

**GAO**

Report to the Ranking Member,  
Committee on Natural Resources,  
House of Representatives

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January 2013

# RENEWABLE ENERGY

## Agencies Have Taken Steps Aimed at Improving the Permitting Process for Development on Federal Lands



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Highlights of [GAO-13-189](#), a report to the Ranking Member, Committee on Natural Resources, House of Representatives

## Why GAO Did This Study

Concerns over reliance on imported oil and greenhouse gas emissions from fossil fuel use have led to increased interest in producing electricity from renewable sources, including wind, solar, and geothermal energy. Because federal lands, including those managed by the Departments of Agriculture and the Interior, encompass areas with high renewable energy potential, interest has increased in permitting such activity on those lands. EAct 2005 includes several provisions intended to increase renewable energy development on federal lands, including goals for approving renewable energy projects. GAO was asked to look at (1) the status of renewable energy permitting on federal land, including time frames for processing permits applied for since EAct 2005; (2) actions federal land management agencies have taken to facilitate renewable energy development on federal land, particularly since the passage of EAct 2005; and (3) factors affecting renewable energy development on federal land. To conduct this work, GAO reviewed laws, regulations, and policies; interviewed agency and industry officials; and surveyed BLM staff responsible for processing applications for renewable energy permits on federal lands.

GAO is not making any recommendations in this report. In commenting on a draft of this report, the Department of Agriculture concurred with its findings, while the Departments of Energy and the Interior had no comments.

View [GAO-13-189](#). For more information, contact Anne-Marie Fennell at (202) 512-3841 or [fennella@gao.gov](mailto:fennella@gao.gov).

January 2013

## RENEWABLE ENERGY

### Agencies Have Taken Steps Aimed at Improving the Permitting Process for Development on Federal Lands

## What GAO Found

Since passage of the Energy Policy Act of 2005 (EAct 2005), federal land management agencies—primarily the Department of the Interior’s Bureau of Land Management (BLM)—have received hundreds of applications for utility-scale renewable energy projects and authorized 25 projects: 7 wind, 10 solar, and 8 geothermal projects. Applications for the majority of projects were withdrawn by the applicants or denied by BLM because of insufficient information. Applications for about one-fourth of the projects are still pending with the agencies. Time frames for permitting wind and solar projects ranged from 1.5 to 4 years from receipt of the initial application to approval of the project, with time frames decreasing for applications submitted in later years. For geothermal projects, permitting time frames ranged from 1 to 4 years from receipt of the initial application to approval for construction. In all, for projects applied for since EAct 2005, BLM has authorized projects with the capacity to generate a total of about 5,450 megawatts of electricity, contributing to the act’s goal of approving projects capable of generating 10,000 megawatts of electricity on public lands by 2015.

Federal land management agencies have taken several steps to foster renewable energy development on federal lands since EAct 2005. Specifically, these agencies have developed or revised policies aimed at, among other things, improving the renewable energy permitting process, formalized coordination within and across agencies and with state and local governments, and devoted increased resources to processing applications for renewable energy permits. One of BLM’s most comprehensive actions was the completion of programmatic environmental impact statements for renewable energy development, intended to streamline the permitting process. The agencies also took steps to improve coordination through regularly established meetings and development of memorandums of understanding between federal and state agencies. They also added staff and increased funding for this development. For example, BLM tripled its staff devoted to processing wind and solar energy applications. To help ensure that its actions are achieving their intended purposes, BLM issued an instruction memorandum in December 2012 aimed at increasing the efficiency and effectiveness of its renewable energy permitting process.

According to BLM respondents to a GAO questionnaire, industry representatives, and others GAO interviewed, many factors affect the pace of renewable energy development on federal lands. Some of these factors are specifically tied to the agencies’ permitting processes, primarily BLM’s. For example, respondents cited effective coordination among the involved parties and the amount of resources the agency can devote to permitting as factors that facilitated the permitting process. On the other hand, they often cited problems with the quality of applications received as a factor that may hinder or slow the permitting process. Respondents also cited a number of factors outside of permitting agencies’ control that can affect the pace of renewable energy development, such as access to transmission lines (which are often scarce in areas where renewable energy is abundant) and competition from electricity generated using conventional energy sources, such as natural gas.

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## Abbreviations

BLM	Bureau of Land Management
EPOA 2005	Energy Policy Act of 2005
NEPA	National Environmental Policy Act

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United States Government Accountability Office  
Washington, DC 20548

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January 18, 2013

The Honorable Edward J. Markey  
Ranking Member  
Committee on Natural Resources  
House of Representatives

Dear Mr. Markey:

American families and businesses depend on electricity to power their lives, businesses, and the economy. Concerns over reliance on imported oil and greenhouse gas emissions from burning fossil fuels to generate power have increased interest in producing electricity from renewable sources, including wind, solar, and geothermal energy. In the coming decades, the Energy Information Administration in the Department of Energy projects the strongest growth in the domestic energy sector will come from renewable energy. The federal government is uniquely positioned to affect the development of renewable energy sources, in part through its land management activities. For example, the Department of the Interior's Bureau of Land Management (BLM) manages approximately 248 million surface acres, or about one-eighth of all lands in the United States, and estimates that 20.6 million acres have commercial wind energy generation potential and more than 20 million acres have commercial solar energy generation potential.

About 95 percent of federal land is managed by four land management agencies—BLM, the Fish and Wildlife Service, and the National Park Service in the Department of the Interior and the Forest Service in the Department of Agriculture. The agencies manage this land for various purposes. BLM and the Forest Service manage land for multiple uses, such as recreation, timber, and fish and wildlife, and have much of the responsibility for permitting renewable energy development on federal lands. In contrast, the Fish and Wildlife Service and the National Park Service manage land primarily to conserve fish and wildlife and their habitats and park resources, respectively.

Because areas of federal land have a high potential for producing renewable energy, interest has increased in permitting such production on those lands over the past decade. For example, through the Energy Policy Act of 2005 (EPA 2005), Congress directed the Secretary of the Interior to “seek to have approved non-hydropower renewable energy projects located on public lands with a generation capacity of at least

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10,000 megawatts of electricity” by 2015.<sup>1</sup> In 2009 the Secretary issued an order establishing renewable energy as a priority for the department and also establishing a task force to, among other tasks, develop a strategy to increase the development and transmission of renewable energy from appropriate areas on public lands.<sup>2</sup>

Although renewable energy is generally cleaner to produce than energy from conventional sources, such as coal- or gas-fired power plants, renewable energy projects can have significant environmental impacts. Developing renewable energy projects on a scale large enough to generate substantial electric power (i.e., on a utility scale) can affect the environment across hundreds, even thousands, of acres of federal land and, depending on the energy source, may preclude uses of those acres for other purposes. In addition, these projects, like other development projects, can affect the surrounding environment: for example, water used in some solar technologies may diminish scarce groundwater in the arid Southwest, or the turning rotors of a wind turbine may kill birds and bats. Accordingly, part of the federal permitting process for renewable energy development on BLM- and Forest Service-managed lands involves not only those agencies but also the Fish and Wildlife Service and National Park Service in assessing potential environmental effects.

In light of interest in renewable energy development on federal land, you asked us to review federal agencies’ processes and time frames for permitting renewable energy projects. Our objectives were to examine (1) the status of renewable energy permitting on federal land, including time frames for processing permits applied for since EPOA 2005; (2) actions the agencies have taken to facilitate renewable energy development on federal land, particularly since the passage of EPOA 2005; and (3) factors affecting renewable energy development on federal land.

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<sup>1</sup>Pub. L No. 109-58, § 211, 119 Stat. 660 (2005). The act specifically omitted hydropower as a part of the 10,000-megawatt goal. A megawatt is 1 million watts, or enough electricity to power about 750 homes.

<sup>2</sup>For this report, we are defining renewable energy to include onshore wind, solar, and geothermal energy. Likewise, we are limiting our discussion of federal lands to those lands managed for multiple uses by the Department of the Interior and the Department of Agriculture. Other lands, such as those managed by the Department of Defense, are excluded from our analysis because they are generally not open to outside development of renewable energy resources.

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To determine the status of renewable energy permitting, we administered a questionnaire to BLM officials nationwide, covering all permit applications for onshore wind, solar, and geothermal energy projects submitted to BLM—the agency responsible for permitting almost all applications submitted for renewable energy development on federal lands—from enactment of EPOA 2005 (August 8, 2005) through May 2012. We analyzed information obtained through the questionnaire regarding the status and time frames associated with each application and the factors affecting its processing. We received a 100 percent response rate to this questionnaire. In addition, we conducted semistructured interviews with officials in the nine Forest Service regional offices to determine the status and time frames of renewable energy permitting on Forest Service-managed lands. To determine actions taken to facilitate renewable energy development, we reviewed relevant laws, regulations, and agency policies and guidance. We interviewed headquarters officials from the Department of the Interior and its four land management agencies—BLM, the Bureau of Indian Affairs, the Fish and Wildlife Service, and the National Park Service—as well as from the Department of Agriculture’s Forest Service. We also interviewed BLM officials from four state offices;<sup>3</sup> Fish and Wildlife Service and National Park Service officials from selected regions and field units;<sup>4</sup> officials from all nine Forest Service regions; and officials in the wind, solar, and geothermal research programs at the Department of Energy’s National Renewable Energy Laboratory in Golden, Colorado. We obtained BLM funding and staffing data from the agency’s database, and we assessed the reliability of these data by reviewing the agencies’ internal controls of their data systems and interviewing agency officials; we found these data to be sufficiently reliable for the purposes of this report. To determine factors affecting renewable energy development, we used the results of our questionnaire and also interviewed representatives from industry and environmental groups to obtain their perspectives on the time frames and

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<sup>3</sup>We interviewed BLM officials from California, Colorado, Nevada, and Wyoming. We selected California, Nevada, and Wyoming primarily because they represent areas with substantial renewable energy development and substantial agency resources devoted to processing renewable energy applications. We selected Colorado primarily to obtain perspectives about the program from a state with less activity and fewer resources.

<sup>4</sup>We interviewed Fish and Wildlife Service officials from the agency’s Mountain-Prairie and Pacific Southwest Regions, both selected because they had a significant amount of renewable energy development, and from one state office within each of these regions. We interviewed a National Park Service official from a national park in California because of his experience with renewable energy development near the park.

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factors associated with the permitting process, and renewable energy development in general. Appendix I provides a more detailed description of our scope and methodology.

We conducted this performance audit from January 2012 to January 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

Renewable energy technologies generate electricity, fuels, or heat through the use of resources that are continually replenished, such as wind, sunlight, and naturally occurring underground steam and heat.<sup>5</sup> Development of utility-scale renewable energy projects on federal land occurs primarily on lands managed by BLM and, to a lesser extent, on those managed by the Forest Service. Nearly all of the approximately 248 million surface acres of federal land managed by BLM are located in 11 western states and Alaska. BLM is also responsible for managing resources (e.g., geothermal, oil, and gas resources) lying on or beneath federal lands and beneath private lands for which the federal government retains mineral rights—amounting to approximately 700 million subsurface acres altogether. The Forest Service is responsible for managing 193 million acres of forests and grasslands, primarily in the western states but also throughout the country. The Fish and Wildlife Service and National Park Service manage about 90 million and 80 million acres, respectively, but under legislation that generally

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<sup>5</sup>Other renewable energy sources include bioenergy, such as liquid biofuels and solid biomass fuel; hydropower; ocean energy, including wave, tidal, current, and ocean thermal energy; and waste conversion, including anaerobic digestion, landfill gas, and municipal solid waste.

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precludes the development of large-scale renewable energy projects.<sup>6</sup> Another Interior agency, the Bureau of Indian Affairs, works with Indian tribes to develop renewable energy on tribal lands.<sup>7</sup>

Renewable energy projects on federal lands date back decades; for example, utility-scale geothermal projects have operated on both BLM- and Forest Service-managed lands since the 1970s, and several utility-scale wind projects have been operating on BLM-managed lands, primarily in California, since the early 1980s.<sup>8</sup> In May 2012, the first utility-scale solar power plant began operating on federal lands, specifically on BLM-managed land. No utility-scale wind or solar development is operating at present on Forest Service-managed lands. In general, over half the nation's electricity generated from geothermal resources comes from resources on federal lands, and about 1 percent of the nation's electricity generated from wind and solar energy comes from resources on federal lands.

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## Types of Renewable Energy and Technologies Used for Development

Electricity generation using wind, solar, and geothermal energy can range from small-scale production—for example, rooftop solar panels on a home or geothermal resources heating a greenhouse—to utility-scale production of hundreds of megawatts of electricity. Figure 1 shows

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<sup>6</sup>The National Wildlife Refuge System Improvement Act of 1997 directs the Fish and Wildlife Service to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations. The act requires the Fish and Wildlife Service to determine the compatibility of activities with the purposes of a particular refuge and the mission of the refuge system and not allow those activities deemed incompatible. The National Park Service Organic Act of 1916 created the National Park Service to promote and regulate the use of the National Park System with the purpose of preserving unimpaired the natural and cultural resources of park units for the enjoyment of this and future generations.

