1 INTRODUCTION

A number of Executive Orders (E.O.s), Congressional mandates, and federal agency orders and policies promote expedited and concentrated federal action supporting the development of domestic renewable energy resources. The U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) is considering taking further actions to facilitate solar energy development in compliance with these orders and mandates. The U.S. Department of Energy (DOE) is considering actions to do the same. Among these actions, both agencies are evaluating the implementation of new programs or whether to develop new guidance that will further facilitate utility-scale solar energy development and maximize the mitigation of associated environmental impacts.[1]

These agencies are working jointly as lead agencies to prepare this programmatic environmental impact statement (PEIS), "Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States," to evaluate the new proposed BLM program and whether to develop DOE guidance. The "Notice of Intent to Prepare a Programmatic Environmental Impact Statement (EIS) to Evaluate Solar Energy Development, Develop and Implement Agency-Specific Programs, Conduct Public Scoping Meetings, Amend Relevant Agency Land Use Plans, and Provide Notice of Proposed Planning Criteria" (the NOI) was published in Volume 73, page 30908 of the *Federal Register* (73 FR 30908) on May 29, 2008.

This PEIS evaluates the potential environmental, social, and economic effects of the agencies' proposed actions and alternatives in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's regulations for implementing NEPA (Title 40, Parts 1500–1508 of the *Code of Federal Regulations* [40 CFR Parts 1500–1508]), and applicable BLM and DOE authorities.[2] Programmatic NEPA analyses are broadly scoped analyses that assess the environmental impacts of federal actions across a span of conditions, such as facility types, geographic regions, or multiproject programs.

The following sections provide information about applicable federal orders and mandates; solar energy technologies and resources evaluated in the scope of this PEIS; the objectives, requirements, and scope of analyses for the BLM and DOE; the participation of cooperating agencies; the relationship of the proposed programs and strategies evaluated by this PEIS to other programs, policies, and plans; and the organization of the PEIS chapters and appendices.

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1 Utility-scale facilities are defined as projects that generate electricity that is delivered into the electricity transmission grid, generally with capacities greater than 20 megawatts (MW).

2 For the BLM, these authorities include the BLM's NEPA Handbook (BLM 2008); DOI's NEPA Implementing Procedures, 43 CFR Part 46; and Chapter 11 of the DOI's Departmental Manual (DM) 516 (DOI 2008). For DOE, these authorities include DOE's NEPA Implementing Procedures, 10 CFR Part 1021, and the Floodplain and Wetland Environmental Review Requirements, 10 CFR Part 1022.

1.1 APPLICABLE FEDERAL ORDERS AND MANDATES

The following orders and mandates, presented in chronological order, establish requirements for the DOI and/or DOE related to renewable energy development. They provide the drivers for specific actions being taken or being proposed by these agencies to facilitate solar energy development.

1.1.1 Executive Order 13212

On May 18, 2001, the President signed E.O. 13212, "Actions to Expedite Energy-Related Projects," which states that "the increased production and transmission of energy in a safe and environmentally sound manner is essential" (*Federal Register,* Volume 66, page 28357, May 22, 2001). Executive departments and agencies are directed to "take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy." Executive Order 13212 further states that "For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation and where appropriate."

1.1.2 Energy Policy Act of 2005

On August 8, 2005, the Energy Policy Act of 2005 (Public Law [P.L.] 109-58) was signed into law. Section 211 of the Act states, "It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity." To date, the BLM has approved geothermal projects with a total generation capacity of 1,350 megawatts (MW), wind projects with a total capacity of 587 MW, and solar projects with a total capacity of 3,572 MW. Other applications that are being processed could contribute to this goal.

1.1.3 Energy Independence and Security Act of 2007

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) (P.L. 110-140) was signed into law. Section 603 of the EISA requires DOE to assess methods to integrate electric power generated at utility-scale solar facilities into regional electricity transmission systems and to identify transmission system expansions and upgrades needed to move solar-generated electricity to growing electricity demand centers throughout the United States. In addition, this section requires DOE to consider methods to reduce the amount of water consumed by concentrating solar power (CSP) systems.

