and vary to accommodate unique, site-specific conditions and local resource conditions.

The BLM Wind Energy Development Program established a number of policies and BMPs regarding the development of wind energy resources on BLM-administered public lands. The policies address the administration of wind energy development activities, and the BMPs identify required mitigation measures that would need to be incorporated into project-specific plans of development and rights-of-way authorization stipulations. Additional mitigation measures will be applied to individual projects, through stipulations in the rights-of-way authorization as appropriate, to address site-specific and species-specific issues. These policies and BMPs were formulated through preparation of the Final Wind Energy Programmatic Environmental Impact Statement (BLM 2005). Similar policies are in place for geothermal and transmission projects. Once complete, the solar PEIS will also establish BMPs and protection policies for solar energy development projects.

Energy production is a long-term, though typically not a permanent, use of public land. BMPs represent a commitment to the idea that smart planning and responsible followthrough reduce impacts to resources, both now and in the future. BMPs are a significant tool in the BLM's pursuit of enhancing environmental protection and the quality of life for all citizens through balanced stewardship of America's public lands and resources.

4.5.3 Addressing the Legacy of Historic Energy Development

In many areas, historic overuse of the land, often from the days prior to the introduction of environmental laws, has transformed some public landscapes into virtual wastelands of nonnative plant cover, neglected roads, abandoned energy and mineral infrastructure, and diverse streamside vegetation has been altered into barren monocultures such as salt cedar. These gradual changes have greatly damaged the land's biological productivity, resulting in less wildlife, degraded water quality, and decreased supplies of groundwater. Taking proactive measures to address these legacies of past misuse can aid in reducing the cumulative effects of energy development proposed on public landscapes. Historic oil and gas operations from the days when there were few or no regulations continue to disrupt wildlife habitats. Current operations have created cumulative impacts that may have contributed to wildlife population declines, such as mule deer in the Pinedale area of Wyoming. As the BLM learns more about cumulative impacts and implements monitoring and adaptive management programs, it is bet-

Illustration of BLM

Best Management Practices

In this example, the methods for reducing the visual contrast of the energy project are (1) painting the pump jack and other facilities on the pad a color that blends with the natural colors within the immediate surroundings, (2) siting the pad in amongst the trees to disrupt the form and lines of the facility, and (3) interim reclamation to reduce the visual contrast of the pumping unit and well pad.

Right: Several environmental best management practices have been successfully used in combination to minimize the footprint of energy development at this location. The area captured in the photo hosts six coalbed natural gas wells, 2 miles of two-track road, and 2 miles of pipelines and power lines buried beneath the road.

Bottom: Conventional energy development over time - Many areas contain important scenic values. Oil and gas development occur in some areas, but should always be considered a temporary use of the land. When oil and gas production has ended, facilities must be removed, the well must be plugged, the land recontoured back to its original land form, the site revegetated, and over time, the habitat and visual resources fully restored.

ter able to plan for future development reducing unintended impacts on air quality, wildlife, and other important resources.

4.5.4 Onsite and Offsite Mitigation

When an application to develop an energy project on public lands is received and the BLM begins to prepare an environmental analysis of the project, the BLM considers options to mitigate impacts to an acceptable level onsite (within the land area being proposed for development). Onsite mitigation is the norm and is achieved whenever possible through avoidance, minimization, remediation, or reduction of impacts over time.

Offsite mitigation consists of compensating for resource impacts by replacing or providing substitute resources or habitat at a different location than the project area. Offsite mitigation becomes an option only after application of onsite mitigation, including BMPs. The BLM continues to have an obligation to ensure that actions do not result in unnecessary or undue degradation to the public lands. An offsite mitigation option is a supplemental mitigation practice identified on a case-by-case basis and is based on the need to address important resource issues that cannot be acceptably mitigated onsite. Three types of offsite mitigation may be considered:

- **In-kind:** Replace or substitute resources that are of the same type and kind as those being impacted. This is generally the preferred option.

- **Out-of-kind:** Replace or substitute resources that, while related, are of equal or greater overall value.

- **In-lieu-fee:** Payment of funds to a natural resource management agency, foundation, or other appropriate organization for performance of mitigation that addresses project impacts.

The BLM determines when offsite mitigation may be needed through the NEPA review process. As impacts are identified during the environmental analysis, the BLM, the applicant, and cooperating agencies discuss mitigation options. Consideration of offsite mitigation may be appropriate when it is determined that a land use authorization cannot otherwise be brought into compliance with law, regulation, land use plan decisions, or other important resource objectives.

4.5.5 Facilitating FWS Endangered Species Permitting on Private Lands

Congressional Direction:

The conferees recommend that the Secretary evaluate whether a cooperative agreement with States under Section 6 of the Endangered Species Act, the establishment of a Section 4(d) rule under the same Act, or the creation of a template 'general habitat conservation plan' would improve the permitting process for solar projects on private lands in the California desert.

House Report 111-316, Renewable Energy and Public Lands

The DOI and California have established a renewable energy action team (REAT). The REAT agencies are addressing multiple challenges associated with renewable energy development in California, including expediting permitting on private lands. The REAT is working on tools to streamline approval of projects on private lands and provide protection of trust resources through

planning and oversight of the long-term development of renewable energy in California. These tools include:

- Conservation plan – Development of a large-scale desert conservation strategy, the Desert Renewable Energy Conservation Plan, to address project siting and impacts to listed species and native ecosystems on both public and private lands. This large-scale desert conservation strategy will meet the requirements of Section 10(a)(1)(B) of the Endangered Species Act and the California Natural Communities Conservation Planning Act, which is administered by the California Department of Fish and Game.

- In-lieu-fee program – The REAT agencies have established a mitigation account with the National Fish and Wildlife Foundation for all renewable energy and associated transmission projects in southern California. Mitigation funds deposited into the account will be used to mitigate impacts of these projects in a manner that would allow funds for land acquisition and funds for the restoration of existing Federal lands to be consolidated for the most effective long-term protection of biologically sustainable blocks of habitat to benefit desert dwelling wildlife species and habitats. An additional benefit is that the National Fish and Wildlife Foundation has the ability to leverage additional funds from third-party organizations that would likely increase the overall resources available for acquisition and management of conservation lands.

- 4(d) rule – The FWS is considering development of a draft Endangered Species Act 4(d) rule for the desert tortoise in order to facilitate timely permitting of low-impact projects on non-Federal lands.

- Best management practices – The REAT agencies have developed BMPs for wind, solar, and geothermal energy projects that will promote the siting of projects in areas on private lands by minimizing impacts to native habitats, state and federally listed species, and other species of concern.

4.6 Bonding and Reclamation

Congressional Direction:

The report should also include an analysis of the useful life of renewable energy sites and provide an explanation of how the infrastructure will be removed from the public lands when it is no longer functional. The conferees believes that some mechanism, such as a bond put forth by the permittees, should be utilized by the Department and the Forest Service so that the Government does not have to pay for the removal of these large facilities after they are no longer viable.

House Report 111-316, Renewable Energy and Public Lands

4.6.1 Overview

The BLM and USFS require financial bonds for all renewable energy development projects on Federal lands to ensure compliance with the terms and conditions of the rights-of-way authorization and applicable regulatory requirements, including reclamation costs. The amount of the required bond will be determined during the rights-of-way authorization process on the basis of site-specific and project-specific factors. The BLM and USFS may also require financial bonds for site monitoring and testing authorizations.

Both land agencies have the authority to require a bond for liabilities that the grantee or operator, for whatever reason, is unwilling or unable to address. The bond represents the final assurance that an obligation assumed by the grantee/operator will be fulfilled, even if the agency must step in and complete site reclamation itself.

The determination of what liabilities and obligations should be bonded depends, in part, on the types of environmental risks presented by the projects themselves. At a minimum, the bond will cover:

- "Hard" environmental liabilities (e.g., hazardous materials releases) for which the Federal Government may be ultimately liable;
- Decommissioning and deconstruction of facilities; and
- Reclamation, restoration, soil stabilization, and revegetation requirements for the project area.

4.6.2 Reclamation

Renewable energy facilities authorized on Federal lands, if properly maintained over time should last for a long period. The initial solar and wind authorizations will usually cover a 20- to 30-year period, but may be reauthorized for additional time if warranted. At whatever point a facility is no longer functional, full reclamation is required. If the proponent is incapable of completing the required reclamation, the Federal Government will exercise the reclamation bond in place to cover the full costs of reclamation.

4.6.3 Reclamation Standards

A decommissioning and site reclamation plan, requiring approval by the BLM and USFS prior to the start of construction, will define the reclamation, revegetation, restoration, and soil stabilization requirements for the project area. This plan includes the reclamation of construction areas and the revegetation of disturbed areas as quickly as possible to reduce invasive weed infestation and erosion. The approved decommissioning and site reclamation plan will be used as the basis for determining the standard for reclamation and restoration of the project area and, ultimately, in determining the bond amount.

5.0 Conventional Energy Development

Broaden the Department's review to include an analysis of all energy development on public lands not just renewable energy, including siting processes, permitting costs, related staffing, long-term reclamation and remediation costs, multi-agency coordination activities, as well as the methodology used by the Department to limit the short- and long-term impacts on land, water, air quality, wildlife, public health and scenic values associated with non-renewable energy resource extraction, production, and, where applicable, related waste storage.

Recommendations from Senate Majority Leader Harry Reid to the Secretary of the Interior Ken Salazar, December 21, 2009

5.1 Oil and Gas in the Federal Estate

The Administration continues to emphasize responsible development of important oil and gas resources on the public lands. In the last 2 years, oil production from the Federal OCS has increased by more than a third, from 446 million barrels in 2008 to an estimate of about 600 million barrels in 2010. Oil production from Federal waters in the Gulf of Mexico reached an all-time high in 2010. The region accounts for most OCS production, and 30 percent of total U.S. oil production.

In the past 2 years, oil imports have fallen by 9 percent. Net imports as a share of total consumption have declined from 57 percent in 2008 to less than 50 percent in 2010.

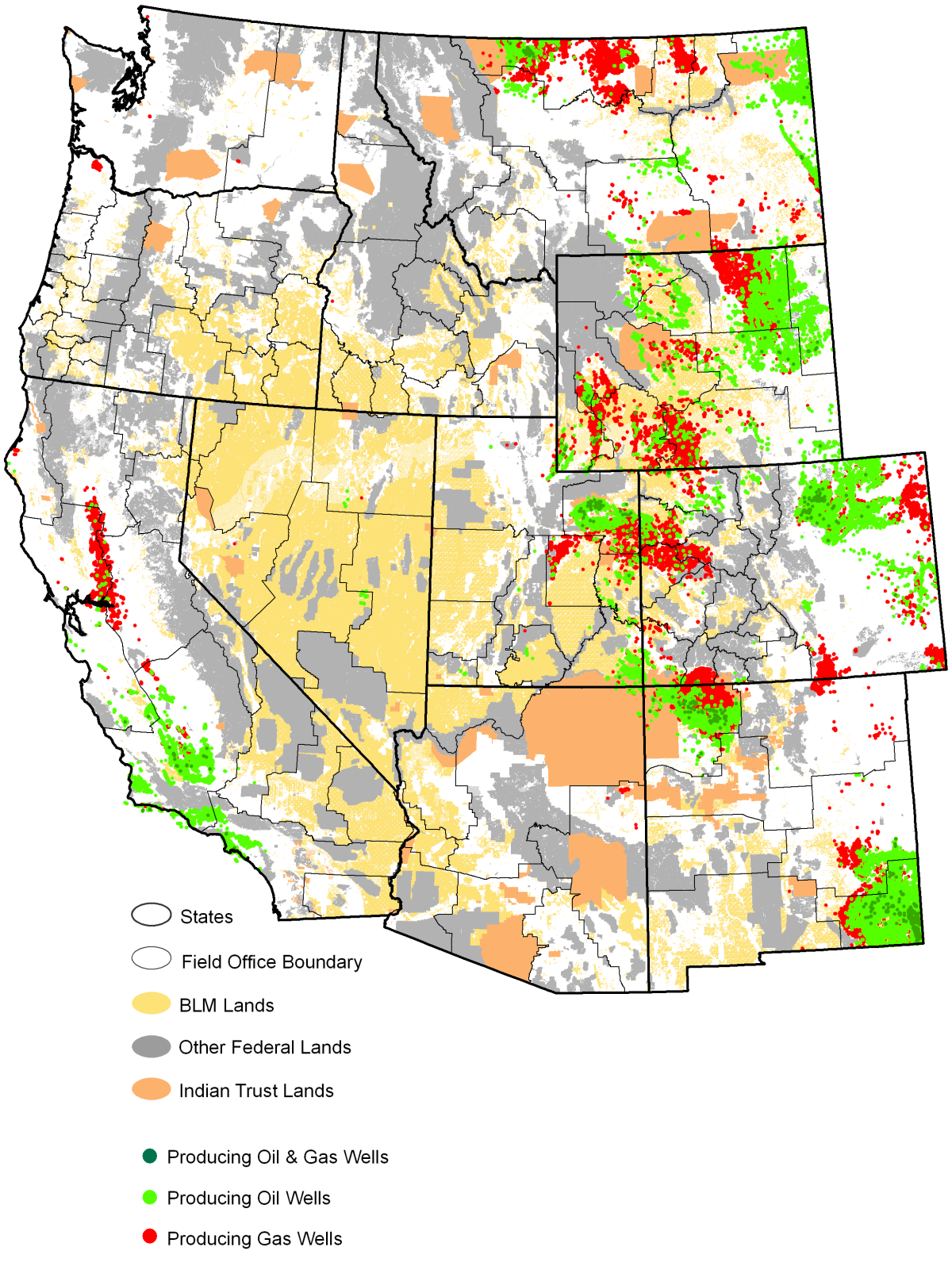
The U.S. natural gas production is also increasing, reaching 26.9 trillion cubic feet in 2010, a 5 percent increase from 2008 and the highest level in more than 30 years.

The Obama Administration has also offered, and continues to offer, millions of acres of public land and Federal waters for oil and gas exploration and production. In 2010, the BLM held 33 oil and gas lease sales covering 3.2 million acres. In 2011, the BLM is scheduled to hold an additional 33 lease sales. Currently, just 55 percent of all leases (43 percent of acres) have some activity (production or exploration); 38.2 million acres of public lands are currently under lease for oil and gas development, of which only 16.6 million acres are active and 21.6 million acres are inactive. Given that a large percentage—perhaps half of the BLM's more than 248 million acres—of public lands is in states, such as Nevada, Idaho, interior and southwest Alaska, and eastern Oregon, where oil and gas development is unlikely due to geological and/or logistical issues, it is clear that the BLM has provided ample opportunities for industry leasing and development, and continues to do so.

Onshore
Oil and Gas

- Onshore Federal oil production – 6 percent of total domestic production
- Onshore Federal gas production – 15 percent of total domestic production
- Onshore Federal lands nationwide are estimated to contain 31 billion barrels of technically recoverable oil.
- In the conterminous U.S., there is an estimated 700 trillion cubic feet (TCF) of coalbed natural gas, with about 100 TCF economically recoverable with existing technology.

Producing Oil and Gas Wells



Permitting of oil and gas development onshore also continues apace. In 2010, the BLM processed more than 5,200 APDs on Federal and Indian lands. In 2011, the BLM expects to process more than 7,200 APDs. The BLM has also begun clearing out large backlogs of protested leasing and permitting actions that built up in the mid-2000s.

Offshore, in 2010, the BOEMRE offered 36.9 million offshore acres in the Gulf of Mexico for oil and gas exploration and production; 37.9 million acres of the OCS are under active lease, of which 6.5 million acres are producing. More than 70 percent of offshore leases are not producing.

The Obama Administration has undertaken needed reforms to make oil and gas development safer and more environmentally responsible both onshore and offshore. The DOI raised the bar for safety and environmental responsibility, setting standards and certification protocols for well design, testing, and control equipment and establishing rigorous performance standards to reduce workplace error and require comprehensive safety and environmental management. Operators must now submit well-specific blowout scenarios and revised worst-case discharge calculations. Deepwater operators must also show that they have the capability to contain a subsea discharge like the Deepwater Horizon oil spill. These standards set a clear, achievable path for responsible offshore exploration, development, and production.