<sup>7</sup>The Bureau of Indian Affairs is responsible for the administration and management of 55 million surface acres held in trust by the United States for Indian tribes, individuals, and Alaska Natives. Permitting renewable energy projects on tribal trust lands is project dependent and handled by a combination of the tribal surface owner, the bureau, BLM, and other agencies.

<sup>8</sup>Electricity generated from federal lands helps power millions of homes across the United States. For example, the geothermal resources found at the Geysers Geothermal Field—approximately 40 percent of which are considered to come from federal lands—has a net generating capacity sufficient to power 750,000 homes, or a city the size of San Francisco.

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examples of utility-scale facilities representing each of these three energy types.

**Figure 1: Examples of Utility-Scale Wind, Solar, and Geothermal Technologies**



Source: U.S. Department of Energy.

The most common technologies for utility-scale wind, solar, and geothermal development include the following:

- *Wind energy.* Wind farms comprise a number of turbines built close together to produce utility-scale wind power. Horizontal-axis turbines, the most common, constitute nearly all utility-scale turbines in the United States.<sup>9</sup> To generate electricity, horizontal-axis turbines capture the wind's energy with two or three propellerlike blades mounted on a rotor sitting atop a tower. A smaller utility-scale wind farm may have 6 turbines on 100 acres and generate about 3 megawatts, and a larger wind farm may have over 100 turbines on about 10,000 acres and generate over 300 megawatts. Siting wind farms in appropriate locations is important because they can fragment wildlife habitat and plant communities, and the turbines and blades themselves may kill birds and bats, make noise, and mar views.
- *Solar energy.* Multiple technologies exist for utility-scale solar power. Solar photovoltaic technologies convert energy from sunlight directly into electricity, using arrays of solar panels. Concentrating solar power technologies use mirrors to focus the sun's energy to heat water or other fluids; these fluids in turn create steam that powers a conventional turbine generator to produce electricity. An average solar

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<sup>9</sup>The other type of wind turbine is a vertical-axis turbine, which resembles an eggbeater.

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plant, whether photovoltaic or concentrating, requires about 3 to 8 acres for every megawatt of generating capacity. For example, a small utility-scale solar plant occupying about 400 acres may generate 45 megawatts, and a large facility occupying over 7,000 acres may generate 1,000 megawatts. Selecting appropriate areas for the development of solar projects is essential given that such development generally precludes other uses of the same land because the surface area is graded before installation, and components are installed relatively close to one another. In the southwestern United States, where the potential for solar energy development is greatest, solar installations can affect habitat needed by various species, including those listed as threatened or endangered under the Endangered Species Act, such as the desert tortoise. In addition, some solar technologies use large amounts of water, which can be problematic in desert environments.

- *Geothermal energy.* Geothermal power plants extract geothermal fluids—hot water, brines, and steam—from the earth by drilling wells to depths of up to 10,000 feet.<sup>10</sup> These fluids are then used to create a vapor that can power a turbine generator to produce electricity, with only the highest-temperature geothermal resources—generally above 200 degrees Fahrenheit—suitable for electricity generation. Geothermal power plants typically generate from 30 to 120 megawatts, and an individual power plant often uses resources brought to the surface through multiple wells. Mitigating for harmful effects is important in geothermal planning because geothermal operations can emit dangerous gases, and geothermal drilling operations may contaminate groundwater.

However it is generated, electricity from utility-scale renewable energy development is sold to utilities and—like electricity generated by more conventional sources such as coal- or gas-fired power plants—is conveyed to consumers through transmission lines. Some of the best locations for wind and solar development, however, are in remote areas far from consumers, and transmission lines to carry the power are not

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<sup>10</sup>In addition, a technology referred to as “enhanced geothermal systems,” being developed by the Department of Energy and others, has the potential to allow for the use of geothermal resources not previously obtainable. This technology works by injecting high-pressure fluids into geologic formations where there is hot rock but little natural permeability for hot water to circulate; these fluids fracture the rock and thereby create more permeable formations, enhancing the availability of geothermal resources.

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always readily available in these remote areas. In addition, electricity generated from wind and solar development differs from geothermal and conventional sources because it is available intermittently, rather than continuously.

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## Agency Permitting Processes for Renewable Energy Development

In managing their lands, BLM and the Forest Service are required by the Federal Land Policy and Management Act of 1976 and the National Forest Management Act, respectively, to develop or revise land use plans for the areas they manage, providing for multiple uses, such as recreation, timber, and fish and wildlife, and natural scenic, scientific, and historical values. All land management actions, including renewable energy development, must conform to the approved land use plan governing the land management unit—such as a national forest—where the action is to take place. Consequently, renewable energy development can occur only where it is consistent with the applicable land use plan, which in some cases may require changing the plan. Plan revisions undergo extensive environmental analysis before being finalized.

Wind and solar energy projects on federal land require permits from the relevant land management agency through the issuance of rights-of-way.<sup>11</sup> A right-of-way is an authorization to a qualified individual, business, or government entity to use a specific area of federal land for a specific amount of time for a certain purpose and with certain restrictions. Geothermal activities are administered by BLM for all federal lands (regardless of whether the surface land is managed by BLM or another agency) through the issuance first of leases and then of subsequent permits for drilling operations and other activities—similar to the process used for oil and natural gas.<sup>12</sup>

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<sup>11</sup>Stakeholders have characterized authorizations for wind and solar energy development as “permits,” “rights of way,” “right-of-way leases,” and “leases.” In this report, we use the statutory term “right-of-way” to refer to these authorizations. The Forest Service implements this authority by issuing special use permits.

<sup>12</sup>The Mineral Leasing Act of 1920, as amended, and the Mineral Leasing Act for Acquired Lands of 1947, as amended, provide the legislative authority for federal oil and gas leasing. BLM’s oil and gas leasing regulations are located at 43 C.F.R. pt. 3120, and regulations governing oil and gas operations are located at 43 C.F.R. pt. 3160. BLM cannot issue leases for National Forest System lands over the objection of the Forest Service.

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## Permitting for Wind and Solar Energy Development

The Federal Land Policy and Management Act of 1976 authorizes BLM and the Forest Service to issue rights-of-way over federal lands for a variety of purposes, including systems for generating, transmitting, and distributing electric energy.<sup>13</sup> For new projects that may have a significant impact on the environment, the act requires applicants to submit a plan of construction, operation, and rehabilitation for the right-of-way that complies with applicable laws and regulations. An agency may issue a right-of-way only after the applicant has demonstrated that it has the technical and financial capability to construct the project for which the right-of-way is requested. Each right-of-way must include terms and conditions that, among others, protect the environment, federal property and economic interests, and the public interest. The holder of a right-of-way must generally pay its fair market value annually in advance and must provide a bond ensuring that the holder can perform the obligations—such as reclamation—required by the terms of the right-of-way.

BLM's permitting process for wind or solar energy projects comprises several steps prior to right-of-way issuance, as follows:

- A potential project developer contacts the BLM office responsible for land where a right-of-way is sought and obtains a standard application form.
- Preapplication meetings take place between the potential applicant and appropriate BLM field office staff to discuss the application form and its requirements, the general project proposal, land use planning in the area, and potential land use constraints.
- Once an application has been submitted, BLM reviews it to determine whether it is complete. A complete application must include a statement of technical and financial capability to construct, operate, maintain, and terminate the system for which the right-of-way is being requested, along with a project description—called a plan of development—sufficiently detailed for BLM to evaluate the proposed project's appropriateness and feasibility.<sup>14</sup>

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<sup>13</sup>BLM may issue a right-of-way on a given land area unless otherwise directed by law, agency order, or a land use plan. 43 C.F.R. § 2802.10.

<sup>14</sup>BLM's website offers proponents a template to be used in developing wind and solar plans of development.

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- BLM checks to ensure that the proposed use conforms with BLM land use plans and that no apparent conflicts exist, such as other valid rights for the same lands requested in the application.
  - BLM establishes a cost-recovery fee based on the amount of time BLM estimates it will take to process the application and issue a decision and collects this fee from the applicant.<sup>15</sup>
  - BLM begins processing and evaluating the application, including associated environmental reviews under the National Environmental Policy Act (NEPA),<sup>16</sup> Endangered Species Act, and others.

An approved application generally results in an authorized right-of-way, although BLM generally issues a notice to proceed before the holder of the right-of-way can begin construction. On the other hand, BLM is authorized to deny applications for various reasons—for example, if the project is not consistent with the relevant land use plan or if applicants do not provide BLM with sufficient information.<sup>17</sup> At any point in the process, an applicant may choose to withdraw the application.

The Forest Service issues permits for wind and solar energy development under its “special use” permit process.<sup>18</sup> A potential project developer files a project proposal, which must contain information such as a project description and evidence of the applicant’s technical and financial capability to carry out the project. Proposals are initially screened to ensure in part that the proposed project is consistent with applicable laws, regulations, and relevant land use plans. A second screening then examines whether the applicant has demonstrated sufficient technological

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<sup>15</sup>The Federal Land Policy and Management Act authorizes BLM to recover the costs of processing right-of-way permit applications. Such cost-recovery fees are estimated by BLM and can be paid in installments, depending on the actual amount necessary to process an application.

<sup>16</sup>Pub. L. No. 91-190, 83 Stat. 852 (1970), codified as amended at 42 U.S.C. §§ 4321-4347 (2011). Under NEPA, federal agencies must assess the effects of major federal actions—those they propose to carry out or to permit—that significantly affect the environment.

<sup>17</sup>A BLM decision to deny an application must be made in writing, stating the reason(s) for denial. Reasons for denial are described at 43 C.F.R. §2804.26.

<sup>18</sup>Special use authorization regulations appear in 36 C.F.R. pt. 251, subpart B. All uses of Forest Service lands other than those involving roads, grazing and livestock use, the sale and disposal of timber and certain other forest products, and minerals are designated as special uses.

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## Permitting for Geothermal Energy Development

and financial capability. If these conditions are met, the potential project developer may submit the proposal as a formal application, which is then analyzed under NEPA. If the project is approved, a special use permit is awarded to the applicant. Special use permits must include terms and conditions that protect the environment and require compliance with federal and state air and water quality laws, as well as with any state environmental and facility siting standards that are more stringent than federal standards. Like BLM, the Forest Service can deny applications for various reasons, including if the proposed project is inconsistent with the relevant land use plan or if the applicant fails to demonstrate sufficient technical or financial capability.

Geothermal activities are authorized through the issuance of leases and several subsequent permits and approvals to drill fluid minerals under the Geothermal Steam Act of 1970, as amended. To explore and develop geothermal resources on federal lands, developers generally must first obtain a federal lease from BLM.<sup>19</sup> Once a lease is obtained, a potential developer undergoes three primary phases seeking approval of plans and permits to explore and then develop geothermal resources and, ultimately, to construct a geothermal power plant. These plans and permits include the following: (1) an exploration plan, which describes the overall process for drilling and testing for geothermal resources; (2) one or more geothermal drilling permits, which allow an applicant to drill wells to confirm and produce geothermal resources at a given location; and (3) a utilization plan, which describes the proposed power plant and infrastructure needed to generate electricity from geothermal resources and provides much of the information needed to permit the power plant itself. A construction permit and site license must also be obtained before geothermal plant construction may begin. These three phases of geothermal permitting can be set in motion concurrently, but generally the environmental approval for the exploration phase is completed before applicants apply for geothermal drilling permits and subsequent construction permits. Applications for geothermal drilling permits can also be submitted after construction of a plant is completed if the developer determines that a geothermal field may benefit from additional wells.

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<sup>19</sup>Agency officials told us that limited exploration activities may take place before a lease is issued, although developers generally prefer to obtain a lease before making any substantial investments in exploration activities. The lease is a contract between the federal government and the lessee that specifies certain terms for development and payment of rents and royalties.

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## Key Environmental Laws Affecting the Permitting Process

As with many other land management activities, the agencies must comply with key environmental laws—including, among others, NEPA, the Endangered Species Act, and the National Historic Preservation Act—when amending land use plans and approving permits for renewable energy development. Compliance with these laws can involve considerable time spent by agencies and project developers on environmental analysis and consultation with multiple agencies.

- *National Environmental Policy Act of 1969.*<sup>20</sup> Enacted in 1970, NEPA has as its purpose, among others, to promote efforts to prevent or eliminate damage to the environment. NEPA requires an agency to prepare a detailed statement on the environmental impacts of any “major federal action” significantly affecting the environment. Regulations promulgated by the Council on Environmental Quality<sup>21</sup> implementing NEPA generally require an agency to prepare either an environmental assessment<sup>22</sup> or an environmental impact statement.<sup>23</sup> Agencies may prepare an environmental assessment to determine whether there is a significant potential impact on the environment, which would necessitate the preparation of an environmental impact statement. If the agency determines in its environmental assessment that no significant environmental impacts will occur from the proposed action, then it prepares a finding of no significant impact. If the agency issues an environmental impact statement, it must also issue a record

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<sup>20</sup>Pub. L. No. 91-190 (1970), codified at 42 U.S.C. §§ 4321-4347.