1.1.4 DOI Secretarial Order 3285A1

On March 11, 2009, the Secretary of the Interior issued Secretarial Order 3285, which announced a policy goal of identifying and prioritizing specific locations best suited for large-scale production of solar energy on public lands (Secretary of the Interior 2009) The Secretarial Order requires DOI agencies and bureaus to work collaboratively with each other and with other federal agencies, individual states, Tribes, local governments, and other interested stakeholders, including renewable energy generators and transmission and distribution utilities, to encourage the timely and responsible development of renewable energy and associated transmission, while protecting and enhancing the nation's water, wildlife, and other natural resources; to identify appropriate areas for generation and necessary transmission; to develop best management practices for renewable energy and transmission projects on public lands to ensure the most environmentally responsible development and delivery of renewable energy; and to establish clear policy direction for authorizing the development of solar energy on public lands. On February 22, 2010, Secretarial Order 3285 was amended to clarify Departmental roles and responsibilities in prioritizing development of renewable energy (Secretary of the Interior 2010). The amended order is referred to as Secretarial Order 3285A1.

As a land management agency with a multiple-use mission, the BLM, consistent with Secretarial Order 3285A1, must make land use decisions that are environmentally responsible and sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The BLM recognizes that for solar energy development to be successful, it must be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values.

1.1.5 Executive Order 13514

On October 5, 2009, the President signed E.O. 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," which requires that federal agencies take efforts to align their policies to advance local planning efforts for energy development, including renewable energy (*Federal Register,* Volume 74, page 52117, Oct. 5, 2009). Specifically, the order states that agencies shall "…advance regional and local integrated planning by…aligning Federal policies to increase the effectiveness of local planning for energy choices such as locally generated renewable energy."

1.2 OVERVIEW OF SOLAR ENERGY TECHNOLOGIES AND RESOURCES CONSIDERED IN THE PEIS

The scope of the PEIS includes analyses of the use of multiple solar energy technologies at utility-scale over the next 20 years on lands within six southwestern states—Arizona, California, Colorado, Nevada, New Mexico, and Utah—where the solar energy resources are among the best in the United States.

Several technologies are currently in use and are being refined for the utility-scale capture of solar energy (i.e., ≥20 MW). The technologies evaluated in this PEIS are CSP, which includes parabolic trough, power tower, and dish engine systems, and photovoltaic (PV) (see Section 3.1 for details on these technologies). The main component that all the technologies have in common is a large solar field where solar collectors capture the sun's energy. In the parabolic trough and power tower systems, the energy is concentrated in a heat transfer fluid (HTF) and transferred to a power block, where steam-powered turbine systems generate electricity using similar technology to that used in fossil fuel–fired power plants. In contrast, the dish engine and PV systems are composed of many individual units or modules that generate electricity directly and whose output is combined; these systems do not use a central power block. Figure 1.2-1 shows a typical solar field for each of these technology types.

Commercially feasible utility-scale solar energy development requires adequate direct normal insolation (DNI) and large areas of land. Under clear sky conditions, about 85% of the sunlight is DNI, and 15% is scattered light that comes in at many different angles. DNI can be used by all solar energy systems, whereas the scattered light can only be used by PV systems. Because the solar resources in the six-state study area have high solar insolation levels, they are highly suitable for utility-scale solar power plants. Direct normal insolation levels in the six-state study area are depicted in Figure 1.2-2; in this PEIS, DNI levels greater than or equal to 6.5 kWh/m^2/day are generally considered to be optimal for solar development. The BLM's analysis in this PEIS is limited to utility-scale solar development on lands administered by the BLM within the six-state study area. DOE's analysis considers all lands within the six-state study area because its support to projects is not restricted to projects located on BLM-administered lands.

The scope of this PEIS is limited to utility-scale solar development, in part, because the Energy Policy Act of 2005 and DOI Secretarial Order 3285A1 require that the BLM take steps to facilitate development at that scale (see Section 1.1). The development of distributed generation, small-scale solar energy facilities, such as roof-top mounted PV systems, is not included in the scope of this PEIS. While such solar energy development will be an important component of future electricity supplies (and is the focus of separate DOE initiatives; see Section 2.5.1), current research indicates that development of both distributed generation and utility-scale solar power will be needed, along with other energy resources and energy efficiency technologies (NREL 2010c). One analysis of available roof space concluded that up to 23% of required electricity supplies could be met with roof-top PV systems, although integrating PV into the electric grid at levels that high could be challenging (Denholm and Margolis 2008). On a per-watt basis, small-scale PV systems are more expensive than utility-scale systems (NREL 2010c). Because these systems typically do not include electricity storage, they cannot provide power during the evenings or at night, and the power output can fluctuate significantly during cloudy weather. As a result, buildings equipped with roof-top PV systems remain dependent on the grid, and electric utilities must maintain adequate generating capacity to provide electricity to these customers when needed. Ultimately, both utility-scale and distributed-generation solar power will need to be deployed at increased levels, and the highest penetration of solar power overall will require a combination of both types (NREL 2010c).