Even while strengthening safety standards, the Administration has continued to facilitate new offshore oil and gas development. Since the Deepwater Horizon oil spill, BOEMRE has approved 38 shallow water permits in the Gulf of Mexico. BOEMRE also recently issued its first five deepwater permits for new wells with stricter safety standards, including the requirement that operators demonstrate the ability to contain a deepwater blowout. BOEMRE has also issued 26 permits for deepwater activities that were not subject to the deepwater drilling suspensions.[3]

5.1.1 Onshore Overview

The BLM manages nearly 700 million acres of onshore subsurface mineral estate. The BLM seeks to achieve balance in its management of the many resource uses and values found on the Nation's public lands. The leasing and development of conventional oil and gas resources, like all resource uses, can and does have short- and long-term environmental and social impacts. Impacts result from the exploration, drilling, production, and transportation necessary to find, produce, and move oil and gas to market. Potential impacts associated with conventional energy development are specific to each site, but may include impacts to wildlife habitat, scenic resources, surface or groundwater quality, air quality, recreation, tribal and cultural resources, or rural life and communities. Proper lease stipulations; project siting, design, construction, and reclamation; and state-of-the-art mitigation measures (best management practices) applied to the approved permit can substantially reduce environmental and social impacts. However, effective inspection and enforcement strategies as well as monitoring programs are also necessary to ensure project mitigation measures are both implemented and effective.

Wildlife

The public lands serve as habitat for many important, sensitive, or threatened and endangered wildlife species. Oil and gas development can result

[3] These data are current as of March 23, 2011.

in the loss of vegetation that serves as habitat for wildlife. Linear disturbances, such as oil and gas roads, pipelines, and power lines, can also lead to the fragmentation of habitat into areas too small to be effectively used by certain species. Oil and gas truck traffic and its associated noise and intrusion can also decrease habitat suitability. Unless properly mitigated, oil and gas development and its associated infrastructure and traffic can lead to local decreases in wildlife populations.

Scenic Resources

Many of the lands under the BLM's management contain scenic landscapes. Development of oil and gas resources typically includes well locations, production facilities, utility rights-of-way, and access roads that may dominate the character of the landscape unless properly mitigated to reduce visual contrast.

Surface and Groundwater Quality and Quantity

The public lands contain important sources of surface and groundwater. The drilling, completion, and production of oil and gas wells may result in impacts to surface and groundwater quality unless properly mitigated. Surface water runoff can lead to sedimentation of waterways unless properly controlled through stormwater management practices. Depending on the type of well being drilled, the use of large quantities of water may be necessary during the construction, drilling, and completion of a well and the hydraulic fracturing of the oil or gas producing zone. This water may come from surface water bodies, underground sources, or municipal sources where it may be in short supply. Oil and gas reservoirs are typically located thousands of feet below the surface. Formations (or zones) containing freshwater are isolated through the use of well casing and cementing during the drilling process to prevent contamination of freshwater supplies with drilling and completion fluids. Rarely, a casing or cementing failure may result in contamination of freshwater supplies.

During the production phase of a well, water within the oil or gas formation may be produced out of the well and must be either treated and reused or disposed of in accordance with state or Federal laws and regulations. Disposal typically occurs through surface infiltration and evaporation impoundments, underground injection into formations not suitable for drinking water, or treating the water and discharging it into waterways. All methods require prior approval from the BLM and other regulatory agencies, such as the state or Federal EPA.

Development of oil and gas may require significant amounts of water relative to available resources, and with some development, such as coal bed methane production, aquifers over many square miles can be dewatered. In permitting new development, the impacts of these demands will be considered, and actions that promote sustainable water strategies will be identified.

Air Quality

Unless properly reduced through devices to control or recapture emissions, conventional oil and gas development can result in emissions of particulates, hazardous air pollutants, volatile organic compounds (VOCs), and greenhouse gases. Typical sources of these emissions include (1) drilling rig engines, (2) well completion operations, (3) emissions and dust from truck traffic, (4) heavy equipment used to construct roads, well pads, and pipelines, (5) fugitive VOCs escaping from storage tanks at production facilities, (6) fugitive methane emissions from pneumatic devices on oil and/or gas treatment equipment, and (7) wells flared during completion and pro-

duction operations. These emissions are either regulated as pollutants under the Clean Air Act or serve as precursors to pollutants regulated under the Clean Air Act.

Recreation

The public lands contain unique opportunities for outdoor recreation. Hunting, fishing, sightseeing, and other recreation activities can be affected by the increased infrastructure and traffic associated with oil and gas development. Oil and gas development may directly displace wildlife from areas of concentrated development or may detract from the recreation experience unless properly mitigated to reduce the presence of development.

Cultural Resources

The public lands contain many unique cultural and tribal resources. While the BLM takes steps to ensure consultation with tribes and surveys for cultural resources, inadvertent impacts to tribal or cultural resources can occur.

Rural Life and Communities

The public lands provide open space and rural landscapes for public enjoyment. Oil and gas development can lead to the short- or long-term development of these landscapes. Local employment and property values may increase during development. However, this new economic activity can also lead to decreased property values of homes adjacent to oil and gas development; social impacts associated with the influx of a large temporary workforce; and boom and bust economies if not properly managed.

Managing Impacts

The BLM's objective is to ensure that natural resources and uses of public lands and adjoining lands are given comprehensive consideration, mitigation, and protection, while at the same time providing industry the opportunity to produce, in appropriate places, the energy needed to serve the Nation in a manner sensitive to environmental concerns.

The BLM's Resource Management Plan is the first step in ensuring environmentally responsible oil and gas development. With extensive public input, the Resource Management Plan identifies areas open or closed to oil and gas leasing and development. Where lands are available for leasing and potential resource conflicts have been identified, the BLM identifies lease stipulations for the protection of important resource values, such as air, water, or wildlife habitat.

Under its new leasing reform policy, the BLM conducts a more site-specific review of parcels nominated for leasing to determine whether the allocation decisions and lease stipulations contained within the Resource Management Plan are still valid in light of changing circumstances and new information or science. The BLM then leases individual parcels with either standard terms and conditions or special lease stipulations, or the BLM may defer leasing a parcel pending additional land use planning.

After a lease has been issued, oil and gas operators proposing to drill their lease must first submit a detailed permit application outlining their plans. The APD must address the operator's plans for drilling and producing the well, including construction of any associated well pads, production facilities, roads, pipelines, and power lines. The BLM conducts an additional environmental review to analyze the operator's site-specific drilling and development proposal. During that review, the BLM typically analyzes alternatives to the operator's proposal and applies additional mitigation measures necessary for reducing the

Protecting Air Quality

The extensive oil and natural gas resources of the Uinta Basin in northeastern Utah have enormous potential for domestic energy production and for associated expansion of economic and employment opportunities in the area.

Recently, however, the challenge of developing these energy resources without compromising environmental quality has been made far more complex with the finding that energy development activities are associated with highly elevated concentrations of ozone. Recent ozone readings, according to the EPA, are among the highest ever recorded in the United States.

To address this challenge and other air quality issues associated with energy development on public lands, the BLM is working closely with the State of Utah, EPA Region 8, and other stakeholders to create and implement a comprehensive, collaborative air quality management strategy.

EPA Region 8 has agreed with the plan outlined in the strategy, and the BLM is seeking additional support for the strategy from other stakeholders, including the USFS, the Ute Indian Tribe, industry, and conservationists.

The BLM continues to support a variety of research efforts that can contribute to an effective air quality strategy for the Uinta Basin as well as other areas of high-density energy development activity. Among these are research partnerships with Utah State University's Energy Dynamics Laboratory and the Utah Department of Environmental Quality.

environmental and social impacts of development.

New technology and creative application of new approaches to drilling and production have demonstrated that, with proper siting techniques and environmental mitigation practices, the impact from development of our Federal oil and gas resources can be substantially reduced. The BLM is working with industry to make these best management practices a business standard. For example, the increased of the use of horizontal drilling techniques has led to areas where operators drill multiple wells from a single development pad. This reduces the need for multiple pads, roads, and pipelines. Centralizing production facilities has reduced oil field traffic, helping to minimize dust and exhaust with a net improvement in air quality and reduced impacts to wildlife.

5.1.2 Leasing Reforms

Decisions at the land use planning stage are the first step in determining whether an area is appropriate for the siting of oil and gas activities on public lands. At this stage, the appropriateness of offering lands for lease should be assessed.

In January 2010, Secretary Salazar called upon the BLM to implement a number of leasing reforms while maintaining its program to make areas available for oil and gas development. These reforms are intended to reduce potential conflicts that can lead to costly and time-consuming protests and litigation of leases by improving the bureau's process for reviewing potential impact to air, land, viewsheds, water, and wildlife.

Four months later, the BLM finalized the leasing reforms requested by the Secretary. Many of these measures follow the recommendations of an interdisciplinary review team that studied a controversial 2008 oil and gas lease sale in Utah.

Under the oil and gas leasing policy reforms, the BLM will:

- Ensure potential lease sales are fully coordinated both internally and externally, including public participation, and interdisciplinary review of available information, as well as onsite visits to parcels prior to leasing when necessary to supplement or validate existing data.

- Engage the public in the development of master leasing plans prior to leasing in certain areas where significant new oil and gas development is anticipated. The intent is to fully consider other important natural resource values before making a decision on leasing and development in an area and to ensure orderly development in a way that does not create unanticipated impacts (such as air quality pollutant exceedances and wildlife population declines).

- Implement an "extraordinary circumstances" review screen before applying the categorical exclusions in the Energy Policy Act of 2005 to oil and gas drilling activities on BLM lands. Categorical exclusions are categories of actions that do not have a significant effect on the quality of the human environment and for which the BLM is generally not required to prepare extensive environmental reviews. A review for extraordinary circumstances has been required for all administratively established categorical exclusions and will now apply to oil and gas categorical exclusions established by the Energy Policy Act of 2005.

5.1.3 Pilot Project to Improve Federal Permit Coordination

The BLM and USFS have completed implementation of Section 365 of the Energy Policy Act, the pilot project to improve Federal permit coordination. During the pilot's first few years, the program achieved two key objectives:

- The program has improved reliability in providing industry the permits needed to develop new energy resources for the Nation.

- The pilot offices have made significant progress on improving environmental stewardship and mitigating resource impacts resulting from energy development.

Section 365 established a pilot project with the intent to improve the efficiency of processing oil and gas use authorizations and environmental stewardship on Federal lands. The project established pilot offices in seven BLM field offices: Miles City, Montana; Buffalo and Rawlins, Wyoming; Vernal, Utah; Glenwood Springs, Colorado; and Farmington and Carlsbad, New Mexico. This program focuses on enhancing interagency collaboration and environmental stewardship through the collocation of agency staff and has already resulted in significant communication and process improvements.

The BLM formed a partnership among several Federal agencies including the USFS, FWS, U.S. Army Corps of Engineers, BIA, EPA, and a variety of state agencies, including state fish and wildlife departments, environmental quality departments, state oil and gas divisions, and state historic preservation offices. As part of this partnership, the BLM is reimbursing these collaborating agencies for their costs in supporting the pilot offices. Additional resources and oversight, particularly the expertise of geologists or petroleum engineers, natural resource specialists, archeologists, and wildlife biologists, have been to these offices.

While permit processing times have decreased, there has been a substantial increase in the num-

ber of well inspections. This enhanced field inspection presence has led to earlier detection of compliance problems before they result in major violations. Pilot collocation of agency staff has also improved communication and led to process improvements by allowing for participation of agency personnel on interdisciplinary teams and decisionmaking.

In the meantime, the BLM has worked aggressively to eliminate backlogs in the processing of APDs and in the issuance of parcels that have been sold but not issued.

5.1.4 Oil and Gas Best Management Practices

The BLM and USFS oil and gas programs—in partnership with industry, conservation interests, and others—work diligently to identify the BMPs that can reduce or mitigate the environmental impacts of energy development activities. The BLM also initiated a director's program evaluation of the agency's implementation of environmental BMPs. The evaluation emphasized the need to ensure appropriate environmental BMPs are incorporated into all oil, gas, geothermal, and associated rights-of-way permit approvals.

5.1.5 Bonding

The BLM requires bonds to ensure that operators are able to financially support necessary and required efforts to meet lease and permitting obligations. The BLM's oil and gas program uses a "performance" bonding system. By regulation, operators seeking approval of an APD, who within the previous 5 years have caused the BLM to demand a bond or financial guarantee upon the operator's failure to plug and reclaim, are required to post a bond equal to the full cost of reclaiming the site. Further, bond holders who default and fail to reimburse the bureau for the full cost of site reclamation may subject all of their leases under the bond to cancellation. Pursuant to a recent Government Accountability Office recommendation, the BLM is evaluating its bonding procedures to assess appropriate minimum bonding levels and will increase minimum amounts through a rulemaking process.

Process Improvements for Oil and Gas on National Forest Lands

Since the revision of Onshore Oil and Gas Order No. 1, which provided for submittal of master development plans, the USFS has seen an increase in oil and gas operators using that process.

In doing so, the operators propose multiple wells in their original plan submittal rather than submitting applications one well at a time. This facilitates a more efficient and comprehensive analysis of the potential environmental affects and the identification of reasonable mitigation prior to reaching an impact threshold.

This is also becoming an effective management tool as new technology is introduced in the oil and gas development process. New drilling technology and equipment, given the right geologic setting, enables multiple wells to be drilled from a single location, thereby reducing the environmental footprint of development activities.

5.2 Coal Program

5.2.1 Overview

Public lands are available for coal leasing only after the lands are evaluated through the BLM and USFS multiple-use planning processes. Leasing Federal coal resources is prohibited in units of the NPS, national wildlife refuges, other conservation system units, and certain military reservations. In areas where development of coal resources may conflict with the protection and management of other resources or public land uses, the BLM or USFS may choose not to lease or will identify mitigating measures to be included in leases as either stipulations to uses or restrictions on operations.

The decision to lease Federal coal is made by the BLM after a competitive process requiring the government, at a minimum, to receive fair market value for the coal. Prior to mining a new Federal coal lease area, the leases must be permitted. The Surface Mining Control and Reclamation Act of 1977 (SMCRA) gives the OSM the authority to administer programs that regulate surface coal mining operations. New or revised mining permits issued by the OSM must include mitigation requirements identified through the leasing process, but additional conditions or stipulations may also be required by the permit. The BLM's role after leasing is to ensure the maximum economic recovery of the leased Federal coal and compliance with coal lease stipulations. The OSM or the delegated state agency is responsible for permit administration including oversight of the reclamation plan.

Impacts from Coal Production

Environmental impacts are inherent to both surface and underground coal production. Those impacts are accompanied by economic development in the location of the mine and, if the coal is federally owned, an income stream to both Federal and state entities.

Elements of the environment that can be affected by coal mining include air quality, cultural resources, Native American religious concerns, threatened and endangered species, migratory birds, hazardous or solid wastes, water quality, wetland/riparian zones, flood plains, invasive nonnative species, and environmental justice. Depending on the lands associated with the proposed mine, prime farmlands, wild and scenic rivers, and wilderness areas also can be of concern. Coal production may also impact topography, geology, mineral resources, soils, alluvial valley floors, vegetation, wildlife, land use, recreation, paleontological resources, visual resources, noise, transportation resources, climate change, and socioeconomics. Impacts to these elements are identified and mitigation measures are outlined in environmental impact statements, environmental assessments, and resource management plans of the BLM when Federal coal and/or Federal lands are present.

Surface mining of coal resources can disturb coal aquifers in the overburden above the coal. The coal aquifer and any water bearing strata in the overburden may be removed and replaced with relatively homogeneous, unconsolidated backfill. In the Powder River Basin, it is estimated that the re-saturation of coal mine pit backfill to form backfill aquifers may take approximately 100 years after cessation of mining. Groundwater in backfill aquifers following mining activities often exhibits an increase in total dissolved solids concentrations; however, over time groundwater quality in these backfill aquifers are predicted to return to near pre-mine conditions. Runoff events may carry additional sediment loads from disturbed sites that could impact surface water quality.

Surface mining activities lead to the progressive removal of native vegetation resulting in increased erosion and loss of wildlife and livestock habitat. During mining, wildlife can be displaced and habitat lost in active mining areas. Wildlife movement through mining areas may be restricted, and shifts in habitat utilization can occur during the life of the operations.