<sup>21</sup>The President’s Council on Environmental Quality coordinates federal environmental efforts and works with other White House offices and federal agencies in the development of environmental policies and initiatives.

<sup>22</sup>An environmental assessment is a concise public document that provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact and is to include brief discussions of the need for the proposal, alternatives, the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted. 40 C.F.R. § 1508.9 (2011).

<sup>23</sup>An environmental impact statement is a more detailed statement than an environmental assessment, and NEPA implementing regulations specify requirements and procedures—such as providing the public with an opportunity to comment on the draft document—applicable to the environmental impact statement process that are not mandated for environmental assessments. An environmental impact statement must, among other things, (1) describe the environment that will be affected, (2) identify alternatives to the proposed action and identify the agency’s preferred alternative, (3) present the environmental impacts of the proposed action and alternatives, and (4) identify any adverse environmental impacts that cannot be avoided should the proposed action be implemented. 42 U.S.C. § 4332(c) (2011), 40 C.F.R. §§ 1501.4, 1508.11 (2011).

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of decision describing the agency's decision; identifying all alternatives the agency considered; and stating whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted and, if not, why not. Environmental impact statements can be developed at either a programmatic level—where larger-scale, combined and cumulative effects can be evaluated and where overall management objectives, such as road access and use, are defined—or a project level, where the effects are evaluated of a particular project in a specific place at a particular time. Programmatic environmental impact statements can reduce the environmental analysis needed for individual projects proposed in the area covered by a programmatic statement.<sup>24</sup> In addition, land use plan revisions typically involve the preparation of an environmental impact statement, and programmatic statements have also enabled agencies to amend multiple land use plans at the same time (e.g., land use plans for areas served by multiple BLM field offices), thereby reducing the NEPA review typically required when unit-specific land use plans are amended.

- *Endangered Species Act of 1973.*<sup>25</sup> The purpose of the Endangered Species Act is to conserve threatened and endangered species and the ecosystems upon which they depend. Under section 7 of the act, federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a species protected under the act. To fulfill this responsibility, the agencies must, under some circumstances, formally consult with the Fish and Wildlife Service when their actions may affect listed species or habitat identified as critical to the species' survival. The consultation usually ends with the issuance of a biological opinion by the Fish and Wildlife Service; this opinion may specify protective measures intended to minimize the project's impact on the species. For example, on the basis of a biological opinion, BLM may require a wind project to incorporate techniques reducing the turbines' potential to harm species protected under the act.

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<sup>24</sup>A programmatic environmental impact statement does not typically replace the need for site-specific environmental review of each project, but the ability to use broader programmatic analyses can help streamline environmental review by focusing the analysis on the most critical site-specific issues of concern. Known as tiering, a programmatic approach allows an agency to avoid duplication of paperwork by incorporating by reference the general discussions and relevant specific discussions from an environmental impact statement of broader scope into one of lesser scope or vice versa.

<sup>25</sup>Pub. L. No. 93-205 (1973), codified as amended at 16 U.S.C. §§ 1531-1544.

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- *National Historic Preservation Act of 1966.*<sup>26</sup> The National Historic Preservation Act provides for the protection of historic properties. For all projects receiving federal funds or a federal permit, section 106 of the act requires federal agencies to take into account a project's effect on any historic property, including, for example, areas of traditional religious and cultural importance to an Indian tribe.<sup>27</sup> In accordance with regulations implementing the act, agencies must consult with relevant federal, state, and tribal officials to determine whether a project or activity has the potential to affect historic properties.

Other key federal laws affecting the permitting of renewable energy projects in particular include the Migratory Bird Treaty Act<sup>28</sup> and the Bald and Golden Eagle Protection Act.<sup>29</sup> Each act generally makes it unlawful to “take” (defined to include, among other actions, hunting, trapping, or killing) a bird, its nest, or eggs covered by the act unless a permit has been issued under specific circumstances.

In addition to federal land management agency requirements, project applications are also subject to relevant state and local requirements, which vary from state to state. For example, in California, utility-scale solar projects are also subject to the California Environmental Quality Act. The California act requires a state agency to prepare an environmental impact report on any project it proposes to carry out or approve that may have a significant effect on the environment. The act generally prohibits the agency from approving a project unless it is modified to mitigate or avoid significant effects on the environment.

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<sup>26</sup>Pub. L. No. 89-665 (1966), codified as amended at 16 U.S.C. §§ 470 to 470x-6.

<sup>27</sup>The act defines as a historic property any prehistoric or historic district, site, building, structure, object, or any properties of traditional religious and cultural importance to an Indian tribe, included or eligible for inclusion in the National Register of Historic Places.

<sup>28</sup>16 U.S.C. §§ 703-712.

<sup>29</sup>16 U.S.C.A. §§ 668- 668d.

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## BLM Has Received Hundreds of Permit Applications since EAct 2005 and Authorized 25 Projects

Since 2005, BLM has received hundreds of permit applications for utility-scale renewable energy projects. For wind and solar projects, 17 projects have been authorized, with permit-processing time frames decreasing over time—from about 4 years to about 1.5 years. For geothermal projects, 29 applications were submitted, and construction was approved for 8 projects, with the permit-processing time frames ranging from 1 to 4 years. In all, since EAct 2005, BLM has authorized projects sited on federal lands with the capacity to generate a total of about 5,450 megawatts of electricity, a substantial increase over the number of megawatts the agencies had authorized before passage of the act, contributing to the act's goal of approving 10,000 megawatts of renewable energy on federal lands by 2015.

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## Since 2005, BLM Received 416 Wind and Solar Permit Applications and Authorized 17 Projects, and Permitting Time Frames Have Decreased

According to agency officials and responses to our questionnaire, from passage of EAct 2005 through May 2012, BLM received 416 permit applications for utility-scale wind and solar projects. Over 350 of the applications were for solar energy projects, almost all of which were submitted for development on BLM-managed lands in Arizona, California, and Nevada. Sixty-five applications were submitted to BLM for wind energy projects. One application was submitted for a wind energy project on Forest Service-managed land.<sup>30</sup> Of the 416 applications submitted to BLM, rights-of-way were issued for 20 applications covering 17 projects (7 wind and 10 solar).<sup>31</sup> About 60 percent of the applications were

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<sup>30</sup>The one wind development application to the Forest Service since EAct 2005 was accepted in August 2008 for development in the Huron-Manistee National Forests in Michigan. In 2010, however, before the Forest Service determined whether to approve or deny the permit, the applicant withdrew the application. Since EAct 2005, additional applications may have been submitted to the Forest Service, but the Forest Service maintains data only for those applications that complete the agency's screening process and are determined sufficiently complete to analyze. This practice differs from that of BLM, which tracks all applications, whether or not they are complete enough to analyze. Separately, the Forest Service has approved one other application for a wind project to be developed on the lands it manages. This project, located in Green Mountain National Forest in Vermont, was approved in January 2012, although construction for the project had not yet begun as of the time of this report. Because the application was submitted before EAct 2005, this project is not included in our analysis.

<sup>31</sup>In some cases, multiple applications may be submitted and approved for one project. For example, at one solar project in California, the applicant submitted four applications to address the component land areas of a single project. For geothermal energy development, multiple applications are submitted for each project, covering the three phases of geothermal development—exploration, drilling, and construction.

ultimately withdrawn by the applicant or denied by BLM. Table 1 depicts the status of all 416 wind and solar applications. (See also app. I for more information about our methodology for determining how many applications each agency received.)

**Table 1: Status of Applications for Utility-Scale Wind and Solar Project Permits on BLM-Managed Lands since EAct 2005**

Status of applications	Wind applications		Solar applications		Total wind and solar applications	
	Number	Percentage	Number	Percentage	Number	Percentage
Authorized	7	11	13 <sup>a</sup>	4	20	5
Pending	27	42	82	23	109	26
Withdrawn	17	26	126	36	143	34
Denied	13	20	97	28	110	26
On hold <sup>b</sup>	<sup>c</sup>	<sup>c</sup>	11	3	11	3
Other <sup>d</sup>	1	2	22	6	23	6
<b>Total</b>	<b>65</b>	<b>100</b>	<b>351</b>	<b>100</b>	<b>416</b>	<b>100</b>

Source: GAO analysis of BLM questionnaire results. Because of rounding rules, percentages for some results shown in the table may not add to 100.

<sup>a</sup>A right-of-way was authorized for 13 solar applications; however, these 13 applications covered 10 projects because 1 project had multiple applications.

<sup>b</sup>“On hold” refers to certain solar energy applications for which BLM postponed processing while the solar programmatic environmental impact statement was being completed.

<sup>c</sup>Data not applicable for wind applications.

<sup>d</sup>Applications identified as “other” —for example, those that were closed for administrative reasons other than withdrawal or denial—did not fit in any of the listed categories.

Of the 17 wind and solar projects that had been granted a right-of-way, 7 were in operation and 3 were under construction as of the time of this report. The remainder were delayed for various reasons—such as bankruptcy or changes in the type of technology applicants plan to install—or had been terminated. (See app. II for the status and details of authorized projects for all types of renewable energy.)

Of the 109 wind and solar energy applications that were identified as pending, 2 had been approved through a signed decision at completion of environmental analysis but were not considered authorized because a right-of-way had not been issued, and 20 applications had entered the environmental analysis process as of the time of our review. The remaining applications were in earlier stages of the review process. According to BLM officials, some of these applications are not likely to be considered or approved because of where they stand in the queue of applications for that parcel of land. For example, for some especially

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desirable parcels, two or more applications may be in the queue for a right-of-way. Applications are processed in the order received, and applications that are further down the queue for the same parcel of land will be considered only if the first application for that parcel is withdrawn or denied. In other cases, BLM officials told us, applicants were no longer actively pursuing their applications but had not yet formally withdrawn them.

Applications were withdrawn or denied for various reasons. According to BLM officials, some applicants withdrew because of concerns regarding the financial market and concerns over the presence of cultural and natural resources located in the project area. Regarding applications that were denied by the agency, BLM officials told us that a majority were denied because applicants did not provide sufficient information—such as technical details associated with their projects—for BLM to process the applications. The next most frequently identified reason for denial was that developers could not demonstrate the technical or financial capability to carry out their projects.

Permitting for the 17 authorized wind and solar projects with applications submitted after EPOA 2005 took from less than half a year to almost 5 years from initial application submission to right-of-way authorization, according to our questionnaire results. Average permitting time frames differed depending on the type of project application; it took about 3.5 years to complete the permitting process for solar projects and about 2.5 years for wind projects.<sup>32</sup> Some of this difference stems from the fact that most wind applications were processed using environmental assessments rather than environmental impact statements, whereas all authorized solar applications were processed using environmental impact statements—and processing applications using environmental assessments took roughly two-thirds as long, on average, as processing applications using environmental impact statements.

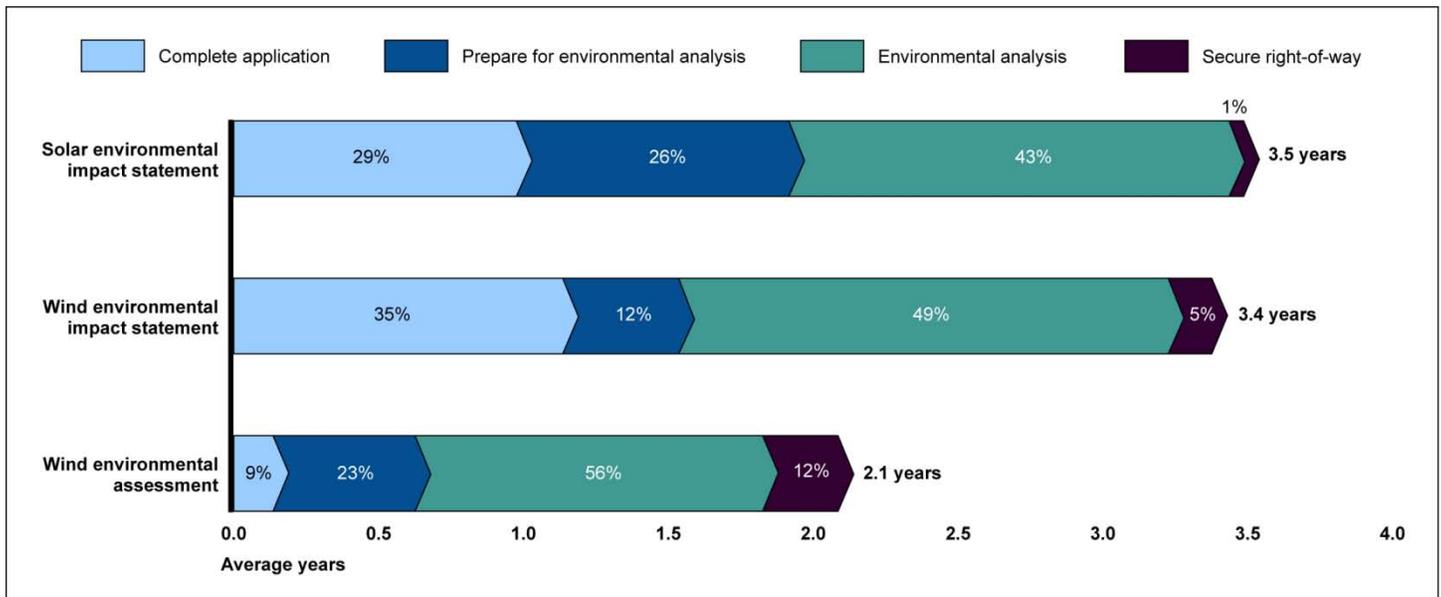
In addition, for those wind and solar applications processed using environmental impact statements, the time necessary to complete the application represented about one-third of total processing time. For wind applications processed using environmental assessments, the time to

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<sup>32</sup>Before applying for a permit for a utility-scale wind project, applicants generally obtain permits for testing and siting. For projects issued a right-of-way, the additional time to obtain these permits ranged from less than one year to about 3.4 years.

complete the application represented a smaller portion of the total processing time—about 9 percent. Most of the remainder was spent preparing for or conducting the environmental analysis (see fig. 2).

**Figure 2: Average Time Frames for Stages in Processing Authorized Solar and Wind Project Applications Submitted after EPA Act 2005 Using Environmental Assessments and Environmental Impact Statements**

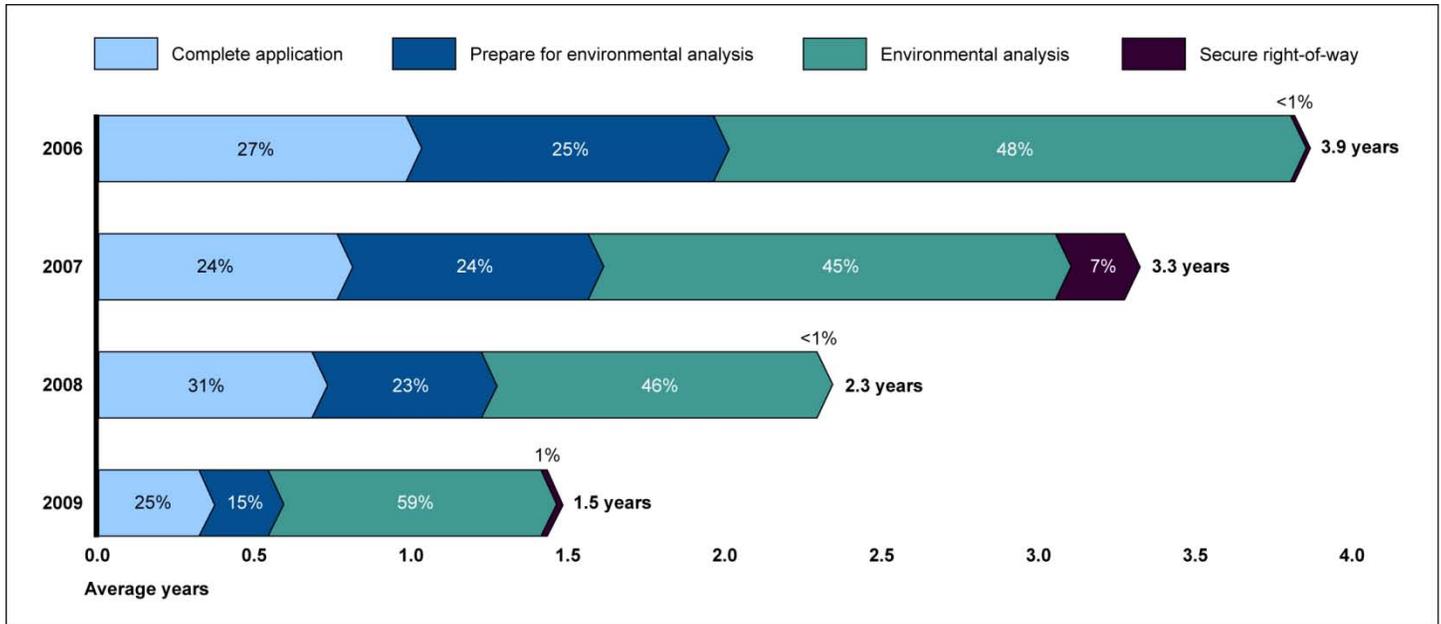


Source: GAO analysis of BLM questionnaire results.

Note: This figure represents 17 wind and solar projects authorized by BLM. As noted in table 1, for one solar project, four applications were submitted, but because these four applications were processed simultaneously, we treated them as a single application in this analysis.

BLM officials also reported substantially shorter processing times for wind and solar applications received in more recent years. Specifically, authorized wind and solar project applications submitted in 2006 took an average of about 4 years to process, whereas those applications submitted in 2009 averaged about 1.5 years (see fig. 3). According to BLM officials, these time frames may have decreased because BLM field office staff have gained experience in processing renewable energy applications.

**Figure 3: Average Time Frames for Stages in the Processing of Applications for Authorized Wind and Solar Projects, by Year Submitted**



Source: GAO analysis of BLM questionnaire results.

Notes: This figure represents 17 wind and solar projects authorized by BLM. As noted in table 1, for one solar project, four applications were submitted, but because these four applications were processed simultaneously, we treated them as a single application in this analysis. In addition, the data for 2006 represent four applications (one wind environmental assessment and three solar environmental impact statements); for 2007, nine applications (three wind environmental assessments, one wind environmental impact statement, and five solar environmental impact statements); for 2008, two applications (two solar environmental impact statements); and for 2009, two applications (one wind environmental assessment and one wind environmental impact statement).

**BLM Received Applications for 29 Geothermal Projects since 2005 and Approved 8 for Construction, with Permitting Time Frames from 1 to 4 Years**

From EAct 2005 through May 2012, BLM received applications for 29 new utility-scale geothermal projects, most of which were submitted from 2007 through 2009 for development in Nevada. Each component of the application process for developing utility-scale geothermal projects—exploration plans, geothermal drilling permits for individual wells, and utilization plans for constructing and maintaining the geothermal power plant—requires environmental analysis and agency approval. As of the time of this report, of these 29 proposed projects:

- BLM approved 25 exploration plans, with the remaining 4 projects suspended by the applicants.

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- Associated with the 25 projects approved for exploration, BLM approved 168 geothermal drilling permits to drill individual wells for developing these projects.
  - BLM subsequently approved 8 of the 25 projects for construction and maintenance; 3 of these projects were operational, and another was under construction.

Some of the 25 applications for which geothermal exploration plans had been approved did not progress to approval of construction because, during the exploration phase, applicants did not find sufficient geothermal resources to justify constructing a plant. In other cases, according to agency officials, financial difficulties constrained applicants' ability to drill wells and construct power plants. A few other projects were early in the exploration process and had not yet moved to the construction phase, according to BLM officials.

Time frames for obtaining the multiple approvals and permits necessary for utility-scale geothermal power plants ranged from 1 to 4 years, in part because of the time needed to explore and find adequate geothermal resources and also because of the time needed to process applications at each approval stage. On average, it took about 1.3 years for approval of exploration plans, about 124 days for approval of drilling permits, and about 1.3 years for approval of construction plans.

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**Wind, Solar, and Geothermal Projects Applied for and Authorized since EAct 2005 Total 5,450 Megawatts of Generating Capacity**

BLM-authorized renewable energy projects sited on federal lands and applied for since EAct 2005 have a total electricity-generating capacity of about 5,450 megawatts—a substantial increase over the capacity for renewable energy generation approved before EAct 2005, which was about 1,360 megawatts. Of this 5,450-megawatt capacity, authorized wind projects contributed about 800 megawatts, solar projects about 4,200 megawatts, and geothermal projects about 450 megawatts.<sup>33</sup>

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<sup>33</sup>BLM has signed a record of decision for two additional projects (one wind energy and one solar energy) that have the potential to generate an additional 1,800 megawatts from projects sited on federal lands. Nevertheless, because these projects had not been issued a right-of-way as of the time of this report, they are not included in our total of authorized projects.

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As previously noted, EAct 2005 established a goal that the Secretary of the Interior “seek to have approved non-hydropower renewable energy projects located on public lands with a generation capacity of at least 10,000 megawatts of electricity” by 2015. The 5,450 megawatts for authorized projects discussed above contribute to this goal, as do megawatts for projects that have been approved but for which an authorization has not been issued.<sup>34</sup> Other megawatts that contribute to this goal include those from renewable energy projects on non-Interior lands that rely on BLM rights-of-way for “connected actions” essential to the project, such as transmission corridors. BLM officials also told us that the megawatts associated with projects approved before EAct 2005 contribute toward meeting the goal. In October 2012, with the approval of a large wind energy project, Interior officials announced that the department had surpassed the 10,000-megawatt goal.

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## Agencies Have Taken Several Steps to Foster Renewable Energy Development on Federal Lands since EAct 2005

Since EAct 2005, the federal land management agencies—primarily BLM but also other Interior agencies and the Forest Service—have developed and revised policies to address renewable energy development on federal lands, formalized collaboration within and across their respective agencies and with state and local governments, and devoted increased resources to process renewable energy permit applications. In addition, BLM—partly in response to our review—has drafted a policy to help guide and assess these efforts to help ensure they are achieving their intended purposes.

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## Agencies Have Created Policies Aimed at Improving Renewable Energy Development

Since 2005, BLM has developed and revised policies aimed at improving renewable energy permitting and development on its lands through various means. Other agencies—including the Fish and Wildlife Service and the Forest Service—have also developed renewable energy policies. Although some of these steps began before EAct 2005, BLM officials said they saw the need for continual improvements and changes, given

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<sup>34</sup>As noted, for purposes of this report we considered wind and solar projects as *approved* when a NEPA decision (such as a record of decision) is signed, and we considered a project as *authorized* when a right-of-way is subsequently granted.

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BLM

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the sharp increase in applications for renewable energy permits since EPOA 2005.<sup>35</sup>

BLM has developed and revised policies intended for improving renewable energy development on its lands by means of programmatic environmental impact statements, designation of priority projects, instruction memorandums, and rulemaking.

### **Programmatic Environmental Impact Statements**

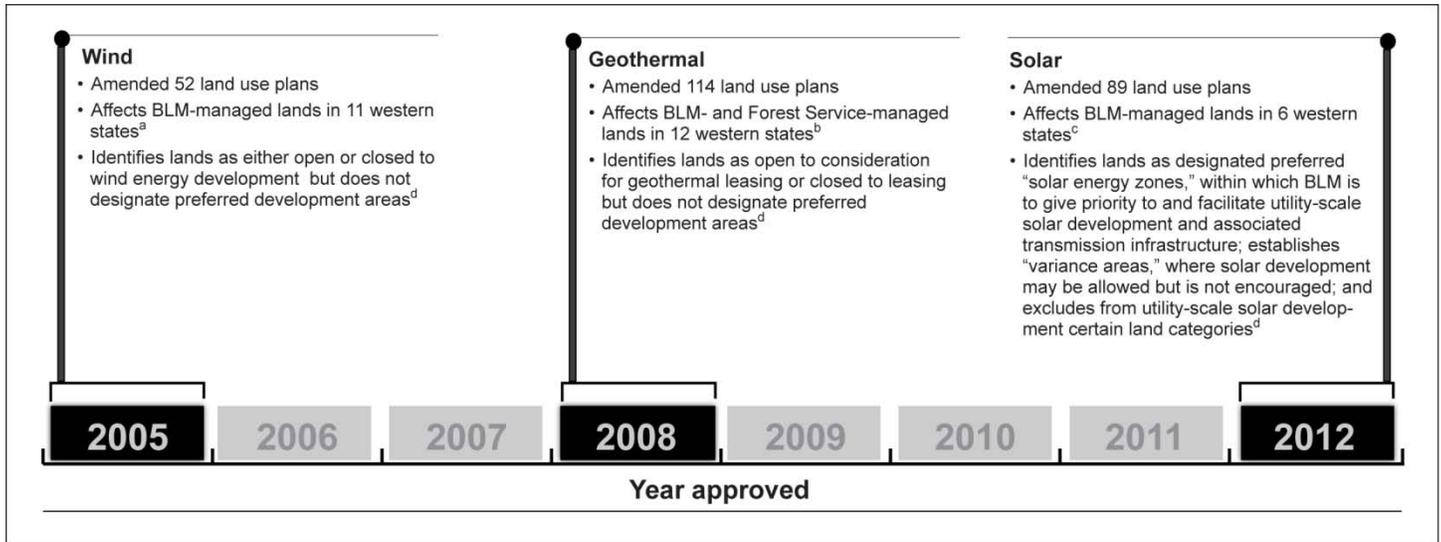
One of BLM's most comprehensive actions taken with respect to renewable energy was the completion of programmatic environmental impact statements for wind, geothermal, and solar energy development, made final in 2005, 2008, and 2012, respectively (see fig. 4). These statements enabled BLM to amend multiple land use plans simultaneously to provide for renewable energy development on BLM-managed lands; in some cases, the statements also established new policies and identified best management practices for energy development. According to BLM officials, the statements were intended to streamline the permitting process for renewable energy development by shortening the amount of time needed for project-by-project environmental impact analyses. The solar statement differed from those for wind and geothermal energy in that it identified specific areas of federal lands most suitable for development—known as solar energy zones—and created incentives, including economic incentives and more streamlined permitting, for development to occur in those locations.<sup>36</sup>

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<sup>35</sup>Several efforts to promote renewable energy development began before EPOA 2005. For example, in May 2001, the President issued an executive order that agencies should take appropriate actions to expedite projects to increase the production, transmission, or conservation of energy. That same month, the President's National Energy Policy Development Group recommended that the Departments of the Interior, Energy, Agriculture, and Defense work collaboratively to increase renewable energy production. Subsequently, in July 2001, the departments created an interagency task force to address how to increase renewable energy production on federal lands.