Restoration

Restoration of the environment is required pursuant to SMCRA under the OSM. Since SMCRA was enacted in 1977, the science of restoration of disturbed lands has matured, and lands disturbed by coal mining are being returned to their original use. Mined areas are reclaimed as specified in the reclamation plan portion of the mine permit approved and administered by OSM. The reclamation plan describes post mining land uses, the contouring plan for affected land, how topsoil and/or subsoil will be stockpiled and redistributed, re-vegetation practices, including steps to control invasive plant species and final hydrologic restoration of the mined area. The reclamation plan also includes a reclamation schedule and associated costs and methods of evaluating reclamation success.

The SMCRA requires contemporaneous reclamation of the land to its pre-mining land use, thus minimizing the amount of disturbed land during mining. Completed reclamation upon completion of mining is also required. Upon successful mine restoration, the final reclamation bond is released, generally a minimum of 10 years following seeding with the final seed mixture.

5.2.2 Lands Suitable for Coal Leasing

Not all public lands are available for coal exploration or leasing. There is a rigorous land use planning process through which all public lands are reviewed for potential coal leasing. Requirements for the land use plan include multiple use, sustained yield, protection of critical environmental areas, application of specific unsuitability criteria, and coordination with other Government agencies. There are four specific land use screening steps that are unique to developing land use planning decisions for Federal lands with coal resources. These are:

- Identification of coal with potential for development;
- Determination if the lands are unsuitable for coal development;
- Consideration of multiple-use conflicts; and
- Surface owner consultation.

The purpose of the coal screening part of the land use planning process (43 CFR 3420.1-4) is to identify those Federal lands that are acceptable for further consideration for coal leasing and development.

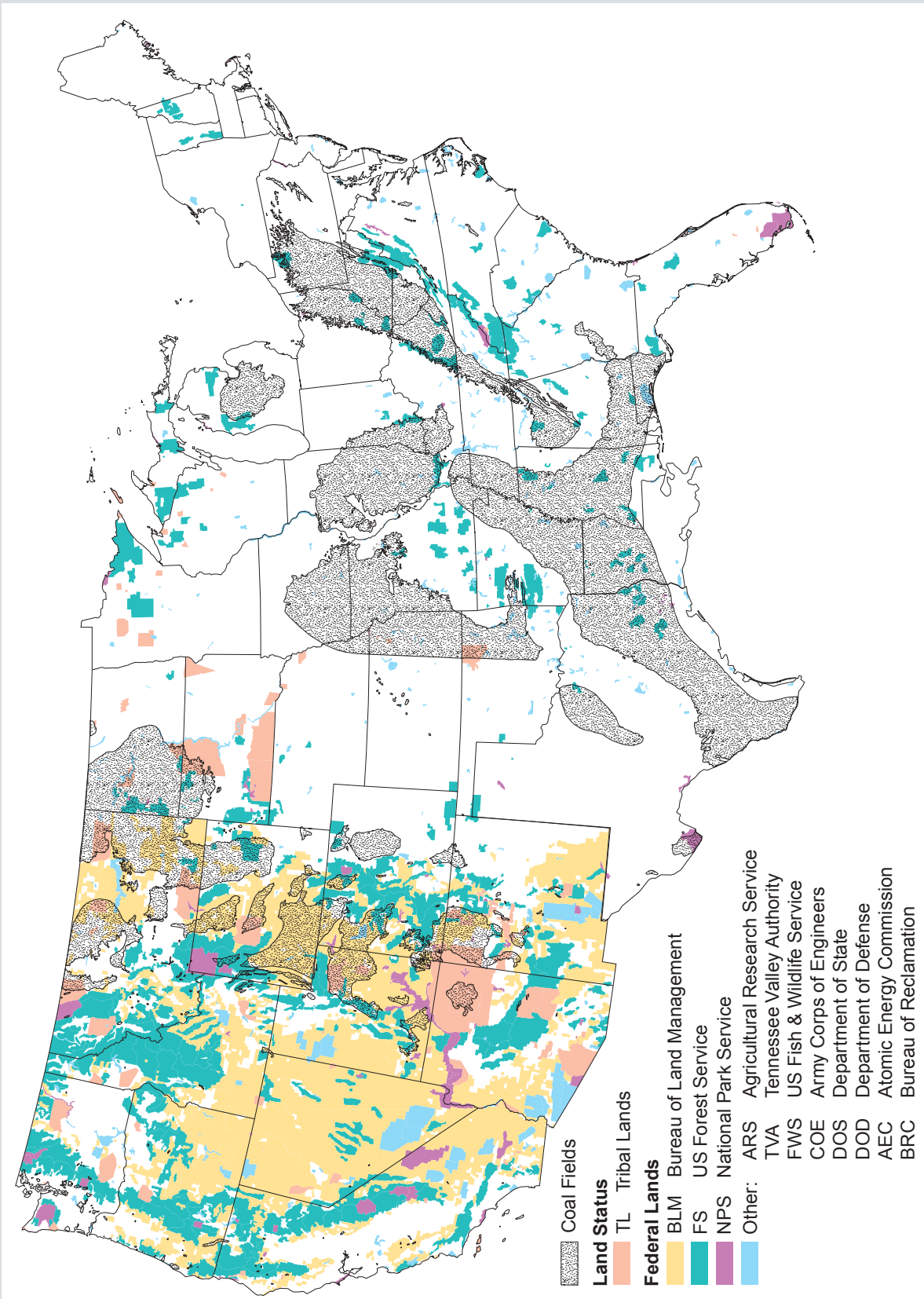
5.2.3 Competitive Leasing Process

There are two distinct procedures for competitive coal leasing: (1) regional leasing where tracts are selected within a region for competitive sale and (2) leasing by application where the public nominates a particular tract of coal for competitive sale. Regional coal leasing requires the selection of potential coal leasing tracts based on multiple land use planning, expected coal demand, and potential environmental and economic impacts. This process requires close consultation with local governments and citizens through a Federal/state advisory board known as a regional coal team. However, because demand for new coal leasing in recent years has been associated with the extension of existing mining operations on

Coal

- Roughly half of the Nation's electricity is derived from coal.
- Forty-two percent of the Nation's coal is produced from Federal leases.
- The BLM administers 300 coal leases.
- FY 2000-2010
  - 4.53 billion tons of coal mined from BLM-managed lands
  - 43 lease sales
  - Coal generated $7.9 billion from bonuses, royalty, and rent payments

Coal Fields and Federal Lands of the Conterminous United States



authorized Federal coal leases, all current leasing is done by application.

Leasing by application begins with BLM and USFS review of an application to lease a coal tract to ensure that it conforms to existing land use plans and contains sufficient geologic data to determine the "fair market value" of the coal. Upon review of the application and consideration of public comments, the BLM will reject, modify, or continue to process the application.

Once an application is accepted, the agency begins either an environmental analysis or EIS. When an environmental analysis or a draft version of an EIS has been prepared, the BLM seeks public comment on the proposed lease sale. At the same time, the BLM will also consult with other appropriate Federal, state, and tribal government agencies.

5.2.4 Lease Terms and Conditions

A Federal coal lease grants the right to explore for, extract, remove, and dispose of some or all of the coal deposits that may be found on the leased lands. Coal leases are granted on the condition that the lessee will obtain the appropriate permits and licenses from the BLM, OSM, and any affected state and local governments. For competitively issued leases, companies may pay bonus bids in five equal annual installments.

5.2.5 Bonding

Before the BLM issues a coal lease, the lessee must furnish a bond in an amount determined by the BLM and USFS to ensure compliance with the terms and conditions of the lease. At a minimum, a bond is required that will cover one-fifth of the bonus bid if there is any remaining unpaid balance, as well as 1 year of advance rental and ¼ year of estimated royalties, if the lease is in production. In addition, the SMCRA requires sufficient bonding to cover anticipated reclamation costs. This bond is submitted to the OSM or the state regulatory office. The BLM may require a change in bond amount, either an increase or decrease, at any time the agency believes it is warranted.

5.2.6 Termination of a Lease

A Federal coal lease has an initial term of 20 years, but it may be terminated in as few as 10 years if the coal resources are not diligently developed. A Federal coal lease can also terminate if a lessee fails to pay any of the deferred bonus bid payments. In addition, if the lessee fails to comply with the provisions of the Mineral Leasing Act of 1920, as amended, or fails to comply with any applicable regulations, lease terms, or stipulations, the BLM may issue a decision to cancel the lease.

A lessee may, at any time, seek to surrender a lease in whole or in part by filing a written request for relinquishment with the jurisdictional BLM office. However, the lessee must be in compliance with all lease terms and conditions and have paid all payments and fees. The lease bond is in place to ensure compliance with the terms and conditions of the lease.

5.3 Offshore Oil and Gas Development

"Our ultimate goal is to promote a culture of safety within industry and to serve as aggressive but reasonable regulators who have the tools and expertise necessary to do the job."

BOEMRE Director Michael Bromwich

5.3.1 Overview

The BOEMRE manages the Nation's oil, natural gas, and other energy and mineral resources on the 1.7 billion acres of the OCS. Within BOEMRE, the Offshore Energy and Minerals Management program regulates OCS activities, including administering OCS leases, monitoring the safety of offshore facilities, and protecting our coastal and marine environments. The OCS is believed to contain more than 60 percent of the Nation's remaining undiscovered technically recoverable oil and almost 40 percent of its undiscovered technically recoverable natural gas (MMS National Assessment, 2006).

Oil and gas exploration, development, transportation, and decommissioning activities and associated accidental events can lead to impacts on environmental resources, such as:

- Oil spills;
- Air emissions from drilling, transportation, oil spills, and other sources;
- Discharges of produced water, wastes, and drilling materials;
- Bottom disturbances from platform and pipeline emplacements and from anchors; and
- Noise effects from seismic, operational, and decommissioning activities.

The OCS Lands Act requires the Secretary of the Interior to balance the potential for oil and gas discoveries against the potential for environmental or other harms from the continued development of our domestic energy resources on the OCS. In light of the April 20, 2010, Deepwater Horizon explosion and subsequent oil spill in the Gulf of Mexico, this balancing takes on new meaning. All future offshore oil and gas activities must be guided by strict adherence to the rule of law, the best available science, robust environmental protections, and effective oil spill prevention.

The Deepwater Horizon spill triggered an extensive review of all aspects of the OCS oil and gas program:

- Secretary Salazar presented a safety report to the President with more than 30 recommendations (many of which have already been implemented).
- A joint investigation into the root and contributing causes of the event is being conducted by BOEMRE and the U.S. Coast Guard.
- President Obama formed a National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling to examine the disaster and make recommendations for the future of offshore drilling.

All aspects of OCS activities are being investigated and evaluated and will be revised as necessary. Significant changes are being made, and further changes can be anticipated in the near

future. Due to the dynamic nature of this process and ongoing investigations, this report does not address the specific details regarding OCS safety management systems, inspections, and related activities. Rather, it describes the general BOEMRE processes for OCS leasing, permitting, monitoring, and reclamation, including points of coordination with other agencies.

On October 14, 2010, BOEMRE published an interim final rule that implements certain safety measures recommended in the report to the President entitled, Increased Safety Measures for Energy Development on the OCS. This rule became effective immediately upon publication and amends drilling regulations related to well control, including: subsea and surface blowout preventers, well casing and cementing, secondary intervention, unplanned disconnects, recordkeeping, well completion, and well plugging.

The BOEMRE issued a final Safety and Environmental Management Systems rule that became effective on November 15, 2010. This rule requires operators to develop a comprehensive safety and environmental management program that identifies the potential hazards and risk-reduction strategies for all phases of activity, from well design and construction, to operation and maintenance, and finally to the decommissioning of platforms.

The BOEMRE has also issued important guidance, in the form of Notices to Lessees (NTLs), which provides operators additional direction with respect to compliance with the bureau's existing regulations. Under NTL-N06, operators are expected to submit well-specific blowout scenarios and worst case discharge calculations, as well as provide the assumptions and calculations behind these scenarios. NTL-N10 establishes informational expectations related to regulatory compliance and subsea containment, demonstrating access to, and the ability to deploy, subsea containment resources sufficient to promptly respond to a deepwater blowout or other loss of well control.

On January 8, 2011, Secretary Salazar established an advisory body through which the Nation's leading scientific, engineering, and technical experts will provide input on improving offshore drilling safety, well containment, and spill response. The Ocean Energy Safety Advisory Committee will also facilitate collaborative research and development, training and execution in these and other areas relating to offshore energy safety. The committee has 15 members representing Federal agencies, industry, academia, national labs, and various research organizations.

The principles and requirements of the OCS Lands Act remain the core statutory direction for BOEMRE's offshore oil and gas leasing program.

The OCS Lands Act

In order to balance the priorities of national energy needs, environmental protection, and receipt of fair market value, the OCS Lands Act requires: the Secretary to consider information on the geographical, geological, and ecological characteristics of each region; equitable sharing of development benefits and environmental risks; regional and national energy markets; other uses of the OCS; interest of potential oil and gas producers; the laws, goals, and policies of the affected states; the relative environmental sensitivity and marine productivity of different areas of the OCS; and the relevant environmental and predictive information for different areas of the OCS.

The 5-Year OCS Oil and Gas Leasing Program initiates the process of deciding how, when, and where it is appropriate to offer oil and gas leases on the OCS. As the leasing process moves for-

ward, the potential areas to be offered for lease cannot be expanded from those available in the previous step without re-initiating the development of a new 5-year program. Thus, the entire leasing process proceeds from broad-based planning to a more narrow focus as actual development is proposed.

After a new 5-year program is finalized, there is further environmental review and consultation with other Federal agencies and state, local, and tribal governments before holding any individual lease sale. As with the development of a new 5-year program, the individual sale process is conducted in an open, transparent, predictable manner. From the call for information/nominations to the final notice of sale, the individual lease sale process, described in Section 19 of the OCS Lands Act, includes many opportunities for public input, in addition to the opportunities offered by necessary procedures under NEPA and the Coastal Zone Management Act. In all, there are eight opportunities for public comment before a final decision is made to hold any OCS sale.

OCS 5-Year Programs (What Happens Next):

On December 1, 2010, Secretary Salazar announced an updated oil and gas leasing strategy for the OCS. Based on lessons learned from the Deepwater Horizon oil spill, the DOI has raised the bar in the drilling and production stages for equipment, safety, environmental safeguards, and oversight. In order to focus on implementing these reforms efficiently and effectively, critical agency resources will be focused on planning areas that currently have leases for potential future development. As a result, the area in the Eastern Gulf of Mexico that remains under a congressional moratorium, and the Mid and South Atlantic planning areas are no longer under consideration for potential development through 2017. The Western Gulf of Mexico, Central Gulf of Mexico, a small portion of the Eastern Gulf of Mexico, Cook Inlet offshore Alaska, and Chukchi and Beaufort Seas in the Arctic will continue to be considered for potential leasing before 2017.

On December 23, 2010, Secretary Salazar issued the Revised Program Outer Continental Shelf Oil and Gas Leasing Program for 2007-2012. To inform the Secretary's decision on the program, the BOEMRE re-analyzed all 26 OCS planning areas to better determine the relative environmental sensitivity of several ecological components to multiple impacts of offshore oil and gas development. The expanded analysis not only continued to analyze the sensitivity of shoreline/coastal habitats, but also went further to analyze sensitivity of offshore/marine resources to oil and gas activities. This analysis relied on nearly 50 reports and studies, many of which were not considered when the original 2007-2012 relative environmental sensitivity analysis was prepared.

The BOEMRE identified three relevant components of the various areas of the OCS (the biological marine environment) that may be affected by oil and gas activities: marine habitats, marine productivity, and marine fauna (e.g., birds, fish, marine mammals, and sea turtles). The analysis considers the relative sensitivity of the marine environment in all planning areas to multiple impact-producing factors, such as oil spills, sound, and physical disturbance and increased sensitivity due to climate change and ocean acidification.

Seismic surveys, drilling and production activities at OCS facilities, and support vessel traffic generate sound that could affect marine resources. The BOEMRE requires monitoring and mitigation measures to minimize impacts from sound on marine resources. For example, independently contracted protected species observers monitor exclusion zones around the source vessels and

shut down procedures when protected species are within the exclusion zone.

Physical disturbance includes bottom disturbances from OCS platform and pipeline emplacements, as well as from anchors. The BOEMRE requires site-specific surveys to assist in avoiding direct contact with marine habitats and archeological sites. However, unavoidable or accidental disturbances could result in physical destruction and burial of organisms and habitat.

As a result of environmental review and consultations in the pre-lease sale process, additional areas may be excluded from leasing, and mitigating measures may be required to address any potential impacts from oil and gas exploration and development. For example, BOEMRE has required protections for the Flower Garden Banks National Marine Sanctuary in the northwest Gulf of Mexico by prohibiting leasing in the immediate area and restricting activities in a surrounding buffer zone.