<sup>36</sup>BLM identified 17 areas, covering approximately 285,000 acres, as solar energy zones.

**Figure 4: Summary of BLM’s Programmatic Environmental Impact Statements for Wind, Geothermal, and Solar Energy Development**



Source: GAO based on BLM documents.

Note: “Year approved” refers to the year when the record of decision was signed for the associated programmatic environmental impact statement. Information in the table generally reflects BLM’s actions as described in the relevant record of decision.

<sup>a</sup>Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

<sup>b</sup>Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

<sup>c</sup>Arizona, California, Colorado, Nevada, New Mexico, and Utah.

<sup>d</sup>A variety of areas are closed to development, including, among others, wilderness areas, wilderness study areas, and national monuments.

Programmatic environmental impact statements can be particularly useful with regard to renewable energy development because many of BLM’s land use plans did not address such development at the utility scale and amending them through a programmatic review was more efficient than doing so one by one. For example, relying on the analysis in the wind statement, BLM amended 52 land use plans, in some cases incorporating wind energy development into land use plans where that energy type had not previously been addressed but where proponents had shown an interest and in other cases restricting wind energy development from wildlife habitat where the agency believed adverse effects could not be

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mitigated.<sup>37</sup> Without the programmatic statement on wind energy, these land use plans would have had to be amended individually, each with its own associated environmental review.

Moreover, in using such programmatic statements, BLM helped address concerns that NEPA's requirements for environmental analysis can be overly time-consuming. According to BLM officials, the geothermal programmatic environmental impact statement approach has shortened the time it has taken BLM staff to ensure the accuracy of NEPA documentation for site-specific activities such as drilling, in part because it supplied a template for environmental assessments. Additionally, BLM officials anticipate that environmental analysis for applications in the new solar energy zones will be streamlined because BLM can tier these analyses to the relevant programmatic analysis.

### **Priority Projects**

In 2009, according to Interior officials, BLM began selecting projects to be given higher priority in application processing so as to focus agency efforts and limited resources on those projects it believed had a greater likelihood of being approved. Recognizing the need for explicit criteria, BLM in 2011 established criteria for prioritizing wind and solar energy projects.<sup>38</sup> These criteria took into consideration natural and cultural resource values—seeking to direct development away from sensitive areas. According to officials, BLM expected that projects on less sensitive lands would take less time to process because these projects would require less consultation, environmental analysis, and mitigation. In addition, BLM also considered those projects for which the application process had progressed far enough to start formal environmental review. Initially, BLM selected priority projects on its own but—recognizing that other agencies are integral to the permitting process or may be affected by project development on BLM-managed lands—it has since coordinated on project selection with other agencies, including the Fish and Wildlife Service, National Park Service, Bureau of Indian Affairs, and Department of Defense.

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<sup>37</sup>Land use plans were included for amendment in all states covered by the wind programmatic environmental impact statement except Arizona and California because separate pending land use plan amendments were being conducted to address wind energy development in those states.

<sup>38</sup>BLM Instruction Memorandum No. 2011-061.

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Some BLM officials told us that additional agency attention paid to priority projects has facilitated processing and streamlined the approval process. For example, the record of decision for all priority projects is now signed by the Secretary of the Interior, which means that the decisions, if challenged, cannot be appealed to the Interior Board of Land Appeals. This board's review can lengthen approval time frames, according to BLM officials.<sup>39</sup>

### **Instruction Memorandums**

Since 2005, BLM has issued multiple instruction memorandums to its field offices containing new policies aimed primarily at development of wind and solar energy. A significant increase in wind and solar permit applications beginning in 2007—many of which BLM officials said were speculative in nature or not detailed enough for consideration—coupled with BLM's relative inexperience in processing such applications made managing the applications a challenge. Several of the memorandums stemmed from a lessons-learned workshop on renewable energy held in January 2011, where officials from several Interior agencies, as well as industry groups, identified challenges and developed suggestions for improvement. The following month, on February 7, 2011, BLM issued three instruction memorandums specifically targeted at clarifying NEPA documentation, facilitating the application review and approval process, and improving the quality of project applications. The instruction memorandums are as follows:

- *A memorandum aimed at clarifying BLM's policy under NEPA as it relates to analyzing applications for utility-scale renewable energy projects.*<sup>40</sup> This memorandum provided guidance to BLM staff on developing and presenting certain information required for environmental impact statements related to renewable energy projects. For example, as part of the NEPA process, BLM is to analyze reasonable alternatives for development. Given the various technologies available for renewable energy development, some alternatives may be proposed that are not technically or economically

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<sup>39</sup>The Interior Board of Land Appeals is an appellate review body that exercises the delegated authority of the Secretary to issue final decisions for the Department of the Interior. Its administrative judges decide appeals from bureau decisions including those related to the use and disposition of federal lands and their resources.

<sup>40</sup>BLM Instruction Memorandum No. 2011-059.

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feasible. This memorandum states that reasonable alternatives include “those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.” It also notes that information about the applicant’s interest and objectives, including any constraints or flexibility in a proposal, is needed to help BLM determine which alternatives to analyze in detail under NEPA and, conversely, which alternatives to eliminate from detailed analysis.

- *A memorandum providing updated guidance to facilitate the application review and approval process by directing early coordination between BLM and other stakeholders.*<sup>41</sup> This memorandum requires that all prospective applicants participate in at least two preapplication meetings with BLM before the agency can accept an application for solar or wind projects.<sup>42</sup> The first such meeting, between an applicant and BLM, helps ensure that the applicant is familiar with BLM’s right-of-way process and allows discussion of issues such as the applicant’s proposal for the project, any land use and siting constraints, potential environmental issues, and potential alternative site locations. The second meeting is to initiate coordination with other federal agencies, such as the Fish and Wildlife Service, as well as with tribal, state, and local government agencies; to provide an additional opportunity to discuss potential environmental and siting constraints; and to modify the proposed project, if necessary, before an application is submitted.
- *A memorandum aimed at improving the quality of project applications, thereby enabling BLM officials to better identify applicants with a serious interest in project development.*<sup>43</sup> This memorandum sought to enable BLM to distinguish between applicants that are serious about developing a renewable energy project and those considered to be land speculators. To enable these distinctions, BLM clarified the expectation that wind and solar project applications are to include detailed project descriptions before BLM can begin further processing and that the agency will not accept plans that are still in the

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<sup>41</sup>BLM Instruction Memorandum No. 2011-061.

<sup>42</sup>Existing BLM regulations encourage applicants wishing to submit a permit application to hold preapplication meetings with BLM but do not require them to do so.

<sup>43</sup>BLM Instruction Memorandum No. 2011-060.

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conceptual phase. Because right-of-way permit applications are processed in the order in which they are received, identifying serious applicants early in the process can help ensure that BLM's time is spent reviewing and processing projects likely to come to fruition.

### **Rulemaking**

BLM in 2011 undertook two rulemaking actions to facilitate the development of utility-scale wind and solar power on federal lands. First, in April 2011, BLM issued a temporary rule to immediately prevent the filing of mining claims in areas contemplated for wind or solar energy development, plus a related rule that would make permanent the temporary ban on mining claims. According to agency statements in the temporary rule, over the previous 2 years, hundreds of new mining claims were filed for areas where wind and solar right-of-way energy applications had been submitted. Also, according to these agency statements, many of these claims were likely to be speculative. Specifically, the temporary rule stated that these claims were filed not for true mining purposes but rather for the mining claimant to try to compel some kind of payment from the renewable energy applicant before relinquishing the mining claim.<sup>44</sup> BLM officials told us that the agency expected to publish the final rule in January 2013. Second, in December 2011, BLM solicited public comments to be used in preparing a proposed rule to establish a competitive process for leasing federal lands for solar and wind energy development.<sup>45</sup> According to agency statements in the proposed rule, a competitive process—rather than the first-come, first-served process currently in use—would enhance the agency's ability to capture fair market value and ensure fair access to leasing opportunities.<sup>46</sup> The

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<sup>44</sup>In December 2012, BLM made approximately 303,900 acres of public land unavailable for mining claims under the temporary rule to protect the solar energy zones identified in the solar programmatic environmental impact statement. 77 Fed. Reg. 74690 (December 17, 2012).

<sup>45</sup>Although BLM refers to this proposed competitive process as leasing, the process will continue to use rights-of-way as the basic permitting approach for wind and solar energy development.

<sup>46</sup>In June 2012, the Department of the Interior's Office of Inspector General issued a review of BLM's renewable energy program, reporting that BLM could generate millions of dollars in additional revenues if it used a competitive bidding process. The report primarily addressed areas of renewable energy related to rental revenue collection, bonding, and monitoring and compliance. See Department of the Interior Office of Inspector General, *Bureau of Land Management's Renewable Energy Program: A Critical Point in Renewable Energy Development*, CR-EV-BLM-0004-2010 (Washington, D.C.: June 12, 2012).

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rulemaking would establish competitive bidding procedures for lands within designated solar and wind leasing areas,<sup>47</sup> define qualifications for potential bidders, and structure the financial arrangements necessary for the process. The agency expects to issue a proposed rule in January 2013.

In 2007, BLM issued a rule revising the agency's geothermal resources leasing regulations to implement EPLA 2005. This rule established, among other things, a new process for competitive leasing, under which BLM is generally to issue a lease to the highest bidder.

## Other Agencies

In addition to new policies created by BLM, the Fish and Wildlife Service in March 2012 issued wind energy guidelines aimed at improving utility-scale wind energy development to reduce potential impacts to species of concern—including migratory birds, bats, bald and golden eagles, and sage grouse—regardless of whether projects are proposed for federal or private lands.<sup>48</sup> Among other aims, these guidelines are intended to promote compliance with wildlife laws and regulations, encourage scientifically rigorous assessments proportionate to risks facing species of concern, and mitigate potential adverse effects on species of concern and their habitats. The guidelines assist developers in identifying species of concern that their proposed projects may affect and also discuss risks to those species. Adherence to these guidelines is voluntary. Regarding Forest Service-managed lands, in August 2011, the Forest Service amended its special use directives to add provisions specific to wind energy projects.<sup>49</sup> Previously, agencywide policy was to deny wind energy development proposals if the proposed development could reasonably be accommodated on lands not managed by the Forest Service. Now, however, this policy is to be considered in conjunction with the agency's encouragement of wind energy facilities on Forest Service-managed lands to help meet the nation's energy needs. No such directives exist for

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<sup>47</sup>Currently, the only such areas are the solar energy zones designated as a result of the solar programmatic environmental impact statement.

<sup>48</sup>Fish and Wildlife Service, *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines* (Washington, D.C.: Mar. 23, 2012).

<sup>49</sup>76 Fed. Reg. 47354. The agency added two new chapters to the *Forest Service Handbook*, addressing wind energy uses and wildlife monitoring and wind energy sites: *Forest Service Handbook* 2709.11 and 2609.13, chapters 70 and 80, respectively, effective August 4, 2011.

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solar projects, although agency officials told us they are drafting such provisions and expect to complete them in 2013. In general, officials with the Forest Service told us that interest in utility-scale wind and solar development on their lands is considerably less than for BLM-managed lands and that, as a result, the Forest Service has relied primarily on BLM guidance when considering proposals for development.

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### Agencies Have Taken Steps Intended to Improve Coordination Within and Across Agencies

Since EPO Act 2005, the federal land management agencies have taken steps intended to improve coordination as a way to streamline the permitting process and promote renewable energy development on federal lands in general. Specifically, coordination has been formalized through regularly established meetings and memorandums of understanding across Interior agencies, as well as with other federal agencies and state and local governments.

To facilitate coordination on renewable energy activities among its component agencies, Interior instituted weekly meetings among its component agency officials at the national level to discuss issues concerning individual renewable energy applications and projects, particularly those identified as priority projects. These “strike team” meetings were intended to formalize coordination to ensure that officials across component agencies are aware of concerns that could affect the development of projects—including critical habitat, cultural or tribal issues, conflicts with national park boundaries or interests, and other environmental issues—and have a recurring forum where such concerns may be aired and resolved. BLM’s national and state renewable energy coordination offices also hold weekly meetings to discuss the status of projects and other issues as they come up.

In several cases, coordination between Interior agencies within certain regions has been formalized through a memorandum of understanding. In January 2008, for example, in recognition of the increase in renewable energy permit applications for projects in Southern California, BLM’s California Desert District and the Fish and Wildlife Service’s Ventura and Carlsbad offices signed a memorandum of understanding to help ensure efficient completion of required consultation under the Endangered Species Act. This memorandum defines the process, products, actions, time frames, and expectations needed to complete the process. In addition, in June 2011, a memorandum of understanding was signed between BLM’s California state office and the National Park Service’s Pacific West Region. The memorandum generally documents coordination procedures the two agencies are to follow in instances

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where proposed renewable energy projects in the region may affect lands under the jurisdiction of the National Park Service. According to Park Service officials, a similar memorandum is being explored between the National Park Service's Pacific West Region and BLM's Nevada state office. Interior officials told us that, given the success of the California effort, the agency is discussing potential amendments to agency manuals to ensure that closer coordination occurs between each BLM state office and relevant National Park Service regional offices. Before putting such amendments in place, however, the agency wants to evaluate different tools to encourage and reward staff for engaging in coordination.

BLM has also formalized its coordination on renewable energy with other federal agencies, as well as with state and local entities. For example, in 2006 BLM and the Forest Service signed a memorandum of understanding to implement certain geothermal leasing and permitting provisions of EPAct 2005, in part to reduce the backlog of geothermal leasing applications. In addition, over the past decade, BLM and the Department of Energy's National Renewable Energy Laboratory have maintained a relationship whereby the laboratory has provided expertise to BLM in support of BLM's management of renewable energy development. According to laboratory officials, the relationship has evolved so that the laboratory provides BLM with assistance on a systematic rather than task-by-task basis. For example, in 2011 BLM and the laboratory signed an interagency agreement for the laboratory to provide technical assistance and training for fiscal years 2011 through 2013. Given the laboratory's expertise, laboratory officials have in some cases assisted BLM offices with individual renewable energy applications by evaluating the technical feasibility of certain proposals. In addition, BLM state offices are working in partnership with state and local agencies. In California, multiple federal land management agencies are working with the California Energy Commission and the California Department of Fish and Game in a collaborative effort to develop the Desert Renewable Energy Conservation Plan for 22.5 million acres of public and private land in Southern California. This effort, initiated under a 2008 memorandum of understanding, is intended to develop a conservation strategy to provide for protection and conservation of the natural resources within the Mojave and Colorado Desert Regions while allowing solar and other renewable energy development in a manner that avoids or minimizes environmental impacts. According to Interior officials, other BLM efforts to coordinate with states have occurred in Wyoming and, to a lesser degree, in Arizona, Nevada, and New Mexico. Officials told us that success in developing renewable energy projects depends on collaboration with states, making such partnerships important.

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## Agencies Have Devoted Additional Resources to Renewable Energy Development

From fiscal year 2010 to fiscal year 2012, BLM reported more than doubling the program funding devoted to wind and solar energy activities, from about \$8 million to about \$16.5 million.<sup>50</sup> During that time, BLM added 64 full-time-equivalent staff—tripling its staff from 32 in fiscal year 2010 to 96 in fiscal year 2012. In addition to these funds, BLM uses cost-recovery fees, which it is authorized to recover from applicants to pay for processing applications for wind and solar energy development.<sup>51</sup> From fiscal year 2009 to fiscal year 2012, BLM reported collecting about \$16 million through these fees;<sup>52</sup> BLM officials estimated that cost-recovery fees represent about half of the total funds received by BLM field offices.

In contrast, funding and staffing for geothermal energy leasing and permitting declined in recent years after the expiration of temporary funding authority created by EPAct 2005. Specifically, the act established the Geothermal Steam Act Implementation Fund to be used to expedite the development of geothermal energy.<sup>53</sup> The act required that certain rents and royalties paid as part of geothermal leases go into the fund until the end of fiscal year 2010. BLM used these funds for coordinating and processing geothermal, permits, among other uses. Authorization for this fund has expired, and after expiration, BLM's geothermal-related obligations declined from about \$7.9 million to about \$2.7 million from fiscal year 2010 to fiscal year 2012, and the number of full-time-equivalent staff was reduced from 45 to 35 during that time.

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<sup>50</sup>These figures represent BLM obligations.

<sup>51</sup>The Federal Land Policy and Management Act of 1976 authorizes the Secretary of the Interior to recover costs, and the Secretary has delegated this authority to BLM. One purpose of this authority is to prevent the federal government from subsidizing private enterprises by paying all their land use application costs. *Nevada Power v. Watt*, 711 F.2d 913, 925 (10th Cir. 1983).

<sup>52</sup>BLM provided us with the total amount in cost-recovery fees collected in these years but did not specify the amount collected in each individual year.

<sup>53</sup>42 U.S.C. § 15873. In 2006, we reported that geothermal applicants faced delays when applying to develop power plants on federal lands, concluding that BLM lacked resources to process leases, amend its land use plans, and process applications, which led to delays in many cases. GAO, *Renewable Energy: Increased Geothermal Development Will Depend on Overcoming Many Challenges*, [GAO-06-629](#) (Washington, D.C.: May 24, 2006).

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The funding and staffing increases for wind and solar energy development were in large part used by BLM to establish renewable energy coordination offices at the national and state levels to, among other duties, help process wind and solar right-of-way permit applications in the four western states with significant renewable energy activity: Arizona, California, Nevada, and Wyoming. BLM also established similar but less well-developed entities, known as renewable energy teams, in several of the other western states with less-significant renewable energy activity.

Interior agencies besides BLM have also recently devoted additional resources toward renewable energy efforts. To accommodate the workload associated with increased interest in renewable energy development, the National Park Service in 2010 hired a permanent, full-time national external renewable energy coordinator and six full-time-equivalent staff focused on coordination for renewable energy permitting. According to agency officials, these positions are supported by using funds from the agency's existing programs. Other National Park Service staff also contribute time to renewable energy efforts on BLM-managed lands as a collateral duty. For example, agency officials told us that several agency staff representing national parks in Southern California have spent time working with BLM and project applicants on renewable energy proposals near national parks in the region; these officials told us they work with BLM and applicants to minimize potential negative effects on park resources, such as impaired views, increased noise and light pollution, and disruption to area wildlife.

The Fish and Wildlife Service also reported receiving more appropriated funds for engagement in renewable energy permitting. Specifically, in fiscal year 2010, the agency's Conservation Planning Assistance Program received a \$1.5 million increase for technical assistance on renewable energy projects. In fiscal year 2011, this program received an additional \$2 million for these activities, for a total increase of \$3.5 million. This \$3.5 million increase continued for fiscal year 2012. The program's funding covered not only time spent contributing assistance to projects proposed on federal lands but also to those proposed on private lands. Some of this funding helped address region-specific increases in workloads. For example, according to agency officials, in fiscal years 2011 and 2012, the Fish and Wildlife Service's Pacific Southwest Regional Office was able to add two to three full-time-equivalent staff positions at the state level and to conduct consultation and project planning at five offices working on renewable energy in the region. Nonetheless, several Fish and Wildlife Service officials told us that they

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completed their increased federal lands renewable energy-related work as a collateral duty done in conjunction with other work responsibilities.

Interior has taken steps to address its component agencies' concerns over the amount of time and funding they commit to the renewable energy permitting process, according to agency officials. For example, Interior has prepared a draft secretarial order delegating authority for cost recovery to the Bureau of Indian Affairs, Fish and Wildlife Service, National Park Service, and others to allow these agencies to collect cost-recovery fees to help pay for their activities as part of the permitting process. A final order is expected to be issued in 2013.

According to Forest Service officials, interest and activity in developing wind and solar energy projects on Forest Service-managed lands have been at a relatively low level, and no specific Forest Service increases in funding or staff comparable to BLM's have been dedicated to renewable energy development. Forest Service officials told us that funding is received through recovery of costs from applicants when needed for specific renewable energy activities. The agency maintains two expert advisors on technical and legal issues related to geothermal leasing, as well as other personnel who work on renewable energy projects and policy as collateral duties. Nevertheless, the Forest Service does not dedicate specific funding to wind, solar, or geothermal energy development; rather, funding for such development is included in agency budget line items covering broader activities. According to Forest Service officials, they do not track the amount the agency spends on renewable energy permitting activities.

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### BLM Plans to Review Its Renewable Energy Activities

To help ensure the efficiency and effectiveness of its renewable energy activities, BLM issued a new instruction memorandum in December 2012 aimed at providing BLM offices involved in renewable energy activities with a better understanding of renewable energy policies and regulations and to provide clarity and consistency in the goals of the agency's renewable energy activities. The memorandum—developed partly in response to our review—directs the national renewable energy coordination office to establish an Oversight and Implementation Plan. This plan is to establish an internal review to be performed annually by the national renewable energy coordination office, beginning in fiscal year 2013. The review is intended to ensure BLM compliance with renewable energy regulations and policies and to ensure that guidance is applied appropriately and consistently throughout BLM. In addition, the plan is to

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call for collaboration among the various offices in the development of future renewable energy policies.

During our review, some agency officials and stakeholders acknowledged the importance of greater resources and coordination in facilitating the permitting process but also informed us of areas for improvement—thereby indicating the importance of assessing the permitting process. For example, one agency official and some stakeholders told us that BLM field offices were not always consistent in their approach to renewable energy permitting or in their willingness to coordinate on renewable energy projects; they said that BLM could do more to help ensure consistency in coordination. An ongoing oversight and improvement plan can assist BLM in identifying needed improvements to its renewable energy permitting process.

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## Factors Related to Permitting, as Well as Market and Other Forces, Affect the Pace of Renewable Energy Development on Federal Lands

According to BLM officials' responses to our questionnaire and interviews we conducted with others, including industry representatives, many factors can affect the pace of renewable energy development on federal lands. Some of these factors relate to the land management agencies' approval and permitting processes, primarily BLM's, with BLM respondents and others identifying some factors that facilitate and others that hinder the permitting process. Other factors identified as important include some related to broader market forces, which operate outside of the permitting process and therefore beyond the agencies' direct control.

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## Agency Officials and Others Identified a Number of Factors Related to Permitting That Can Facilitate or Hinder the Process

Agency officials, industry representatives, and other stakeholders we spoke with identified several key factors affecting the processing of renewable energy applications. Factors facilitating the permitting process include coordination among the involved parties and resources the agency can devote to permitting; factors that may hinder or slow permitting include the quality of submitted applications and managing for the presence of natural and cultural resources on proposed development locations.<sup>54</sup>

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<sup>54</sup>We provided questionnaire respondents with a list of potential factors related to permitting and asked them to identify those that facilitated and hindered the process for each individual project. See appendix I for a full description of our methodology.

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## Facilitating Factors

Factors identified as facilitating the permitting process are generally related to coordination among the parties involved in permitting and the availability of BLM resources.

### **Coordination among Parties Involved in the Permitting Process**

BLM respondents identified the quality of coordination between parties involved in permitting individual projects as among the top factors that facilitated the permitting process for each of the three energy types we reviewed. Such coordination occurs throughout the application process, including the initial request for an application; when key portions of the application, such as the plan of development, are made final; when environmental analyses are conducted and NEPA documentation is prepared; and the issuance of the right-of-way. It also happens among several parties—between the applicant and BLM staff, among staff within BLM, and between BLM staff and staff from other federal and nonfederal agencies.

BLM respondents identified one forum for coordination as particularly helpful in facilitating the permitting process: participation in preapplication meetings, where coordination occurs among multiple parties. These meetings, which take place before an applicant submits an initial application to BLM, are meant to provide opportunities for applicants, BLM officials, and other stakeholders to discuss the permitting process, early concerns about project proposals, and other issues. According to some respondents to our questionnaire, applicants who spent time coordinating with stakeholders early could generally move through the permitting process more easily than those who had not. Several respondents acknowledged that preapplication meetings could be time-consuming, but these respondents also said that such meetings could help ensure that applicants understand BLM's permitting process and required documentation, select appropriate locations to site projects (e.g., to avoid areas with environmental or other constraints), and submit an adequate application. Concerning one application, a respondent explained that frequent and early coordination between BLM and the applicant clarified expectations for both parties as to what information the applicant needed to provide to BLM, thus preventing delays associated with unanticipated surveys or studies that might otherwise have been required.