Specific actions for each OCS region include:

Gulf of Mexico

Lease sales in the Western and Central Gulf of Mexico under the 2007-2012 program are currently scheduled to proceed in late 2011 and early 2012, after BOEMRE completes appropriate environmental analyses. The DOI will also soon begin public meetings and environmental analysis to inform decisions about when and where lease sales in portions of the Gulf of Mexico currently not under congressional moratorium will be held during 2012-2017. Most of the Eastern Gulf of Mexico planning area remains under a congressionally mandated drilling moratorium until 2022 and is not proposed for leasing in either the 2007-2012 program or the 2012-2017 program.

Alaska

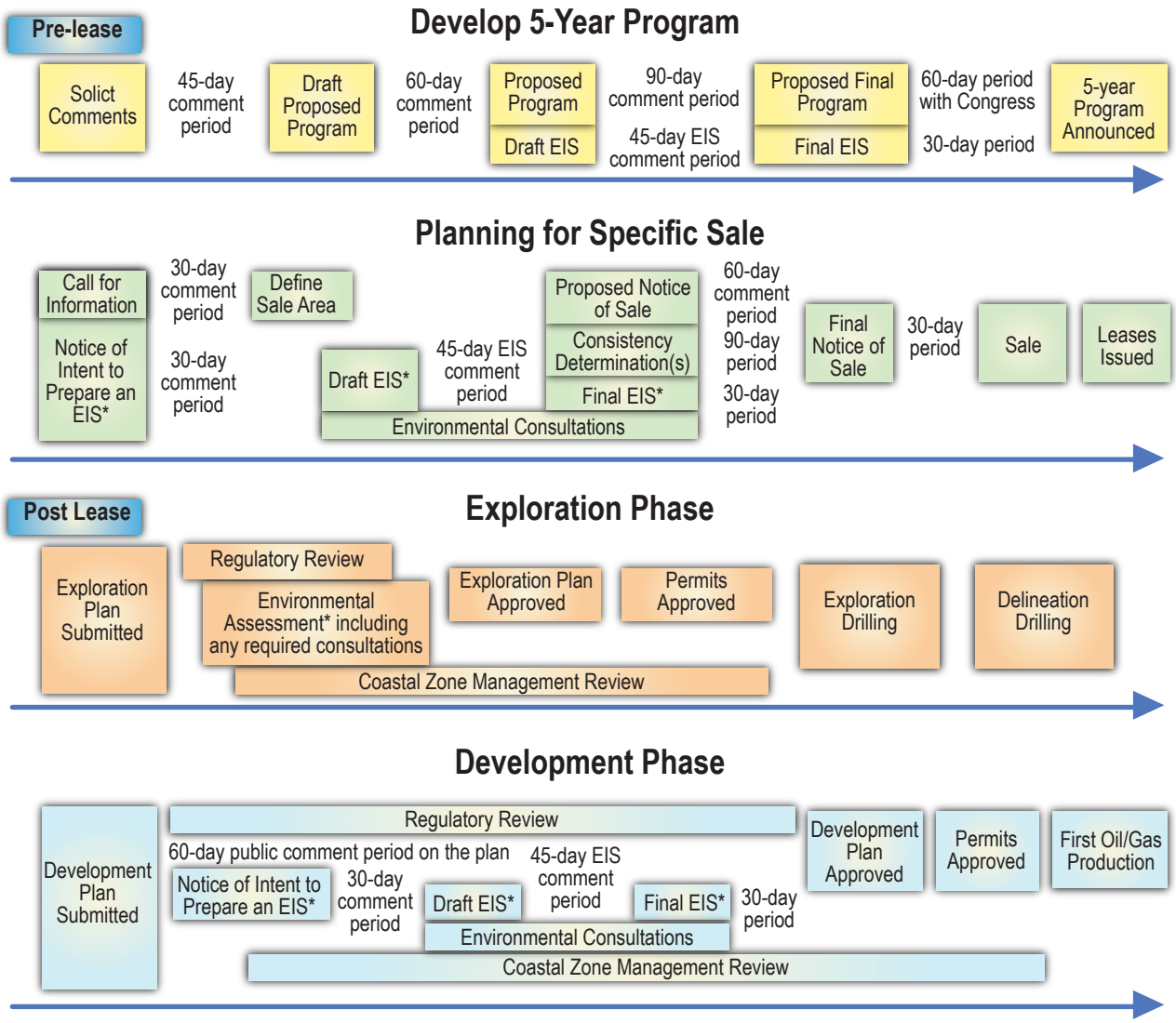
Offshore drilling in Alaska is under careful review and consideration by the DOI and BOEMRE. These efforts include scientific and environmental studies, public meetings, and additional analysis of oil spill response capabilities in the Arctic.

The BOEMRE recently held public meetings in Alaska to gather important public input and information for an EIS that will help inform Secretary Salazar's decision on whether and where to schedule Alaska lease sales under the 2012-2017 program. The public meetings covered the Beaufort, Chukchi, and Cook Inlet planning areas. In his March 31, 2010, announcement, the President withdrew the North Aleutian Basin (Bristol Bay) from consideration for leasing through 2017.

Decisions about the 2012-2017 program will be informed by an ongoing USGS evaluation of what is known about the resources, risks, and environmental sensitivities in Arctic areas and input from other Federal agencies, including the NOAA.

Though no further lease sales in the Chukchi and Beaufort Seas will be held under the 2007-2012 program, BOEMRE will continue to honor existing leases in the Arctic. The bureau is preparing additional environmental analysis of the area and is working closely with other Federal agencies that also must approve aspects of any proposed drilling activity, including the NOAA and the EPA.

For any drilling operation that is approved, BOEMRE will have safety personnel on site throughout the drilling operation to monitor the operation and hold the company accountable for compliance with BOEMRE's drilling safety and environmental regulations.



* Level of appropriate National Environmental Policy Act documentation to be determined based on the actual project proposed

Abbreviation: EIS - Environmental Impact Statement

The durations of comment periods are the minimum time frames required

Mid and South Atlantic

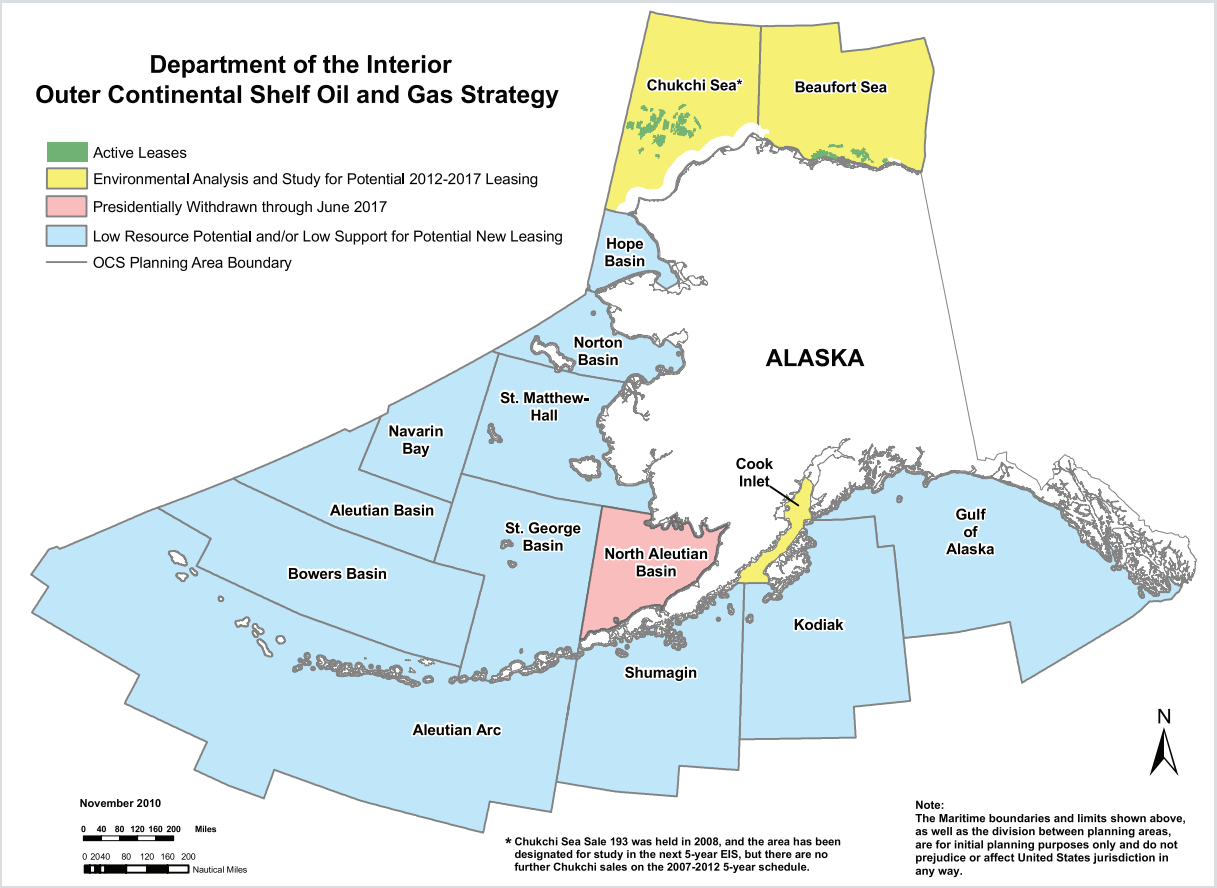
Because the potential oil and gas resources in the Mid and South Atlantic are not currently well known, the DOI is moving forward with an environmental analysis for potential seismic studies in the Mid and South Atlantic OCS to support conventional and renewable energy planning. No lease sales will be scheduled in the Atlantic in the 2007-2012 program or in the 2012-2017 program.

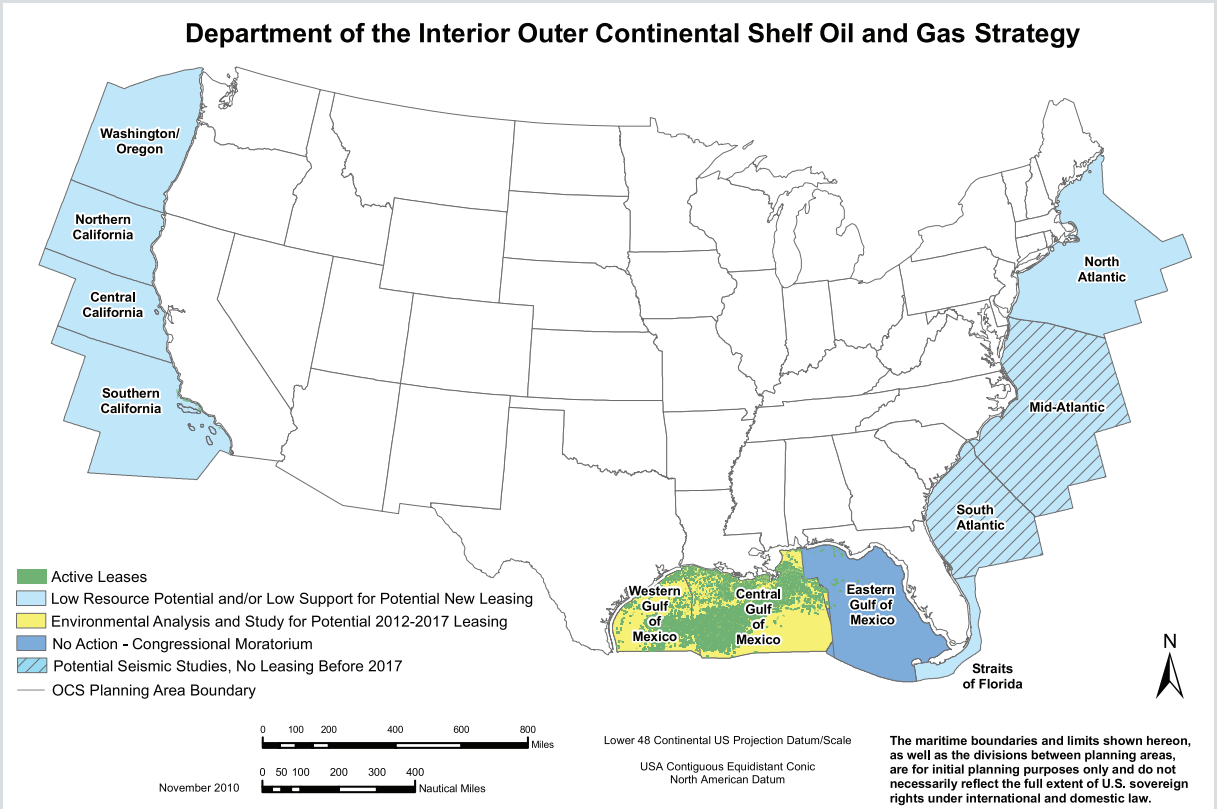
Pacific

Because of the lower resource potential and low support for potential new leasing, no lease sales are scheduled in the Pacific in the 2007-2012 program or in the 2012-2017 program.

Offshore
Oil and Gas

- The Outer Continental Shelf is a significant source of oil and gas for the Nation.
  - There are 37.9 million leased OCS acres that generally account for over 10 percent of America's domestic natural gas production and more than 25 percent of America's domestic oil production.
- BOEMRE's estimates of undiscovered technically recoverable oil and gas resources on the OCS (2006 mean estimates) total:
  - 86 billion barrels of oil
  - 420 trillion cubic feet of natural gas
- The OCS Lands Act requires the Department of the Interior to prepare a 5-year program that specifies the size, timing, and location of areas to be assessed for Federal offshore natural gas and oil leasing.
- Other offshore mineral production includes sand and gravel extracted for use in coastal restoration and beach replenishment projects.


Department of the Interior
Outer Continental Shelf Oil and Gas Strategy
Active Leases
Environmental Analysis and Study for Potential 2012-2017 Leasing
Presidentially Withdrawn through June 2017
Low Resource Potential and/or Low Support for Potential New Leasing
OCS Planning Area Boundary
Chukchi Sea*
Beaufort Sea
Hope Basin
Norton Basin
ALASKA
St. Matthew-Hall
Navarin Bay
Aleutian Basin
Bowers Basin
St. George Basin
North Aleutian Basin
Cook Inlet
Gulf of Alaska
Kodiak
Shumagin
Aleutian Arc
N
November 2010
0 40 80 120 160 200 Miles
0 2040 80 120 160 200 Nautical Miles
* Chukchi Sea Sale 193 was held in 2008, and the area has been designated for study in the next 5-year EIS, but there are no further Chukchi sales on the 2007-2012 5-year schedule.
Note:
The Maritime boundaries and limits shown above, as well as the division between planning areas, are for initial planning purposes only and do not prejudice or affect United States jurisdiction in any way.


Department of the Interior Outer Continental Shelf Oil and Gas Strategy
Washington/ Oregon
Northern California
Central California
Southern California
North Atlantic
Mid-Atlantic
South Atlantic
Western Gulf of Mexico
Central Gulf of Mexico
Eastern Gulf of Mexico
Straits of Florida
Active Leases
Low Resource Potential and/or Low Support for Potential New Leasing
Environmental Analysis and Study for Potential 2012-2017 Leasing
No Action - Congressional Moratorium
Potential Seismic Studies, No Leasing Before 2017
OCS Planning Area Boundary
N
0 100 200 400 600 800 Miles
0 50 100 200 300 400 Nautical Miles
November 2010
Lower 48 Continental US Projection Datum/Scale
USA Contiguous Equidistant Conic
North American Datum
The maritime boundaries and limits shown hereon, as well as the divisions between planning areas, are for initial planning purposes only and do not necessarily reflect the full extent of U.S. sovereign rights under international and domestic law.

5.3.2 Interagency Coordination

Throughout the 5-Year OCS Oil and Gas Leasing Program, individual sale, and regulatory processes, BOEMRE consults with various Federal, state, and local agencies that share a stewardship role in managing the OCS. BOEMRE consults with the NOAA and FWS to meet requirements of the Endangered Species Act and the Marine Mammal Protection Act. BOEMRE meets with tribal leaders in accordance with government-to-government consultation requirements and to incorporate their views in decisions.