Such coordination often involved other federal agencies, which BLM respondents and others identified as important. Some Fish and Wildlife Service officials told us that meeting with applicants at the preapplication

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stage can help ensure that potential harm to species and ways to mitigate that harm are identified and addressed in the application. For example, particularly with wind energy projects, officials said they work with applicants to mitigate not only harm to threatened and endangered species and their habitats under the Endangered Species Act but also harm to other species protected under laws such as the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.<sup>55</sup> Fish and Wildlife Service officials also said that they work with applicants at the preapplication stage to prepare species conservation plans and issue species-specific Fish and Wildlife Service permits. These officials said that these early meetings and documentation from applicants provide both the applicant and the agencies greater certainty that the applicant can comply with relevant species protection laws. Similarly, a respondent told us that for one approved project, early coordination between the applicant and officials from a nearby Air Force base helped the applicant select a site that was less likely to interfere with the base's training needs, thereby limiting the potential for conflict as the application progressed through the permitting process. BLM respondents also identified coordination with state, local, and tribal governments as facilitative, although to a lesser degree than coordination with federal agencies.

Most representatives of industry and environmental groups we spoke with commended BLM's efforts to enhance coordination, but they suggested that improvements could still be made. For example, one industry representative suggested that preapplication meetings could be more beneficial if BLM designated one staff member as coordination leader for a particular project. This individual could then be responsible for setting deadlines and holding the various other participants accountable for completing their respective tasks in a timely manner.

### **Availability of BLM Resources to Support Permitting**

BLM respondents frequently cited the availability of resources as an important factor in the permitting process. They identified the importance of (1) cost-recovery funds provided by applicants to cover agency permitting costs for wind and solar energy projects and (2) internal BLM

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<sup>55</sup>The Fish and Wildlife Service has recommended that developers document in writing their actions to avoid, minimize, and compensate for potential adverse impacts. The Fish and Wildlife Service refers to this documentation as Bird and Bat Conservation Strategies.

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resources used to support activities such as administration and policy development.

The cost-recovery funds that BLM requires applicants to submit before it processes wind or solar applications pay for agency permitting expenses, such as reviewing applicant-provided information and studies, preparing environmental analyses, and recording information in agencywide databases. According to BLM officials, BLM's expenses are generally substantial given the scale of most renewable energy projects and required reviews, ranging from \$50,000 to almost \$400,000. Without receiving at least a portion of its expenses in the form of cost-recovery funds, BLM does not begin processing an application; any delay in receipt of these funds can cause additional delays throughout the permitting process. Several respondents noted that in certain cases the applicants never provided cost-recovery funds, even after multiple BLM requests.

In addition to cost-recovery funds, BLM provides internal resources to support administrative activities not specific to individual applications, as well as to maintain adequate staffing with sufficient expertise to process renewable energy applications. BLM officials and industry representatives told us that when BLM first began receiving applications for utility-scale solar development, it did not have expertise in either solar energy development or in processing permits for this type of right-of-way. Over the last few years, however, BLM has increased the number of its staff and the amount of funding dedicated to renewable energy development and has provided training opportunities to its staff who process applications; agency officials and industry representatives also told us that staff have become more knowledgeable through experience.

Representatives from industry and environmental groups and officials from agencies other than BLM concurred that BLM staff have in more recent years become more knowledgeable about renewable energy in general and the permitting process specifically. Several commented that the pace at which an application was processed depended on the abilities of the assigned project manager and the emphasis placed on renewable energy by the field office processing the application.

### **Other Factors**

BLM respondents to our questionnaire commonly identified two other factors as facilitating the permitting process, although these factors were cited less frequently than those related to coordination or resources. One of these other factors was agency policy and guidance related to energy

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development. Specific policies identified by respondents as particularly helpful for wind and solar applications included programmatic environmental impact statements; instruction memorandums from BLM, including the memorandum addressing NEPA compliance for utility-scale renewable energy development; and a 2003 memorandum containing interim guidance from the Fish and Wildlife Service on avoiding and minimizing wildlife impacts from wind turbines.<sup>56</sup> In addition, one industry representative told us that BLM's solar programmatic environmental impact statement is effective in screening lands for the presence of cultural and biological resources. Another industry representative called the Fish and Wildlife Service's 2012 wind energy guidelines an effective tool that clearly describes agency expectations.

Another facilitating factor identified was the selection of applications as priority projects. Several respondents and industry representatives told us that a priority designation helped because the various stakeholders involved in the permitting process dedicated their attention to reviewing priority projects. Others, however, were less certain of benefits. A few industry representatives told us they did not observe a reduction in application processing times. Also, one BLM respondent told us that, although the designation of a solar application as a priority project facilitated the permitting process for this project, it also encouraged officials to process the application faster than was appropriate, given that the necessary biological and cultural surveys had not been completed.

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## Hindering Factors

BLM respondents to our questionnaire and other agency and industry representatives we spoke with identified several key factors that could delay the processing of renewable energy applications, such as application quality and other applicant-related factors, as well as factors related to managing for natural and cultural resources.

Respondents identified the quality of a renewable energy application, including key components such as the plan of development for wind or solar projects, as among the top factors hindering the permitting process. The plan of development for wind and solar projects is to include information on structures and facilities associated with the proposed

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<sup>56</sup>This guidance was replaced by the Fish and Wildlife Service's March 2012 wind energy guidelines.

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project, engineering specifications, maps, and other items. Similarly, applications for geothermal power plants are to include a detailed utilization plan, completed and signed facility construction permit, and completed and signed site license. According to BLM officials, this information allows them to determine the scale and scope of the proposed development and begin analyses to determine project feasibility. The agency does not begin processing applications until the information is complete. Since many applications require more information than is initially submitted, this step may delay processing, depending on how much additional information is requested by BLM and the applicant's ability to respond. For example, one respondent to our questionnaire said that in addition to poorly defining the project, an applicant continually altered key application components—including project scope, design, and technology—which made it difficult for BLM officials to analyze impacts on natural and cultural resources and process the application in a timely fashion. BLM officials also told us that some applicants did not include detailed information necessary to begin review, such as technical plans for engineering and hydrological design or stormwater management, which delayed processing of the applications. When critical components like these are missing from an application, delays result. BLM questionnaire respondents reported that in some instances applicants did not respond to the agency's requests for additional information or responded with incomplete information, leading to denial of their applications. As noted, our analysis showed that the most prevalent reason for denial was that an applicant did not provide information BLM requested that was needed to process the application.

On the other hand, several industry representatives told us that the amount of documentation necessary to develop a project on federal land is, in their view, at times excessive. Some representatives told us that additional information and studies requested by the agency can be time-consuming and expensive to provide, thereby delaying projects, and, in their opinion, are not always necessary. For example, one applicant for a wind energy project wanted to incorporate into the application studies on golden eagles, a protected species, that had recently been completed for areas close to the proposed project site. The Fish and Wildlife Service, however, requested site-specific studies, which could take 3 to 5 years.

Similarly, several questionnaire respondents identified applicants' requests for BLM to delay the processing of their applications as hindering the permitting process. The respondents noted several reasons that applicants might make such requests, including the need for more time to respond to BLM's requests for additional information and changes

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to agency policies or fees. For example, applicants might have requested a delay because they wanted to wait until the effects of BLM's recently issued programmatic environmental impact statement for solar energy development could be determined. In other cases, costs associated with development—such as BLM rental fees paid by the applicant for siting a project on federal land or the costs required for mitigation efforts necessary at the project site—can cause an applicant to request a processing delay. One questionnaire respondent reported that an applicant for a solar energy project requested a BLM delay when BLM quoted rental rates higher than the applicant expected.

BLM questionnaire respondents identified several other factors that, to a lesser degree, hindered the processing of applications, including managing for the presence of threatened or endangered species, or other species of concern, and managing for the presence of tribal, cultural, or historic resources. For example, for one pending solar application in Nevada, BLM officials noted that the applicant is performing additional wildlife and environmental analyses and consultation with the Fish and Wildlife Service to avoid impacts to the desert tortoise. For other projects, managing for the presence of tribal, cultural, or historical resources can contribute to the time it takes to process an application. In some areas, a burial site or a place of sacred significance may require extensive tribal consultation. For one project, an industry representative told us that extensive tribal consultations led to the applicant's changing the project's design about 15 times. Ultimately, according to this representative, the applicant spent thousands of hours on archaeological reviews and moved the project to prevent any degradation of culturally sensitive areas. This representative told us that the lack of specificity in the regulation guiding tribal consultation makes it difficult to ascertain whether an applicant's proposed mitigations for sensitive resources are likely to be adequate. As a result, according to this representative, lawsuits may still ensue, further delaying development even after a project has been approved.

BLM questionnaire respondents also identified requirements for state or local laws as factors that can hinder the permitting process. Specifically, several respondents told us that compliance with the California Environmental Quality Act can add procedural layers to processing applications in California.

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## Market and Other Forces Outside the Permitting Process Also Play a Role

BLM questionnaire respondents, other BLM and federal agency officials, and industry representatives we spoke with also identified as important some factors outside of the permitting process and beyond agency control. Specifically, market forces and other factors influence whether renewable energy projects on federal lands are proposed, funded, and completed. Some of these factors relate to demand for renewable energy, including competition from electricity generated through other sources, and others relate to supply, including the availability of electrical transmission lines. Such forces can play a key role for any utility-scale renewable energy project by setting the financial backdrop for the project, according to industry representatives. For an applicant to secure financing for renewable energy projects on federal lands, investors generally require some assurance that the costs to construct the project and produce the energy will not exceed revenues from selling that energy. For example, BLM officials we spoke with told us that one reason that some renewable energy projects were withdrawn was that financing was not available because of concerns about whether the project could repay its investment costs. These officials said that financing for permitting, construction, and other aspects of development is more likely to be available to applicants who demonstrate that demand is sufficient and that the cost of supplying power allows for profitability.

According to agency officials and industry representatives, demand for electricity from renewable sources can be influenced by such factors as competition from other sources of energy and the presence of renewable portfolio standards. As natural gas prices have decreased in recent years,<sup>57</sup> renewable energy sources may have become less attractive to electricity purchasers and investors. Because wind and solar energy development provides an intermittent supply of electricity, purchasers and investors may find other, more steady supplies of electricity more attractive. In addition, demand for renewable energy may be affected by

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<sup>57</sup>For more information about the increased availability and recent price declines of natural gas in the United States, see GAO, *Oil And Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks*, [GAO-12-732](#) (Washington, D.C.: Sept. 5, 2012).

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the presence of renewable energy portfolio standards;<sup>58</sup> at least 29 states have such standards in place, under which utilities are required to derive a minimum percentage of total electricity they sell from renewable energy sources. Such standards may increase demand for renewable energy overall, but because an increasing number of these state standards have been or are nearly met, the utilities required to comply with these standards may no longer be interested in purchasing additional renewable energy within the next several years, according to industry representatives. BLM respondents noted that applicants sometimes struggled to find buyers for their electricity and, consequently, had difficulty pursuing their projects. Industry representatives told us that establishing power purchase agreements—contracts between energy producers and energy purchasers—was a key part of the success of their renewable projects, and several questionnaire respondents noted that some wind and solar projects could not move forward because the applicants were unable to secure such agreements. In one case, a BLM official noted that the inability of a solar project to secure a power purchase agreement contributed to the cancellation of a 700-megawatt project after BLM had authorized the project's right-of-way permit.

Officials we spoke with also identified factors influencing the cost of supplying renewable energy—most notably the accessibility of transmission lines and the availability of government incentives—as having a role in the pace of energy development on federal land. According to agency officials and industry representatives, the availability of nearby power transmission and distribution lines and access to these lines are critical to the economic viability of a renewable energy project, regardless of whether the project is located on federal or nonfederal lands. Often, however, renewable energy sources are abundant in areas where transmission lines are scarce—increasing the overall difficulty and cost of supplying renewable energy. Moreover, the construction of new transmission lines can be costly and can face its own regulatory and

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<sup>58</sup>A renewable portfolio standard provides states with a mechanism to increase renewable energy generation using a cost-effective, market-based approach that is administratively efficient. Such a standard requires electric utilities and other retail electric providers to supply a specified minimum amount of customer load with electricity from eligible renewable energy sources. The goal of such a standard is to stimulate market and technology development so that, ultimately, renewable energy will be economically competitive with conventional forms of electric power. Existing portfolio standards vary from state to state. California, for example, has a renewable energy portfolio standard of 33 percent by 2020, and Arizona has established a goal of 15 percent by 2025.

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environmental challenges, including separate environmental analyses. For example, several BLM officials in Wyoming told us that not having a sufficient transmission infrastructure has been a deciding factor in some companies' decision to suspend or halt their renewable energy projects. In addition, we were told that the availability of government incentives can affect the cost of producing electricity from renewable resources. For example, the federal tax code includes special tax incentives for solar energy development, which can help increase the potential profitability of planned solar projects. Such tax credits can be useful, although less so if available financing is limited, because without financing for an initial investment, projects that might benefit from tax credits would not be built in the first place. As part of a federal response to the 2008 recession, the American Recovery and Reinvestment Act of 2009 expanded a number of existing tax incentives, including ones for renewable energy development. Several industry and government officials we spoke with cited the Energy Production Credit (also known as the Production Tax Credit) for wind facilities in particular as an important incentive for encouraging the development of several new wind projects. However, this tax credit was scheduled to expire at the end of calendar year 2012,<sup>59</sup> which, according to some industry representatives, likely contributed to a reduction in the number of proposed wind projects. According to a respondent to our questionnaire, this uncertainty hampered one applicant's ability to attract investors, and the applicant ultimately found the project no longer economically viable.

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## Agency Comments and Our Evaluation

We provided a draft of this report for review and comment to the Departments of Agriculture, Energy, and the Interior. In written comments (reproduced in app. III), the Department of Agriculture concurred with our findings, while the Departments of Energy and the Interior had no comments.

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As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the

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<sup>59</sup>Enacted on January 2, 2013, the American Taxpayer Relief Act of 2012 extended the Energy Production Tax Credit and modified its requirements, allowing projects to be eligible for the credit as long as project construction begins by a deadline of December 31, 2013. This is a difference from past years, where projects were required to be completed and producing electricity by the deadline to be eligible for the credit.

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report date. At that time, we will send copies to the Secretaries of Agriculture, Energy, and the Interior; appropriate congressional committees; and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions regarding this report, please contact me at (202) 512-3841 or [fennella@gao.gov](mailto:fennella@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to the report are listed in appendix IV.

Sincerely yours,

A handwritten signature in black ink that reads "Anne-Marie Fennell". The signature is written in a cursive style with a large initial "A" and a long horizontal line extending from the end of the name.

Anne-Marie Fennell  
Director, Natural Resources and Environment

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# Appendix I: Objectives, Scope, and Methodology

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This report examines (1) the status of renewable energy permitting on federal land, including time frames for processing permits applied for since the Energy Policy Act of 2005 (EPAcT 2005); (2) actions the agencies have taken to facilitate renewable energy development on federal lands, particularly since the passage of EPAcT 2005; and (3) factors affecting renewable energy development on federal land.

To address our first objective, we identified applications for utility-scale onshore wind and solar projects submitted to the Bureau of Land Management (BLM) after enactment of EPAcT on August 8, 2005, through May 31, 2012, by asking the BLM renewable energy coordination office to query the BLM database designed to track such applications. We also identified geothermal drilling permit applications and associated utility-scale geothermal project applications submitted to BLM during the same time period by asking BLM to query the agency database designed to track geothermal permits. We contacted BLM because it is the agency responsible for permitting almost all applications submitted for renewable energy development on federal lands. We used the results of this query to group the permits according to the utility-scale projects of which they were a part. After reviewing the lists of applications and correcting for any obvious duplication and other errors, we sent each BLM state office a list of applications for projects located in that state and asked officials to verify our lists' accuracy. In some instances, we deleted some applications because BLM officials informed us that certain applications were submitted to BLM before enactment of EPAcT or were submitted for resource exploration or testing without being part of utility-scale development. BLM officials also identified applications that met our criteria but did not appear in their database; we added those applications to our analysis. We identified a total of 65 permit applications for wind projects, 351 for solar projects, and 29 for geothermal power plants, as well as 405 applications submitted for geothermal drilling permits from August 8, 2005 through May 31, 2012.

We distributed an electronic questionnaire to BLM officials for all projects meeting our criteria. We developed questionnaires for each energy type. For each application, we asked respondents to identify the dates of certain milestones (e.g., the date the application was received or the date it was considered complete) and the factors that facilitated or hindered processing of that particular application. Although the databases contained some of the milestone information we collected through our questionnaires, they did not include information for each of the dates needed for purposes of our analysis. To encourage questionnaire recipients to respond, we held meetings with national and state BLM

officials to explain the questionnaire's purpose, followed up by telephone and e-mail, and obtained a 100 percent response rate for projects meeting our criteria.

We sent the completed questionnaires to a third-party contractor to compile the results, checked the compiled results to ensure their accuracy and reliability, and followed up as needed to clarify incomplete or ambiguous responses. In some cases, we eliminated certain responses from our analysis because we could not obtain sufficiently complete information from the respondent. Because our questionnaire did not sample from a population, no sampling errors occurred. Nevertheless, the results of any questionnaire may be subject to errors, commonly referred to as nonsampling errors. For example, differences in how a particular question is interpreted, in the sources of information available to different respondents, or in how data are entered into a database or analyzed can introduce unwanted variability into questionnaire results. We took steps in questionnaire development, data collection, and data analysis to minimize these nonsampling errors. For example, before developing the questionnaires, we met with BLM officials at headquarters, state, and field offices to discuss the permitting process. We also reviewed current policies and legislation relevant to our questions and the analysis of the responses. The questionnaire was designed by GAO questionnaire specialists in conjunction with staff having subject-matter expertise. We pretested a draft of the questionnaire with officials from five BLM state offices—Arizona, California, Nevada, Utah, and Wyoming, the states that received the greatest number of applications—to ensure that the questions were relevant, clearly stated, and easy to understand.

We also conducted semistructured interviews with the special-use coordinators in each of the nine regional offices of the Forest Service. During these interviews, we requested information on the number of applications received and time frames for processing applications, as well as on factors facilitating and hindering the permitting process.

To address our second objective, we reviewed relevant laws, regulations, and agency policies and guidance. We also interviewed officials from the Department of the Interior and its four land management agencies—BLM, the Bureau of Indian Affairs, the Fish and Wildlife Service, and the National Park Service—as well as from the Department of Agriculture's Forest Service. In addition to officials in these agencies' headquarters, we interviewed BLM officials from California, Colorado, Nevada, and Wyoming. We selected California, Nevada, and Wyoming primarily because they represent areas where substantial renewable energy

development on federal lands is taking place, and substantial agency resources are devoted to processing renewable energy applications. We selected Colorado primarily to obtain the perspective about the program from a state with less activity and fewer resources. We interviewed Fish and Wildlife Service officials from the agency's Mountain-Prairie and Pacific Southwest Regions, both selected because of substantial renewable energy development occurring in the regions, and from one state office within each of these regions. We interviewed a National Park Service official from a national park in California because of his experience with renewable energy development near the park. In addition, we interviewed Forest Service officials from all nine Forest Service regions and officials in the wind, solar, and geothermal research programs at the Department of Energy's National Renewable Energy Laboratory in Golden, Colorado. We reviewed strategic plans, agency reports, and reviews of renewable energy development on federal lands; memorandums of understanding between agencies; and programmatic environmental impact statements for wind, solar, and geothermal energy. We also obtained funding and staffing data for BLM from the Department of the Interior's Financial and Business Management System. We assessed the reliability of the data we used in our report by reviewing the methods of data collection and data entry into this system, as well as various agency planning documents, and determined that the data were sufficiently reliable to use in this report.

To address our third objective, we reviewed the results of our questionnaire and semistructured interviews regarding both factors that facilitate and hinder renewable energy development. We also interviewed BLM and other agency officials, as well as representatives from seven industry and two environmental groups, to obtain their perspectives on the permitting process, the time frames and factors associated with processing permit applications, and renewable energy development in general.

We conducted this performance audit from January 2012 to January 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: Authorized Renewable Energy Projects for Which Applications Were Submitted after the Energy Policy Act of 2005

Of the 445 applications BLM received for utility-scale wind, solar, and geothermal projects since enactment of EPOA 2005 through May 2012, BLM authorized 25 projects—7 wind, 10 solar, and 8 geothermal (see table 2). These projects were authorized with the potential to generate about 5,450 megawatts: 800 megawatts from wind, about 4,200 megawatts from solar, and about 450 megawatts from geothermal energy.

**Table 2: Information about Authorized Renewable Energy Projects for Which Applications Were Submitted after EPOA 2005 through May 2012**

Energy type	State	Project name	Potential output (megawatts)	Acres	Year authorized	Status
Wind	AZ	Dry Lake Wind Project	63	13,438	2009	In operation
	CA	Tule Wind Energy Project	124	12,239	2012	Other <sup>a</sup>
	CA	Ocotillo Express Wind Energy Project	315	10,151	2012	In operation
	NV	Spring Valley Wind Project	150	8,600	2010	In operation
	OR	Lime Wind Project	3	107	2010	In operation
	UT	Milford Wind Project, Phase 1	80	110	2008	In operation
	UT	Milford Wind Project, Phase 2	49	34	2010	In operation
	Solar	CA	Blythe Solar Power Project	1,000	7,025	2010
CA		Calico Solar Project	664	4,604	2010	Other <sup>c</sup>
CA		Lucerne Valley Solar Project	45	421	2010	Terminated
CA		Desert Sunlight Solar Farm Project	550	4,144	2011	Under construction
CA		Genesis Solar Energy Project	250	1,950	2010	Other <sup>d</sup>
CA		Imperial Valley Solar Project	709	6,459	2010	Terminated
CA		Ivanpah Solar Electric Generating System	370	3,471	2010	Under construction
NV		Amargosa Farm Road Solar Project	464	6,320	2011	Terminated
NV		Crescent Dunes Solar Project	110	2,094	2010	Under construction
NV		Silver State Solar Energy Project (North)	50	618	2010	In operation
Geothermal	NV	Coyote Canyon Geothermal Project	62	3,960	2011	Other <sup>e</sup>
	NV	Salt Wells Ormat Geothermal Project	40	6,948	2011	Other <sup>e</sup>
	NV	Salt Wells Gradient Geothermal Project	120	15,622	2011	Other <sup>e</sup>

**Appendix II: Authorized Renewable Energy  
Projects for Which Applications Were  
Submitted after the Energy Policy Act of 2005**

<b>Energy type</b>	<b>State</b>	<b>Project name</b>	<b>Potential output (megawatts)</b>	<b>Acres</b>	<b>Year authorized</b>	<b>Status</b>
	NV	McGinness Hills Geothermal Project	90	7,680	2011	In operation
	NV	Wild Rose Geothermal Project	35	13,800	2012	Other <sup>f</sup>
	NV	Blue Mountain Geothermal Power Plant	49	5,252	2008	In operation
	NV	Jersey Valley Geothermal Project	30	7,460	2010	In operation
	UT	Cove Fort Geothermal Project	30	50	2012	Under construction

Sources: GAO analysis of questionnaire results and BLM data.

<sup>a</sup>Right-of-way authorized.

<sup>b</sup>Right-of-way holder filed for bankruptcy, and new owner is seeking to change from concentrated solar power technology to photovoltaic solar technology.

<sup>c</sup>Right-of-way was authorized, but applicant is seeking to change technology from sterling dish suncatcher technology to photovoltaic solar technology.

<sup>d</sup>Project was under construction, but work was halted because of cultural resource concerns.

<sup>e</sup>This project has not yet begun construction because the proponent is exploring for additional geothermal resources.

<sup>f</sup>Construction has not begun given the recent authorization at the time of our review.

# Appendix III: Comments from the Department of Agriculture



United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

1400 Independence Avenue, SW  
Washington, DC 20250

File Code: 1420

Date: DEC 28 2012

Ms. Anne-Marie Fennell  
Director, U.S. Government Accountability Office  
441 G. Street, NW  
Washington, DC 20548

Dear Ms. Fennell:

Thank you for the opportunity to review and provide comments on the draft U.S. Government Accountability Office (GAO) Report on "RENEWABLE ENERGY: Agencies Have Taken Steps Aimed at Improving the Permitting Process for Development on Federal Lands (GAO-13-189)." The Forest Service has reviewed the draft report and generally agrees with its findings.

The Forest Service is committed to the development of renewable energy resources consistent with its multiple-use framework. We are committed to providing for and producing renewable energy resources for the needs of the American public. We concur with your findings.

Thank you again for the opportunity to review this draft report. If you have any questions, please contact Thelma Strong, Chief Financial Officer, at 202-205-1321 or [tstrong@fs.fed.us](mailto:tstrong@fs.fed.us).

Sincerely,

  
FOR THOMAS L. TIDWELL  
Chief



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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Anne-Marie Fennell, (202) 512-3841 or [fennella@gao.gov](mailto:fennella@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, Steve Gaty (Assistant Director), Ulana Bihun, Catherine Bombico, Lee Carroll, Ellen W. Chu, Richard P. Johnson, and Kelly Rubin made key contributions to this report. Important contributions were also made by Catherine M. Hurley, Armetha Liles, Dan Royer, and Kiki Theodoropoulos.

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