Exploration and production activities proposed to BOEMRE for approval must undergo environmental reviews by other Federal agencies in compliance with more than 10 statutes, executive orders, and international agreements, in addition to the extensive environmental analysis required under NEPA. For example, proposed activities are examined for potential impacts to: endangered and threatened species and any designated critical habitat under the Endangered Species Act; fish and essential fish habitat under the Magnuson-Stevens Fishery Conservation and Management Act; and cultural resources under the National Historic Preservation Act. Evaluations of potential effects on marine mammals, birds, coral reefs, water quality, air quality, Indian sacred sites, and environmental justice also take place under separate consultation processes. Further, BOEMRE coordinates with affected states under the Coastal Zone Management Act to ensure any BOEMRE-approved activities are consistent with a state's federally approved coastal management program. All of these environmental reviews are considered by BOEMRE, along with the NEPA analysis, to make decisions on whether to approve an activity, and if so, what mitigation and monitoring measures must be put in place to eliminate or minimize any potential adverse affects to these valuable marine resources.

In addition to the coordination mentioned above, the MMS (now BOEMRE) entered into an MOU with the U.S. Coast Guard (USCG) in 2004. The BOEMRE interacts with the USCG on a multitude of mission areas at all levels from headquarters down to the field units. For example, BOEMRE is authorized to oversee the Fixed Platform Self-Inspection Program on behalf of the USCG, and frequently exchanges information with the USCG to clarify policy issues and provide compliance statistics. The BOEMRE also interacts with the USCG at the region and district levels to coordinate overlapping areas of offshore inspection and accident investigation field activities.

The BOEMRE has been consulting with the military for more than 25 years at both the planning and operational stages to ensure that each agency meets the requirements of its mission while not unduly interfering with the other agency. Coordination under a 1983 MOU between the DOI and the DOD has yielded no serious conflict. For example, seven military communication towers installed by the U.S. Air Force offshore Mobile, Alabama, support Air Combat Maneuvering Instrumentation, and BOEMRE coordinates with the Air Force to ensure noninterference with military operations in that area. Oil and gas activities are restricted so that no activity can take place within 500 feet of a tower site, and unobstructed lines of sight must be maintained between towers. The MOU is in the process of being updated to more accurately reflect the current status of the OCS and the new offshore renewable energy program.

5.3.3 Siting and Operational Considerations

The 5-Year OCS Oil and Gas Leasing Program, required under Section 18 of the OCS Lands Act, includes a 5-year schedule of proposed lease sales that shows size, timing, and location of potential

leasing activity as precisely as possible. The OCS Lands Act mandates that the 5-year program must balance the priorities of meeting national energy needs, ensures environmentally sound and safe operations, and assures receipt of fair market value to the taxpayer. Before any particular lease sale is considered, it must be included in an approved 5-year program.

The process to develop a 5-year program includes three separate comment periods, two draft proposals, a final proposal, and the development of an EIS that informs the Secretary's decisionmaking. During this process, BOEMRE evaluates: the economic, social, and environmental values of renewable and nonrenewable resources in the OCS; the potential impact of oil and gas exploration on other OCS resource values; and the potential impact on marine, coastal, and human environments.

Throughout the stages of developing the 5-year program, BOEMRE analysis is based on science and research obtained through the BOEMRE Environmental Studies Program, the BOEMRE Technology Assessment and Research Program, and studies from other sources such as other Federal and state agencies, the National Academy of Sciences, and universities.

5.3.4 Permitting Procedures and Requirements

The BOEMRE's regulatory framework encompasses a variety of components that address environmental, safety, and conservation issues. This framework includes a three-tiered approach to regulation, relying upon prescriptive requirements, performance-based goals, and consensus-based technical standards incorporated into BOEMRE regulations. Section 21(b) of the OCS Lands Act requires the use of best available and safest economically feasible technologies, and BOEMRE has incorporated 97 technical standards into BOEMRE regulations.

The BOEMRE recently issued a tough new drilling safety rule along with new requirements for operators to institutionalize safety in their operational processes. The DOI believes these new rules will substantially improve the safety of new offshore drilling. The BOEMRE continues to review its regulations and will further update and strengthen them in the near future to ensure the most effective requirements for promoting safety and environmental protection on the OCS.

Once a lease has been issued, a lessee/operator must submit plans for BOEMRE approval before beginning any activity. The lessee/operator must meet certain criteria documented in a site-specific exploration plan before beginning exploratory drilling on a lease. If exploration results are favorable, the lessee/operator moves to the production and development phase of its operations. The lessee/operator must submit a development and production plan or a development operations coordination document. In water depths greater than 400 feet, the lessee/operator must also submit a deepwater operations plan and a conservation information document.

The purpose of the deepwater operations plan is to ensure that BOEMRE has sufficient information to review any development project that uses nonconventional production or completion technology (in most cases, floating or subsea production systems) from a total systems approach.

The BOEMRE evaluates the system to determine whether the project will be properly developed, particularly from the standpoint of operational safety and environmental protection issues. The BOEMRE also utilizes the conservation information document to ensure that all economically producible reservoirs are developed.

Each exploration plan, development and production plan, or development operations coordination document must demonstrate that the proposed activities are conducted in a manner that:

- Conforms to Federal laws and regulations;
- Is safe;
- Prevents waste, conserves natural resources, and protects Federal interests;
- Does not unreasonably interfere with other uses of the OCS; and
- Does not cause undue or serious harm or damage to the human, marine, or coastal environment.

An APD must be submitted to BOEMRE for each and every well drilled on the OCS. Written approval is required before an operator may begin to drill any well, sidetrack, or bypass, or to deepen an existing well. The BOEMRE requires each lessee/operator to take necessary precautions to keep wells under control at all times. The BOEMRE is in the process of strengthening its processes for reviewing applications for permit to drill, prior to approval. Companies must also meet oil spill financial responsibility requirements prior to drilling.

Oil Spill Program

The Oil Pollution Act of 1990 and Executive Order 12777 give the DOI and BOEMRE authority over oil spill planning and preparedness for facilities in state and Federal offshore waters that handle, store, or transport oil (excluding deepwater ports).

The BOEMRE and the USCG are actively engaged in numerous activities related to oil spill planning, preparedness, and response in Federal offshore waters. Recognizing the unique distribution of authority related to the subject as set forth in the Oil Pollution Act, and the need to clarify roles and responsibilities, BOEMRE and the USCG entered into a memorandum of agreement (MOA OCS-03) in May 2007. The document addresses oil spill response plans, unannounced drills, equipment inspections, oil spill response training, spill management team training, oil spill financial responsibility, oil spill response, pollution events databases, enforcement, interagency training, and area committees.

Implementation of the various components of the memorandum has been ongoing. For instance, BOEMRE conducts approximately 20 unannounced table top oil spill exercises, some of which require deployment of response equipment, on an annual basis. Staff conducting the exercises routinely invites USCG sector staff to participate in the exercises as the Federal on-scene coordinator or serve in other positions within the unified command. The USCG staff is also routinely invited to participate in BOEMRE unannounced oil spill response equipment inspections that are conducted for oil spill removal organizations with equipment listed in BOEMRE approved oil spill response plans. In another initiative, plans are underway to establish a digital means by which the USCG can access oil spill response plans for review and comment. And, in the area of training, BOEMRE staff was allowed to attend a USCG-sponsored training session at the BOEMRE National Oil Spill Response Test Facility (OHMSETT) in Leonardo, New Jersey. During offshore discharges, BOEMRE serves a critical role to the Federal on-scene commander by providing engineering and technical expertise on offshore facilities. Further, BOEMRE often provides the USCG data on responsible parties for offshore spills and works with the National Pollution Funds Center in cases involving re-

sponse claims. At the national level, BOEMRE has a representative on the National Schedule Coordination Committee of the National Preparedness for Response Exercise Program.

Senior management of both agencies meets several times per year to address priority issues. At the last meeting held at USCG headquarters, oil discharge planning, preparedness, and response were key topics resulting in a joint recommendation by BOEMRE Director Michael Bromwich and USCG Rear Admiral Brian Salerno. The recommendation states that a special work group be implemented to look at lessons learned from the Deepwater Horizon event and to identify any regulatory gaps.

The BOEMRE Oil Spill Program was established to oversee planning and preparedness activities of operators of regulated facilities in offshore waters. The goal of the program is to ensure that, during a response, those who will operate oil spill response equipment or serve on management teams are prepared to do so in a manner that prevents or minimizes safety hazards to responders and the public as well as negative impacts to the environment.

Affected offshore operators must prepare an oil spill response plan for BOEMRE approval that includes details on how they will respond to a worst-case discharge scenario from both nearshore and far-shore locations. Contents of oil spill response plans include spill management team members, certification of contracts with oil spill removal organizations, notification requirements, sensitive resources, dispersant use plans, platform and pipeline information, and specific emergency management procedures. Further, BOEMRE conducts unannounced oil spill drills to verify that operators are prepared to quickly and efficiently respond to a spill from one of their facilities.

5.3.5 Monitoring and Compliance Over the Life of the Project

The BOEMRE conducts announced and unannounced inspections of OCS facilities and any vessels engaged in drilling or downhole operations to determine whether an operator's performance is acceptable year-round. Inspections foster a climate of safe operations, maintain a BOEMRE presence, and focus on operators with a poor performance record. Noncompliance with requirements for specific installations or procedures is followed by prescribed enforcement actions consisting of written warnings or shut-ins of platforms, zones (wells), equipment, or pipelines. In the event noncompliance is detected, the inspector takes the appropriate enforcement action. If an operator is found in violation of a safety or environmental requirement, a citation is issued requiring that it be in compliance within 7 days. The violation may call for the particular well component, production component, or the entire complex to be shut-in. The Secretary also has other remedies, including the assessment of civil penalties for failure to comply with responsibilities under the law, license, permit, or any regulation or order issued. As with other safety-related aspects of BOEMRE operations, the agency is in the process of making major improvements to its inspection and monitoring programs, including efforts to substantially increase the agency's engineering and inspection workforce, develop more aggressive inspection protocols, and evaluate creative new ways to improve oversight (e.g., monitoring key drilling processes through the review of real-time data sent to an onshore operations center).

5.3.6 Restoration and Reclamation

The BOEMRE requires site clearance at the end of a lease. Regulations are found in the OCS Lands Act at 30 CFR 256, subpart Q. The

BOEMRE lease form, Section 22, Removal of Property No Longer Useful and Upon Termination of Lease, states:

> The Lessee shall remove all devices, works, and structures from the premises when no longer useful to operations, but no later than 1 year after termination of this lease in whole or in part except with the expressed permission of the Regional Supervisor. Such decommissioning operations shall be carried out in a safe and timely manner and in accordance with applicable laws and regulations. The Director may require decommissioning at any time. However, the Lessee may, with the approval of the Director, continue to maintain devices, works, and structures on the leased area for drilling or producing on other leases.

5.3.7 Bonding

The BOEMRE requires a general surety bond on every OCS oil and gas lease, based upon the potential level of activity on that lease: no operational activity, exploration activity (wells), or development activity (wells and facilities). In addition, a supplemental bond is required to cover a lessee's liability for facility abandonment and site clearance. The estimated cost for these activities is determined pursuant to supplemental bond procedures and available data. The BOEMRE reviews the information, and based on historical data and industry information, the decommissioning amounts and supplemental bonds can be adjusted.

6.0 Conclusion

"Each of us has a part to play in a new future that will benefit all of us. As we recover from this recession, the transition to clean energy has the potential to grow our economy and create millions of jobs—but only if we accelerate that transition. Only if we seize the moment. And only if we rally together and act as one nation—workers and entrepreneurs; scientists and citizens; the public and private sectors."

President Obama, June 15, 2010

President Obama has said consistently that the only way to avoid oil price spikes—like the one the Nation is experiencing today and those experienced over almost four decades since the first oil embargo in 1973—will ultimately be to transition away from today's heavy reliance on oil resources. The President has committed significant investments to clean energy so as to reduce America's dependence on oil and its vulnerability to fluctuations in oil prices and the stability of unfriendly regimes abroad.

As the President stated on March 11, 2011, "(T)he bottom line is this. We've been having this conversation for nearly four decades now. Every few years, gas prices go up; politicians pull out the same old political playbook, and then nothing changes. And when prices go back down, we slip back into a trance. And then when prices go up, suddenly we're shocked. I think the American people are tired of that. I think they're tired of talk. We've got to work together—Democrats, Republicans, and everybody in between—to finally secure America's energy future. I don't want to leave this for the next President, and none of us should want to leave it for our kids."

The Administration is committed to clean energy development as an avenue for progressing toward energy security. In pursuit of this objective, the Administration set an ambitious goal of doubling renewable energy generation capacity within 3 years. The Administration also recognizes that traditional sources of energy will continue to play an important role in achieving our energy goals, including reducing our dependence on foreign energy sources.

The Departments of the Interior and Agriculture manage 700 million acres of Federal land, 700 million acres of onshore subsurface mineral estate, and energy resources on the 1.7 billion acres that comprise the OCS. Although these areas have long been a significant source of mineral exploration and development, they have not been extensively used to develop renewable energy resources.

The Administration will continue to ensure that land use decisions and authorizations for expanding new energy development minimize its potential footprint and impacts on other resource values. Siting and permitting processes for various forms of energy development will include, as a key element, techniques that protect and restore sensitive landscapes and habitats for wildlife. Moreover, the Administration will continue to take the appropriate steps to put necessary reforms in place to ensure mitigation and protection of our public lands and resources while providing for the production of energy, both renewable and conventional, from Federal lands and offshore areas.

7.0 Appendices

7.1 Appendix 1

Secretarial Order on Developing Renewable Energy

THE SECRETARY OF THE INTERIOR

WASHINGTON

ORDER NO. 3285, Amendment No. 1 (Amended material italicized)

SIGNATURE DATE: February 22, 2010

Subject: Renewable Energy Development by the Department of the Interior

Sec. 1 Purpose. This Order establishes the development of renewable energy as a priority for the Department of the Interior and establishes a Departmental Task Force on Energy and Climate Change. This Order also amends and clarifies Departmental roles and responsibilities to accomplish this goal.

Sec. 2 Background. The Nation faces significant challenges to meeting its current and future energy needs. Meeting these challenges will require strategic planning and a thoughtful, balanced approach to domestic resource development that calls upon the coordinated development of renewable resources, as well as the development of traditional energy resources. Many of our public lands possess substantial renewable resources that will help meet our Nation's future energy needs while also providing significant benefits to our environment and the economy. Increased production of renewable energy will create jobs, provide cleaner, more sustainable alternatives to traditional energy resources, and enhance the energy security of the United States by adding to the domestic energy supply. As the steward of more than one-fifth of our Nation's lands, and neighbor to other land managers, the Department of the Interior has a significant role in coordinating and ensuring environmentally responsible renewable energy production and development of associated infrastructure needed to deliver renewable energy to the consumer.

Sec. 3 Authority. This Order is issued under the authority of Section 2 of Reorganization Plan No. 3 of 1950 (64 Stat. 1262), as amended, and pursuant to the provisions of Section 211 of the Energy Policy Act of 2005 (P.L. 109-58).

Sec. 4 Policy. Encouraging the production, development, and delivery of renewable energy is one of the Department's highest priorities. Agencies and bureaus within the Department will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable

energy and associated transmission while protecting and enhancing the Nation's water, wildlife, and other natural resources.

Sec. 5 Energy and Climate Change Task Force. A Task Force on Energy and Climate Change is hereby established in the Department. The Task Force reports to the Energy and Climate Change Council. The Deputy Secretary and the Counselor to the Secretary shall serve as Co-Chairs. At the discretion of the Co-chairs, the Task Force may draw on separate bureau and Assistant Secretary representation, as appropriate, to concentrate on the renewable energy agenda. The Task Force on Energy and Climate Change shall:

a. develop a strategy that is designed to increase the development and transmission of renewable energy from appropriate areas on public lands and the Outer Continental Shelf, including the following:

   (1) quantifying potential contributions of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy;

   (2) identifying and prioritizing the specific locations in the United States best suited for large-scale production of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy (e.g., renewable energy zones);

   (3) identifying, in cooperation with other agencies of the United States and appropriate state agencies, the electric transmission infrastructure and transmission corridors needed to deliver these renewable resources to major population centers;

   (4) prioritizing the permitting and appropriate environmental review of transmission rights-of-way applications that are necessary to deliver renewable energy generation to consumers;

   (5) establishing clear roles and processes for each bureau/office;

   (6) tracking bureau/office progress and working to identify and resolve obstacles to renewable energy permitting, siting, development, and production;

   (7) identifying additional policies and/or revisions to existing policies or practices that are needed, including possible revisions to the Geothermal, Wind, and West-Wide Corridors Programmatic Environmental Impact Statements and their respective Records of Decisions; and

   (8) working with individual states, tribes, local governments, and other interested stakeholders, including renewable generators and transmission and distribution utilities, to identify appropriate areas for generation and necessary transmission;

b. develop best management practices for renewable energy and transmission projects on the public lands to ensure the most environmentally responsible development and delivery of renewable energy;

c. establish clear policy direction for authorizing the development of solar energy on public lands; and

d. recommend such other actions as may be necessary to fulfill the goals of this Order.

Sec. 6 Responsibilities.

a. Program Assistant Secretaries. Program Assistant Secretaries overseeing bureaus responsible for, or that provide assistance with, the planning, siting, or permitting of renewable energy generation and transmission facilities on the public lands and on the Outer Continental Shelf, are responsible for:

(1) establishing and participating in management structures that facilitate cooperation, reporting, and accountability across agencies, including the Task Force on Energy and Climate Change;

(2) establishing joint, single-point-of contact offices that consolidate expertise to ensure a coordinated, efficient, and expeditious permitting process while ensuring appropriate siting and compliance with the National Environmental Policy Act, the Endangered Species Act, and all other applicable laws; and

(3) working collaboratively with other departments, state, and local authorities to coordinate and harmonize non-Federal permitting processes.

b. Assistant Secretary – Policy, Management and Budget. The Assistant Secretary – Policy, Management and Budget is a member of the Task Force and shall:

(1) ensure that investments associated with Interior managed facilities meet Federal standards for energy efficiency and greening applications; and

(2) coordinate with the Energy and Climate Change Task Force, as appropriate.

c. Bureau Heads. Each bureau head is responsible for designating a representative to the Task Force on Energy and Climate Change.

Sec. 7 Implementation. The Deputy Secretary is responsible for ensuring implementation of this Order. This responsibility may be delegated as appropriate.

Sec. 8 Effective Date. This Order is effective immediately and will remain in effect until its provisions are converted to the Departmental Manual or until it is amended, superseded, or revoked, whichever comes first.

/s/ Ken Salazar

Secretary of the Interior

SO#3285A1 2/22/10

7.2 Appendix 2

Inquiries and Proposals for Wind Energy on National Forest System Lands

Numerous inquiries have been received from companies regarding the siting of meteorological towers (met towers) which are needed to obtain viable wind data. The following table displays those inquiries and/or wind energy proposals on National Forest System lands.

Meteorological Tower Inquiries and Wind Energy Proposals on National Forest System Lands

Region	Forest	Purpose	Stage of Development	Who
1	Dakota Prairie National Grasslands	Inquiry: met tower - wind	Wind testing	EWindfarm, Inc.
2	Arapaho and Roosevelt National Forests	Proposal: met tower - wind	To install met towers	Clear Creek Power
2	Pawnee National Grassland	Inquiry: wind	Wind testing	Clear Creek Power
2	White River National Forest	Proposal: wind	Serves as power for ski area and grid	Snowmass
2	Medicine Bow and Routt National Forests	Proposal: 3 – met towers	National Environmental Policy Act (NEPA) underway	
2	Grand Mesa, Uncompahgre, and Gunnison National Forests	Inquiry: wind	Wind testing	
3	Cibola National Forest	Application: met tower	Wind testing	NextEra Energy Resources
4	Humboldt-Toiyabe National Forest	Permitted: 1 – met tower	Wind testing	
4	Salmon-Challis National Forest	Permitted: 1 – met tower	Ongoing wind testing for several years	Salmon River Electric Cooperative, Inc.
4	Sawtooth National Forest	Proposal: met towers	Currently processing	enXco
5	Lassen National Forest	Permitted: met tower	Wind testing	Horizon Wind Energy
5	Los Padres National Forest	Proposal: wind	Wind testing	Coram FS Development, LP
5	Modoc National Forest	Inquiry: met towers	Wind testing	Ewind Ltd.
5	Plumas National Forest	Proposal: met towers	Wind testing	Ewind Ltd., Horizon Wind Energy

Meteorological Tower Inquiries and Wind Energy Proposals on Naitonal Forest System Lands (continued):

Region	Forest	Purpose	Stage of Development	Who
5	San Bernardino National Forest	Permitted: met towers	Wind testing	Debenham Energy, LLC
6	Fremont-Winema National Forests	Permitted: met towers	Wind testing; application to install a 159 wind turbine farm	Ridgeline Energy, LLC
8	Cherokee National Forest	Inquiry: met tower	Wind testing	Freedom Work
8	Ouachita National Forest	Inquiry: met tower	Wind testing	Electric Coop
8	NC	Inquiry: met tower	Wind testing	British Petroleum
9	Green Mountain National Forest	Proposal: wind farm	NEPA underway: Deerfield Wind Project	

7.3 Appendix 3
Environmental Laws and Regulations

Besides the basic land management legislative authorities, onshore and offshore energy development projects on Federal lands are subject to full compliance with all environmental laws and regulations. These include, but are not limited to:

American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996); Executive Order 13007, "Indian Sacred Sites" (May 24, 1996): Requires Federal agencies to facilitate Native American access to and ceremonial use of sacred sites on Federal lands, to promote greater protection for the physical integrity of such sites, and to maintain the confidentiality of such sites, where appropriate.

Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940: Prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof."

Clean Air Act, as amended (42 U.S.C. 7401 et seq.): Prohibits Federal agencies from providing financial assistance for, or issuing a license or other approval to, any activity that does not conform to an applicable, approved implementation plan for achieving and maintaining the National Ambient Air Quality Standards.

Clean Water Act, Section 311, as amended (33 U.S.C. 1321), Executive Order 12777, "Implementation of Section 311 of the Federal Water Pollution Control Act of October 18, 1972, as Amended, and the Oil Pollution Act of 1990:" Prohibits discharges of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the OCS Lands Act, or which may affect natural resources belonging to the United States.

Coastal Zone Management Act, as amended (16 U.S.C. 1451 et seq.): Specifies that coastal States may protect coastal resources and manage coastal development. A State with a coastal zone management program approved by the National Oceanic and Atmospheric Administration may deny or restrict development off its coast if the reasonably foreseeable effects of such development would be inconsistent with the State's coastal zone management program.

Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.): Requires Federal agencies to consult with the FWS and the National Marine Fisheries Service to ensure that proposed Federal actions are not likely to jeopardize the continued existence of any species listed at the Federal level as endangered or threatened, or result in the destruction or adverse modification of critical habitat designated for such species.

Energy Policy Act of 2005 (Public Law 109-58): Includes provisions for renewable energy that are intended to increase production and use, advance technology development, and promote commercial development. Other provisions establish resource assessments, Federal purchases of equipment and electricity, Federal land leasing, and grants, all of which are subject to appropriations. Provisions are also included to increase development of conventional energy resources from Federal lands, including measures to increase access to Federal lands by energy projects — such as drilling activities, electric transmission lines, and gas pipelines.

Federal Power Act (16 U.S.C. 792 et seq.): Governs licensing of hydropower development on Federal lands and the OCS.

Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401): Requires consultation with the Fish and Wildlife Service and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources."

National Historic Preservation Act of 1966, as amended (16 U.S.C. 470-470t) and **Archaeological and Historical Preservation Act of 1974** (16 U.S.C. 469-469c-2): Require each Federal agency to consider what effect Federal undertakings may have on historic properties and to consult with other parties, including the Advisory Council on Historic Preservation, appropriate the State or Tribal Historic Preservation Officer before allowing a federally licensed activity to proceed in an area where cultural or historic resources might be affected by the undertaking; authorizes the Interior Secretary to undertake the salvage of archaeological data that may be lost due to a Federal project.

National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.): Requires Federal agencies to prepare an EIS to evaluate the potential environmental impacts of any proposed major Federal action that would significantly affect the quality of the human environment, and to consider alternatives to such proposed actions.

Outer Continental Shelf Lands Act, as amended (43 U.S.C 1331 et seq.): Governs energy and mineral leasing and development on the OCS, i.e., all submerged lands lying seaward of state coastal waters that are under U.S. jurisdiction.

Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 et seq.): Requires hazardous waste treatment, storage, and disposal facilities to demonstrate in their permit applications that design and operating standards established by the EPA (or an authorized State) will be met.

Responsibilities of Federal Agencies to Protect Migratory Birds, Executive Order 13186, January 10, 2001: Requires that Federal agencies taking actions likely to negatively affect migratory bird populations enter into Memoranda of Understanding with the FWS, which, among other things, ensure that environmental reviews mandated by NEPA evaluate the effects of agency actions on migratory birds, with emphasis on species of concern.

Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 401 et seq.): Delegates to the U.S. Army Corps of Engineers the authority to review and regulate certain structures and activities that are located in or affect the navigable waters of the U.S. The OCS Lands Act explicitly extends this authority to the seaward limit of Federal jurisdiction.

7.4 Appendix 4
Memorandum of Understanding for Hydropower

MEMORANDUM OF UNDERSTANDING FOR HYDROPOWER
Among
THE DEPARTMENT OF ENERGY, THE DEPARTMENT OF THE INTERIOR
And
THE DEPARTMENT OF THE ARMY

Purpose: To help meet the Nation's needs for reliable, affordable, and environmentally sustainable hydropower by building a long-term working relationship, prioritizing similar goals, and aligning ongoing and future renewable energy development efforts between the U.S. Department of Energy (DOE), the Department of the Interior (DOI), and the Department of the Army (DOA), through the U.S. Army Corps of Engineers (USACE) (collectively the "Agencies"), the Agencies enter into this Memorandum of Understanding (MOU).

I. BACKGROUND

As the largest source of renewable electricity generation in the U.S., hydropower provides a wide range of benefits to the Country. Hydropower is a minimal emission, low-cost source of energy that can be relied upon for long-term, stable production of domestic electricity. Hydropower also provides consistent, reliable generation which can be quickly adjusted and dispatched to meet the various needs of the electric grid.

The Agencies recognize that not every site is appropriate for new or increased hydropower production. New hydropower development must be sustainable and take into account the need to maintain healthy river ecosystems. The Agencies also recognize that historically dams have had impacts that go well beyond project boundaries, including significant impacts on ecosystems and the fish and wildlife that inhabit them. This MOU is intended to represent a new approach to hydropower development that will harmonize the production of clean, renewable power generation with avoidance or reduction of environmental impacts and maintenance or enhancement of the viability of ecosystems.

This MOU will focus both on increasing renewable energy generation from Federal hydropower facilities and reducing the environmental impact sometimes associated with historical hydropower development in the United States by focusing on sustainable, low impact, and small hydropower projects. The Agencies will identify specific Federal facilities and lands owned or controlled by the United States that are well-suited as sites for environmentally sustainable hydropower energy development. This new approach to hydropower development will advance projects that are superior in terms of environmental sensitivity to many other types of energy production and development. The Agencies will take advantage of untapped potential by increasing the generation of hydropower at existing facilities and dams through retrofits or modifications to increase hydropower production in a manner that will pose fewer of the potential environmental concerns that may be associated with the development of new dams and hydropower projects. For example, such efforts would include initiating efficiency and/or capacity upgrades at current generation facilities.

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The Agencies will also study adding generation capacity to currently unpowered dams or constructed waterways and will prioritize those projects which can be developed at existing facilities and appropriately balance increased energy generation with consideration of environmental impacts. The MOU will also focus on research and development and will promote new technologies, including fish-friendly and low-head turbines.

II. MISSION

The DOE, the USACE, and DOI will seek to use their respective authorities, programs, and resources synergistically to serve the Nation efficiently and effectively. They will work together to (1) support the maintenance and sustainable optimization of existing Federal and non-Federal hydropower projects, (2) elevate the goal of increased hydropower generation as a priority of each Agency to the extent permitted by their respective statutory authorities, (3) promote energy efficiency, and (4) ensure that new hydropower generation is implemented in a sustainable manner. The DOE, the USACE, and DOI will jointly focus each Agency's respective capabilities and resources to make innovative and sustainable improvements to the Nation's renewable energy portfolio, and promote the goal of energy efficiency through water conservation or improved water management.

III. GOALS

The DOE, DOI, and DOA collaboratively intend to develop solutions and best-practices to increase in a sustainable manner U.S. hydropower generation at Federal facilities and seek solutions to meet the integrated energy and water needs of future generations. DOE, DOI, and the DOA express the following energy partnership goals:

1. Enhance environmentally sustainable hydropower development and operation at federally-owned hydropower generation facilities in order to provide clean, reliable, and affordable energy to American consumers.

2. Focus on a new approach to development of hydropower which increases hydropower generation and improves ecosystem function through environmentally sustainable, low impact or small hydropower projects.

3. Identify specific Federal facilities and lands owned or controlled by the United States that are well-suited as sites for environmentally sustainable hydropower energy development, and collaborate on efforts to implement projects at these locations, including joint studies, demonstration projects, and other mutually supported partnership arrangements with private entities, Indian tribes, and state and Federal agencies.

4. Coordinate efforts to assess the potential additional hydropower capacity available at Federal hydropower facilities that is environmentally sustainable,

including fostering an understanding of the potential effects of climate change on future generation capability.

5. Collaborate with Indian tribes, the environmental community, the owners of non-Federal hydropower facilities, Federal and state agencies, and other stakeholders to identify river basins where integrated basin-scale hydropower opportunity assessments could help facilitate the move to a low-carbon future, including both environmental sustainability and the delivery of renewable energy.

6. Emphasize the critical role that hydropower can play in helping to integrate other renewable energy technologies into the U.S. electric grid.

7. Promote an environmentally responsible approach to enhancing hydropower development that recognizes the need to preserve biological diversity, ecosystem function, our natural and cultural heritage, and recreational opportunities, and also recognizes that some geographic locations are not appropriate for new hydropower development.

8. Conduct research and disseminate results from environmental studies, and encourage development of specific standards for and certification of environmentally sustainable hydropower.

9. Work to integrate energy and water policies at the Federal level not only to address the development of hydropower resources, but also to evaluate the use of non-hydropower renewable resources with water management operations, and promote water conservation as a means to realize species conservation, environmental and energy efficiency goals.

10. Investigate ways to responsibly facilitate the permitting process for Federal and non-Federal hydropower generation and other renewable energy projects at federally-owned and Indian Tribe facilities, by increasing coordination among the Agencies that have jurisdiction and reducing unnecessary delay, while ensuring that environmental impacts are fully considered.

11. Share information on renewable energy research and development (R&D) efforts being conducted by each Agency along with any results obtained. Prevent the duplication of efforts and highlight potential areas of collaboration and/or joint funding.

12. Apply collective knowledge and lessons learned from conventional hydropower development, deployment, and management to the emerging in-river hydrokinetic technologies.

13. Increase levels of both formal and informal communication and coordination between officials and staff at multiple levels of each Agency.

IV. ACTION ITEMS AND TARGET COMPLETION DATES

Cooperative management and technical collaboration efforts can help to: (1) improve resource management and protection; (2) improve public services and to make more efficient use of limited public funds; (3) provide a better understanding of all Agencies' goals, objectives, and programs; (4) minimize conflicts; and (5) leverage each Agency's limited resources. The Agencies have identified seven initial opportunities for collaboration and have identified action items to set forth our initial efforts to implement this MOU. As more is learned, other areas of potential cooperation and mutual interest are likely to develop, and this MOU may be modified to identify further actions to carry out the goals of this MOU. The MOU identifies "Champions" who will lead or co-lead implementation efforts.

A. Federal Facility Energy Resource Assessment
Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: Focus on opportunities at Federal facilities by assessing the potential of additional hydropower generation available at USACE and Reclamation facilities, and collaborate on joint projects to increase generation at identified facilities. Projects considered or undertaken are intended to complement, and not compete or conflict with any ongoing activities or projects at Federal facilities, and will need to involve all affected stakeholders throughout the planning process. Opportunities for increased generation include efficiency and/or capacity upgrades to existing facilities, improvements in water management practices, powering currently unpowered dams or other constructed waterways, and the addition of new pumped storage capacity. Opportunities for increasing generation while improving ecosystem function, such as hydropower production from bypass flows, will also be assessed. Also, the Agencies will assess the potential effects of climate change on Federal hydropower facilities and generation.

Initiative 1: Coordinate ongoing efforts at all three Agencies to improve resource data and identify specific Federal facilities or sites as good candidates for projects to increase hydropower generation (including in-river hydrokinetic projects). Ongoing efforts include, but are not limited to:

- DOE EERE's National Hydropower Assets Assessment Project (NHAAP) to identify the current state of the hydropower infrastructure in the U.S. (age, type, ownership, etc.), generation patterns from these assets, and effects of varying hydrologic conditions on generation.

- DOI Reclamation's efforts to survey its facilities and update the report on Potential Hydropower Development at Existing Federal Facilities under Section 1834 of the Energy Policy Act of 2005. The Section 1834 Report will identify potential environmental concerns. Future development on any Federal facility identified in the Section 1834 Report will include coordination

with the U.S. Fish and Wildlife Service, the National Park Service, and other entities with jurisdiction.

- DOA USACE's/DOI Reclamation's Hydropower Modernization Initiative (HMI) to survey their facilities, quantify the potential additional generation available, and identify the most suitable locations for upgrades. Actual implementation of the HMI will be in consultation with DOE and the Federal Power Marketing Administrations (PMA) and their power customers.

Action Items:

1. Include USACE and Reclamation representatives as members of the NHAAP Advisory Committee, and hold regular meetings to exchange available data/research from all ongoing efforts.
    a. Product – Hold meetings twice a year
    b. Schedule – Hold first meeting April 2010

2. As a result of ongoing work, produce a list of USACE and Reclamation facilities and sites best suited for upgrades or projects to increase generation in a sustainable manner.
    a. Product – Federal Facilities/Sites List
    b. Schedule – Completed by October 2010

Initiative 2: Explore opportunities for all the Agencies to jointly fund or solicit projects to increase generation at the identified Federal sites and facilities.

Action Items:

1. Develop a proposal with details for how projects identified in the Federal Facilities/Sites List could be funded. Options will include both Federal and non-Federal development at USACE and Reclamation sites and facilities.
    a. Product – Finalized Proposal
    b. Schedule – Completed by October 2010

Initiative 3: Coordinate efforts to complete the Hydropower Power Assessment called for in Section 9505 of the Omnibus Public Lands Act of 2009, P.L. 111-11. Evaluate the effects and risks associated with global climate change to water supplies available for hydropower power generation at Federal water projects, in consultation with each of the Federal PMAs, the United States Geological Survey, and other Federal and state authorities as appropriate.

Action Items:

1. Complete a report on the effects of global climate change on water supplies at Federal hydropower facilities and on power sales of the PMAs, based on best available scientific information. The report will include recommendations from the PMAs on potential changes in operation or contracting practices that could address these effects and risks of climate

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change. Potential adaption and mitigation strategies will also be identified.

a. Establish an interagency working group to plan and implement the required assessment and to provide long-term coordination for subsequent reports every 5 years.
b. Product – Report to Congress
c. Schedule – Submit Report to Congress by April 2011

B. Integrated Basin Scale Opportunity Assessments
Co-Champions: DOE EERE / DOI Reclamation / DOA USACE

Goal: A new basin-scale approach to hydropower and related renewable development that emphasizes sustainable, low impact or small hydropower and related renewable energies could identify ecosystems or river basins where hydropower generation could be increased while simultaneously improving biodiversity, and taking into account impacts on stream flows, water quality, fish, and other aquatic resources. The Agencies will collaborate with the environmental community, the owners of Federal and non-Federal hydropower facilities, potentially affected Federal land management agencies, Indian tribes and other stakeholders to identify river basins where renewable power generation and environmental sustainability could both be increased, with appropriate consideration of other values. These basin-scale studies will also evaluate whether there are opportunities in the basin to retrofit existing dams to increase generation while improving environmental conditions. The Agencies will build on the existing basin study programs and other ongoing research activities of all participants to investigate how such opportunities could potentially be developed. Activities within this section are intended to complement current initiatives or existing agreements pertaining to facilities and river-basins by providing additional tools, information and/or research for stakeholders.

Initiative 1: Collaborate with appropriate Agencies and stakeholders to (1) develop methodologies, (2) identify suitable river basins, and (3) select one or more basins for a basin-scale opportunity assessment pilot project. Develop consensus on specific actions that could be taken within that basin to achieve an increase in hydropower and related renewable generation *and* improve environmental sustainability.

Action Items:

1. Plan and hold an expert workshop to identify methodologies, tools, and strategies for conducting basin-scale hydropower opportunity assessments. Workshop participants will (1) identify basins suitable for a basin-scale approach with significant hydropower potential and environmental restoration opportunities, and (2) select and prioritize 1-3 basins for basin-scale assessment pilot projects.

2. Conduct one or more basin-scale assessment pilot studies consistent with the findings of the workshop described above, in partnership with representatives

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from appropriate environmental NGOs, Federal and state agencies, tribes, the hydropower industry, and other relevant stakeholders.

3. Draft and disseminate a report on the results of the pilot studies that includes a feasibility analysis for expansion of the basin-scale assessment model to other appropriate river basins.
    a. Product: Hold first workshop May 2010
    b. Schedule: Produce initial report 3 months after first workshop

C. Green Hydropower Certification
Champion: DOE EERE

Goal: Identification of new hydropower development projects that avoid or reduce environmental impacts. Collaborate with private companies, states, tribes, nongovernmental organizations, and other Federal agencies to explore the benefits of the certification of environmentally friendly hydropower projects, and identify types of hydropower projects that could be included under state or national renewable energy portfolio standards, or could be given other credit for clean energy produced.

Initiative 1: Work with multiple stakeholders and other agencies to review potential criteria and/or other evaluation methods for identifying sustainable, environmentally-friendly hydropower projects.

Action Items:

1. Initiate a series of stakeholder meetings with state and tribal governments, and environmental and other interest groups to gather information on concerns regarding environmental impacts of hydropower generation, and possible solutions/mitigation options. Meetings would be led by DOE, with participation and involvement by USACE, Reclamation, the PMAs, the U.S. Fish and Wildlife Service, the National Park Service, and other Federal agencies, and other industry representatives.
    a. Product – Conduct 3-4 meetings
    b. Schedule – Initiate in FY 2010

2. Based on stakeholder meetings, jointly develop a list of recommended criteria or processes that could be used to certify sustainable and environmentally friendly hydropower generation facilities, including conventional or hydrokinetic hydropower developments and/or pumped storage facilities.
    a. Product – Develop a list of recommended hydropower certification standards or criteria
    b. Schedule – Initiate in FY 2010

D. Federal Inland Hydropower Working Group
Co-Champions: DOE EERE / DOI

Goal: Convene and participate in a Federal Inland Hydropower Working Group composed of DOE, USACE, DOI, and all other Federal agencies involved in the regulation, management, or development of hydropower assets (including in-river and other emerging hydrokinetic technologies) in rivers and streams in the U.S.

Initiative 1: Hold quarterly, staff-level meetings via teleconference in order to update Federal agencies on the status of all initiatives, efforts, and projects related to hydropower. Also utilize these meetings to update project leads from the DOE, USACE, and DOI on the status of projects and define ongoing action items necessary to complete individual tasks listed in these Guidelines.

Action Items:

1. Involve other Federal agencies in the Working Group, and schedule first meeting.
    a. Product – Hold teleconference once every 3 months
    b. Schedule – Initiate in FY 2010

E. Technology Development and Deployment:
Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: Share information on R&D efforts being conducted by each Agency along with any results obtained. Prevent the duplication of efforts and highlight potential areas of collaboration and/or joint funding.

Initiative 1: Conduct yearly renewable energy R&D workshop to highlight current initiatives, results of past efforts, and future goals of each Agency.

Actions Items:

1. Convene a workshop to discuss ongoing federally funded efforts, initiatives, and technology R&D
    a. Product – Hold Workshop
    b. Schedule – Initiate in FY 2010

Initiative 2: Identify potential R&D deployment sites at or near USACE or Reclamation facilities for DOE or jointly funded technology development projects (including in-river and other emerging hydrokinetic technologies).

Actions Items:

1. Initiate a public process to identify facilities
    a. Product – An evolving list of appropriate facilities based on technologies being developed
    b. Schedule – Initiate in FY 2011

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2. Initiate demonstration projects
    a. Product – Deploy newly-developed technologies at identified facilities to increase the quantity and/or flexibility of hydropower generation.
    b. Schedule – Initiate in FY 2011

F. Renewable Energy Integration and Energy Storage:
Co-Champions: DOE EERE / DOI Reclamation

Goal: Emphasize the critical role that hydropower can play in working to integrate other renewable energy technologies into the U.S. electric grid.

Initiative 1: Conduct a technical, economic, and environmental feasibility analysis of environmentally sustainable potential pumped storage sites that could be developed at existing USACE and Reclamation facilities (including both powered and unpowered dams). This analysis will compile and incorporate previous research on pumped storage feasibility.

Action Items:

1. Establish scope and statement of work, coordinate roles of each Agency, and establish timeline for specific deliverables.
    a. Product – Collaboration Plan/Report
    b. Schedule – June 2010

Initiative 2: Collaborate with other Federal agencies and various industry stakeholders to assess the amounts and distribution of energy storage needed to effectively integrate other intermittent sources of renewable energy into the U.S. electric transmission grid.

Action Items:

1. Assess and report on all work of this nature occurring in DOE, DOI, and DOA, and coordinate with any similar projects taking place in other Federal agencies or occurring outside the Federal Government.

G. Regulatory Process:
Co-Champions: DOE EERE / DOA USACE / DOI Reclamation

Goal: The Agencies will work together and investigate ways to efficiently and responsibly facilitate the current Federal permitting process for Federal and non-Federal hydropower projects at Federal facilities, within existing authority.

Initiative 1: Collaborate with other Federal agencies to clarify the current permitting processes for projects and development occurring at Federal sites and facilities, and identify the most time-intensive and resource-intensive components of each process. Work with other Federal agencies to identify ways in which processes could be

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shortened by reducing unnecessary delay, streamlined or simplified for appropriate projects.

Action Items:

1. Hold a workshop with all Federal agencies involved in the permitting process, including the U.S. Fish and Wildlife Service, the National Park Service, the Bureau of Land Management, and others.
    a. Product – Collaborative Workshop
    b. Schedule – Complete by June 2010

2. Produce a report detailing the results of the workshop, and highlighting current requisite permits, overlapping areas of information required by permits, and lead times associated with each type of Federal permit.
    a. Product – Workshop Report
    b. Schedule – Complete 3 months after conclusion of Workshop

VI. COMMUNICATIONS AND COORDINATION

To foster the sharing of information and to facilitate contact between the Agencies, DOE, USACE and DOI should provide each respective Agency with a list of points of contacts responsible for program areas and other areas of mutual interest. In addition to the quarterly Federal Inland Hydropower Working Group teleconferences, these points of contact should communicate as needed. Early communication should improve public services consistent with the above mission statements for all Agencies through increased efficiency and avoidance of potential conflict. Coordination should occur for planning, programs, research and development, and other management actions of mutual interest. To the extent possible, each Agency should offer the other informal and formal opportunities to review and comment on proposed additions, changes, or updates to Agency guidelines, regulations, procedures, directives and policies that may have impacts on the programs and mission of the other Agency.

Implementation: The Agencies have mutually set performance goals and will foster a spirit of teamwork between the organizations at all levels to achieve the goals. The MOU sets out action items to accomplish these goals and also sets forth deadlines for completion of the action items. The Agencies intend to meet regularly to exchange information and collaborate in a variety of different manners to work toward the achievement of those goals to the extent that funding, resources, and staffing are available. The Agencies also agree to coordinate with and communicate action plans to Federal land management agencies and other interested parties.

Effective Date, Modification and Termination:

- This MOU will become effective upon the date of the last signature and remain in effect for a period of 5 years.

- Modifications to this MOU may be proposed by any signatory Agency (or designated representatives). Proposals for modification will be circulated to the receiving Agencies for a 30 calendar-day period of review. Approval of modifications will be indicated by written acceptance by the signatory agencies. Following acceptance by all Agencies, a revised MOU or amendment to the MOU will be circulated for execution.
- Participation in this MOU may be terminated by any signatory Agency. As a courtesy to the other signatory Agencies, a terminating Agency will endeavor to provide sixty (60) calendar days after providing written notice of such termination to the other signatory Agencies.

Qualifications and Limitations:

- Participation in this process does not imply endorsement of a proposed plan or project. Nothing in this Agreement is intended to diminish, modify, or otherwise affect the statutory or regulatory authorities of the signatory Agencies.
- This MOU is strictly for internal management purposes for each of the parties. It is not legally enforceable and shall not be construed to create any legal obligation on the part of any of the Agencies. This MOU shall not be construed to provide a private right or cause of action for or by any person or entity.
- This MOU is not a fiscal obligation document. Nothing in this Agreement authorizes or is intended to obligate the Agencies to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value. Each Agency will provide its own resources to meet the outlined objectives in an amount that they deem acceptable.
- When the Agencies agree to undertake joint projects with defined specific projects and goals, they will develop a separate written agreement for each project setting out each party's contribution, deliverables, and responsibilities.
- This MOU in no way restricts any of the Agencies from participating in any activity with other public or private agencies, organizations, or individuals.
- All agreements herein are subject to, and will be carried out in compliance with, all applicable laws, regulations, and other legal requirements.
- As used in this document, the term "collaboration" shall not include any practice prohibited by fiscal statutes including 31 U.S.C. § 1552, 31 U.S.C. § 1301, 31 U.S.C. § 1341, 31 U.S.C. § 1342, nor by any fiscal or ethics regulations specifically applicable to the individual Agencies, and shall not include any preferential treatment of any private organization nor access to any non-public, pre-decisional or procurement sensitive information. Further, all limitations stipulated in the Federal Rules of Acquisition are to be made for any collaboration under this memorandum and any addenda thereof.
- All partnerships and arrangements with private entities will comply with all authorities regulating relationships between the Federal Government and private entities.
- Nothing in this MOU is intended to create a committee subject to the requirements of the Federal Advisory Committee Act (5 U.S.C. App).

Statutory Authorities

DOE enters into this MOU under the authority of Section 646 of the Department of Energy Organization Act (Pub.L.95-91), as amended (42 U.S.C. §7256).
Reclamation enters into this MOU under the authority of the Act of June 17, 1902 (32 Stat. 388) and Acts amendatory thereof and supplementary thereto.
USACE enters into this MOU under Section 212 of the Water Resources Development Act 2000 (33 U.S.C. § 2321a) and the various project authorization for hydropower development.

Ken Salazar
Secretary
Department of the Interior

Steven Chu
Secretary
Department of Energy

Jo-Ellen Darcy
Assistant Secretary of the Army (Civil Works)
Department of the Army

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7.5 Appendix 5
Applicable Laws
Renewable Energy Development on the Outer Continental Shelf

Statute/Executive Order	Responsible Federal Agency/ Agencies	Summary of Pertinent Provisions
National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.)	Council on Environmental Quality	Requires Federal agencies to prepare an EIS to evaluate the potential environmental impacts of any proposed major Federal action that would significantly affect the quality of the human environment, and to consider alternatives to such proposed actions.
Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)	• U.S. Fish and Wildlife Service • National Oceanic and Atmospheric Administration	Requires Federal agencies to consult with the FWS and the NMFS to ensure that proposed Federal actions are not likely to jeopardize the continued existence of any species listed at the Federal level as endangered or threatened, or result in the destruction or adverse modification of critical habitat designated for such species.
Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361-1407)	• U.S. Fish and Wildlife Service • National Marine Fisheries Service	Prohibits, with certain exceptions, the take of marine mammals in U.S. waters by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States.
Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.)	National Marine Fisheries Service	Requires Federal agencies to consult with the NMFS on proposed Federal actions that may adversely affect Essential Fish Habitats that are necessary for spawning, breeding, feeding, or growth to maturity of Federally managed fisheries.
Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1401 et seq.)	• Environmental Protection Agency • U.S. Army Corps of Engineers (ACOE) • National Oceanic and Atmospheric Administration	Prohibits, with certain exceptions, the dumping or transportation for dumping of materials including, but not limited to, dredged material, solid waste, garbage, sewage, sewage sludge, chemicals, biological and laboratory waste, wrecked or discarded equipment, rock, sand, excavation debris, and other waste into ocean waters without a permit from the EPA. In the case of ocean dumping of dredged material, the ACOE is given permitting authority.
National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.)	National Oceanic and Atmospheric Administration	Prohibits the destruction, loss of, or injury to, any sanctuary resource managed under the law or permit, and requires Federal agency consultation on Federal agency actions, internal or external to national marine sanctuaries, that are likely to destroy, injure, or cause the loss of any sanctuary resource.
Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," January 10, 2001	U.S. Fish and Wildlife Service	Requires that Federal agencies taking actions likely to negatively affect migratory bird populations enter into Memoranda of Understanding with the FWS, which, among other things, ensure that environmental reviews mandated by NEPA evaluate the effects of agency actions on migratory birds, with emphasis on species of concern.

Statute/Executive Order	Responsible Federal Agency/ Agencies	Summary of Pertinent Provisions
Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management	Specifies that coastal States may protect coastal resources and manage coastal development. A State with a coastal zone management program approved by NOAA OCRM can deny or restrict development off its coast if the reasonably foreseeable effects of such development would be inconsistent with the State's coastal zone management program.
Clean Air Act, as amended (42 U.S.C. 7401 et seq.)	• Environmental Protection Agency • Bureau of Ocean Energy Management, Regulation and Enforcement	Prohibits Federal agencies from providing financial assistance for, or issuing a license or other approval to, any activity that does not conform to an applicable, approved implementation plan for achieving and maintaining the National Ambient Air Quality Standards (NAAQS). Requires EPA (or an authorized State agency) to issue a permit before construction of any new major stationary source or major modification of a stationary source of air pollution. The permit—called a Prevention of Significant Deterioration (PSD) Permit for stationary sources located in areas that comply with the NAAQS, and a Nonattainment Area Permit in areas that do not comply with the NAAQS—must control emissions in the manner prescribed by EPA regulations to either prevent significant deterioration of air quality (in attainment areas), or contribute to reducing ambient air pollution in accordance with an approved implementation plan (in nonattainment areas). Requires the owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process to submit a Risk Management Plan to EPA.
Clean Water Act, Section 311, as amended (33 U.S.C. 1321); Executive Order 12777, "Implementation of Section 311 of the Federal Water Pollution Control Act of October 18, 1972, as Amended, and the Oil Pollution Act of 1990"	• Environmental Protection Agency • Bureau of Ocean Energy Management, Regulation and Enforcement • U.S. Coast Guard	Prohibits discharges of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the OCS Lands Act, or which may affect natural resources belonging to the United States. Authorizes EPA and the USCG to establish programs for preventing and containing discharges of oil and hazardous substances from non-transportation-related facilities and transportation-related facilities, respectively. Directs the Secretary of the Interior (BOEMRE) to establish requirements for preventing and containing discharges of oil and hazardous substances from offshore facilities, including associated pipelines, other than deepwater ports.

Statute/Executive Order	Responsible Federal Agency/ Agencies	Summary of Pertinent Provisions
Marking of Obstructions (14 U.S.C. 86)	U.S. Coast Guard	The Coast Guard may mark for the protection of navigation any sunken vessel or other obstruction existing on the navigable waters or waters above the continental shelf of the U.S. in such manner and for so long as, in his judgment, the needs of maritime navigation require.
Clean Water Act, Sections 402 and 403, as amended (33 U.S.C. 1342 and 1343)	Environmental Protection Agency	Requires a National Pollutant Discharge Elimination System (NPDES) Permit from EPA (or an authorized State) before discharging any pollutant into territorial waters, the contiguous zone, or the ocean from an industrial point source, a publicly owned treatment works, or a point source composed entirely of storm water.
Clean Water Act, Section 404, as amended (33 U.S.C. 1344)	• U.S. Army Corps of Engineers • Environmental Protection Agency	Requires a permit from the ACOE before discharging dredged or fill material into waters of the United States, including wetlands.
Ports and Waterways Safety Act, as amended (33 U.S.C. 1221 et seq.)	U.S. Coast Guard	Authorizes the USCG to implement, in waters subject to the jurisdiction of the United States, measures for controlling or supervising vessel traffic or for protecting navigation and the marine environment. Such measures may include but are not limited to: reporting and operating requirements, surveillance and communications systems, routing systems, and fairways.
Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 401 et seq.)	U.S. Army Corps of Engineers	Section 10 (33 U.S.C. 403) delegates to the ACOE the authority to review and regulate certain structures and work that are located in or that affect navigable waters of the United States. The Outer Continental Shelf Lands Act extends the jurisdiction of the ACOE, under Section 10, to the seaward limit of Federal jurisdiction.
Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 et seq.)	Environmental Protection Agency	Requires waste generators to determine whether they generate hazardous waste and, if so, to determine how much hazardous waste they generate and notify the responsible regulatory agency. Requires hazardous waste treatment, storage, and disposal facilities (TSDFs) to demonstrate in their permit applications that design and operating standards established by the EPA (or an authorized State) will be met. Requires hazardous waste TSDFs to obtain permits.
National Historic Preservation Act of 1966, as amended (16 U.S.C. 470-470t); Archaeological and Historical Preservation Act of 1974 (16 U.S.C. 469-469c-2)	• National Park Service • Advisory Council on Historic Preservation • State or Tribal Historic Preservation Officer	Requires each Federal agency to consult with the Advisory Council on Historic Preservation and the State or Tribal Historic Preservation Officer before allowing a Federally licensed activity to proceed in an area where cultural or historic resources might be located; authorizes the Interior Secretary to undertake the salvage of archaeological data that may be lost due to a Federal project.

Statute/Executive Order	Responsible Federal Agency/ Agencies	Summary of Pertinent Provisions
American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996); Executive Order 13007, "Indian Sacred Sites" (May 24, 1996)	• National Park Service • Advisory Council on Historic Preservation • State or Tribal Historic Preservation Officer	Requires Federal agencies to facilitate Native American access to and ceremonial use of sacred sites on Federal lands, to promote greater protection for the physical integrity of such sites, and to maintain the confidentiality of such sites, where appropriate.
Federal Aviation Act of 1958 (49 U.S.C. 44718); 14 CFR part 77	Federal Aviation Administration	Requires that, when construction, alteration, establishment, or expansion of a structure is proposed, adequate public notice be given to the FAA as necessary to promote safety in air commerce and the efficient use and preservation of the navigable airspace.
Federal Powers Act (16 U.S.C 792-823a)	Federal Energy Regulatory Commission	While BOEMRE will issue leases, easement and right-of-way for hydrokinetic projects located on the OCS, FERC will issue licenses for the construction and operation of hydrokinetic projects on the OCS.

7.6 Appendix 6
Principles of the BLM's Visual Resource Management

Pre-Planning Visual Resource Inventory

Visual values are documented and analyzed through the objective and systematic visual resource inventory (VRI) process, which documents scenic quality, public levels of sensitivity, and visibility. Data is collected for each of the three inventoried values and entered into a geodatabase for mapping and thoughtful planning analysis. Scenic quality, sensitivity, and visibility are mapped and layered in order to classify the landscape based on the combined product of these three measured values.

The inventoried visual values are informational only and used for decisionmaking during the resource/forest management planning process. They are used to quantify and disclose impacts and weigh loss of scenic values due to other higher priority resource uses during land use planning and National Environmental Policy Act (NEPA) processes.

Visual Resource Management (VRM) and Resource Management Plans (RMP)

The results of VRI become an important component of resource or forest management plans for a given area. The RMP establishes how the public lands will be used and allocated for different purposes, and it is developed through public participation and collaboration. Visual values are considered throughout the RMP process, and the area's visual resources are then assigned to VRM Classes with established objectives.

The VRM Class designations are considered a land use plan decision that guides future land management actions and subsequent site-specific implementation decisions. The VRM Classes have delineated boundaries by which the surface is managed in accordance with respective class objectives. VRM Classes range from I to IV, with VRM Class I being the most restrictive on visible landscape modification and VRM Class IV allowing for major visible landscape modification. Relationships between energy activities and VRM Class objectives are evaluated for compatibility providing the opportunity for protecting visual resources while allowing for sustainable levels of energy resource development activity.

VRM Implementation and Evaluation of Land Use Projects/Activities

The approved VRM management class objectives impart visual management standards for the design and development of future projects and rehabilitation guidelines for existing projects. Energy proponents are encouraged to factor visual management objectives into the early phases of project planning and incorporate visual design principles into all surface disturbing site development plans to meet the VRM Class requirements.

The VRM mitigation strategies are developed through thoughtful use of visual design tools and expertise to minimize visual impacts associated with a proposed activity or project. As design develops, project plans are evaluated for ways and means of reducing contrast through applying a range of best management practices for mitigating visual impacts.

The overall VRM goal is to minimize visual impacts, beginning with thoughtful project siting. Different types of energy resources have variable siting constraints that affect the efficiency of energy generation. The Bureau of Land Management (BLM) continues to reinforce the concepts of strategic location selection in less visible and less sensitive areas, minimizing disturbance, and

repetition of the basic elements (form, line, color, and texture).

Three design fundamentals can be used for all forms of activity or development, regardless of the resource value being addressed. Applying these fundamentals will help solve most visual design problems:

1) Proper Siting or Location - Siting and selecting the proper location for a proposed project is the most effective design technique and normally yields the most dramatic results. Basic principles include distancing a project away from viewing receptors. The further into the background, the lesser the contrast. Avoid locating facilities near prominent natural topographic features that already attract attention. Design the shape and placement of projects to blend with topographic forms and existing vegetation patterns. Use topographic features and vegetation to screen all or a portion of the proposed development.

2) Reducing Unnecessary Disturbance - As a general rule, reducing the amount of land disturbed during the construction of a project reduces the extent of visual impact. Techniques that help reduce surface disturbance include: collocating or concentrating projects; undergrounding utilities along side or under the surface of an existing road; establishing limits of construction disturbance; maximizing slope when it is aesthetically and technically appropriate; locating construction staging and administrative areas in less visually sensitive areas; and requiring restoration of disturbed areas after construction has been completed.

3) Repeating the Elements of Form, Line, Color, and Texture - Every landscape has the basic elements of form, line, color, and texture. Repeating these elements reduces contrasts between the landscape and the proposed activity or development and results in less visual impact. The BLM evaluates the project's design effectiveness of using the existing landforms, vegetation patterns, and natural lines in the landscape to reinforce the design of the proposed activity or development. By imitating these naturally occurring elements, the design of the proposed development will be in closer harmony with the natural landscape.

This is an untreated cellular tower viewed from Arches National Park.

This is the same cellular tower after color treatment.

Minimizing disturbance, placement of facilities, utilizing landform, and surface reclamation

Improper placement of turbines and roads lead to a large visual footprint and environmental damage.

This location shows how topography can partially conceal wind turbines and reduce visual dominance.

Improper surface management creates a greater level of visual contrast with natural landscape line, color, and texture.

Preservation of vegetation under transmission lines eliminates visual contrast and minimizes an otherwise visually dominant structure.

Vegetation manipulation can reduce visual dominance created by contrast in line, color, and texture while also mitigating for other resource management challenges (fire fuel reduction, wildlife habitat enhancement, etc.).

The fundamentals and strategies are all interrelated and, when used together, can help resolve visual impacts from proposed activities or developments. The techniques presented here are only a portion of the many design techniques available to help reduce the visual impacts resulting from surface-disturbing activities or projects.

The BLM's visual resource contrast rating process outlines procedures for evaluating a project's compliance with the VRM. Visual contrast rating procedures are defined with the BLM Handbook H-8431-1, Visual Resource Contrast Rating, for evaluating the level of contrast anticipated between a proposed development and the natural setting. Visual contrast level is determined through analysis of the project's form, line, color, and texture and how they interrupt or complement the form, line, color, and texture of the natural landscape setting.

VRM Training

The BLM provides VRM training to all BLM employees, other Federal agencies and contractors, and industry proponents and consultants.

VRM and Renewable Energy Initiatives

Visual Risk Assessment Process - The BLM is working with the Argonne National Laboratory on developing a refined geographical information system (GIS)-based system for (1) developing visual impact risk maps for areas under consideration for wind energy development and (2) identifying location-specific visual impact mitigation measures and best management practices to avoid or reduce potential visual impacts associated with wind energy development. This is funded by the U.S. Department of Energy's (DOE) grant program titled 20% Wind by 2030: Overcoming the Challenges. BLM offices involved with this effort include the BLM Washington Office, BLM National Operations Center, and the BLM Wyoming Renewable Energy Coordination Office.

Several renewable energy initiatives that incorporate VRM are funded through the American Recovery and Reinvestment Act. These initiatives contribute to employment opportunities for BLM and/or DOE contractors and include the following:

- The BLM National Operations Center hired a visual resources landscape architect lead to work directly with the field offices, BLM Renewable Energy Coordination Offices, and renewable energy proponents with minimizing visual impacts.

- The BLM is updating VRIs in areas with high solar energy potential including targeted field office areas in Arizona, California, Colorado, Nevada, New Mexico, and Utah. The inventory will be used to evaluate the visual suitability of site locations for concentrated solar energy development analyzed as a part of the solar programmatic environmental impact statement and planning, design, and visual impact analysis of individual solar energy projects.

- Staff members utilizing the BLM's VRM program and the National Landscape Conservation System's National Scenic and Historic Trails program are collaborating to develop guidance for establishing and inventorying the extent of visual settings associated with scenic and historic trails. The guidance includes evaluation procedures for visual impacts from renewable energy and other forms of development.

- The BLM and Argonne National Laboratory are collaborating on a field study to systematically evaluate visibility and visual impact

threshold distances for modern utility-scale wind, solar, and geothermal energy development and electric transmission facilities on lands in the western United States. The study will examine the visual effects associated with these developments in a variety of seasonal, weather, and lighting conditions. The study should yield substantially improved baseline values for visual impact threshold distances that will benefit visual impact assessments for proposed renewable energy developments on Federal lands.

- The BLM is collaborating with the Federal Aviation Administration (FAA) on visibility requirements for obstacles that rise more than 200 vertical feet and present a risk for low-flying aircraft. To warn pilots, the FAA requires the obstacles to have continuous flashing lights during dark hours. The BLM and FAA are researching and evaluating the application of on-demand audio/visual warning systems technology as an alternative means to warn aircraft pilots of potential risk. The objective is to find acceptable alternatives that will help preserve night sky integrity in rural landscape settings. This technology may also lead to opportunities for mitigating the visibility of obstacles during light hours as well.

- The BLM Washington Office is collaborating with the BLM Wyoming Renewable Energy Coordination Office in researching the application of advanced camouflage technology to mitigate the visibility of renewable energy facilities. Each form of renewable energy has different common facilities and structures, such as wind turbines for wind energy. The camouflage technology might not have practical application for each renewable energy structure, but preliminary investigation indicates that this technology will prove effective to many ancillary structures and facilities.

- The BLM Washington Office is collaborating with the BLM Wyoming Renewable Energy Coordination Office on the publication titled Visual Resource Design and Best Management Practice Guidelines for Renewable Energy Development. The guidelines will draw from known global successes in mitigating visual issues as well as from the current BLM research projects described above.

8.0 Acronyms Used in This Report

ACEC	area of critical environmental concern
ACOE	Army Corps of Engineers
APD	application for permit to drill
ARRA	American Recovery and Reinvestment Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
BOR	Bureau of Reclamation
CFR	Code of Federal Regulations
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
EDIN	Energy Development in Island Nations
EIS	environmtal impact statement
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FWS	Fish and Wildlife Service
FY	fiscal year
GIS	geographical information system
GW	gigawatt
kWh	kilowatt hour
LOPP	lease of power privilege
MMS	Minerals Management Service
MOU	memorandum of understanding
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NLCS	National Landscape Conservation System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System

NPS	National Park Service
NREL	National Renewable Energy Laboratory
OCRM	Office of Ocean and Coastal Resource Management
OCS	Outer Continental Shelf
OIA	Office of Insular Affairs
OSM	Office of Surface Mining Reclamation and Enforcement
PEIS	programmatic environmental impact statement
PSD	prevention of significant deterioration
REAT	renewable energy action team
RECO	renewable energy coordination office
RMP	Resource Management Plan
SDZ	solar demonstration zone
SMCRA	Surface Mining Control and Reclamation Act of 1977
SMS	Scenery Management System
SRMA	special recreation management area
TCF	trillion cubic feet
TEPAC	Tribal Energy Policy Advisory Committee
TSDF	treatment, storage, and disposal facility
U.S.C.	United States Code
USCG	U.S. Coast Guard
USDA	Department of Agriculture
USFS	Forest Service
USGS	U.S. Geological Survey
VRI	Visual Resource Inventory
VRM	Visual Resource Management