FIGURE 1.2-1 Typical Solar Fields for Various Technology Types: (a) Solar Parabolic Trough (Source: Hosoya et al. 2008), (b) Solar Power Tower (Credit: Sandia National Laboratories. Source: NREL 2010a), (c) Dish Engine (Credit: R. Montoya. Source: Sandia National Laboratories 2008), and (d) PV (Credit: Arizona Public Service. Source: NREL 2010b)

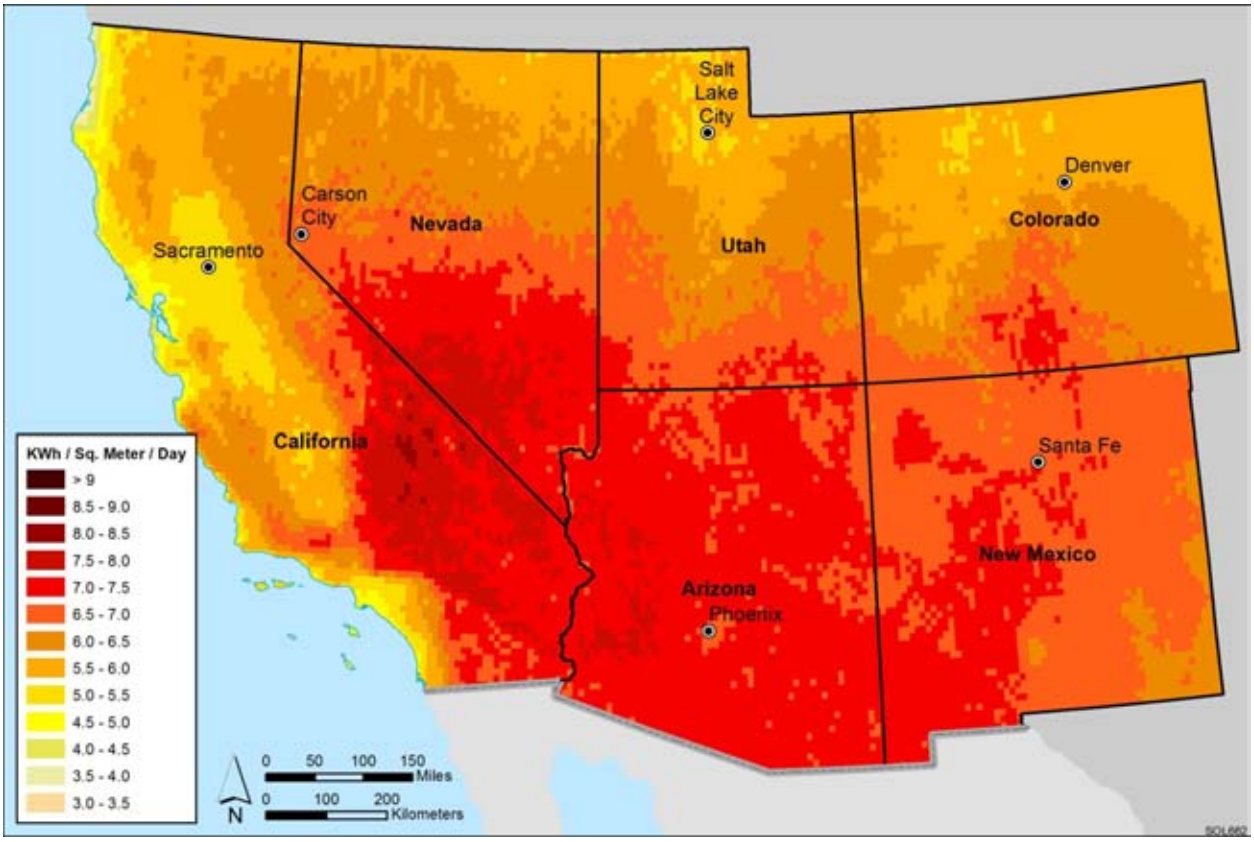

FIGURE 1.2-2 Solar Direct Normal Insolation Levels in the Southwestern United States

1.3 BLM REQUIREMENTS AND OBJECTIVES FOR THE PEIS

The BLM has identified utility-scale solar energy development as a potentially critical component in meeting the applicable orders and mandates discussed in Section 1.1. The BLM administers approximately 245 million acres (>1 million km^2) of public lands in 11 western states and Alaska. This administrative responsibility encompasses stewardship, conservation, and resource use, including the development of energy resources in an environmentally sound manner. Utility-scale solar energy facilities have not yet been constructed on BLM-administered public lands, but there is great interest in such development (see Section 1.3.3 for information on active solar applications on BLM-administered lands).

The BLM developed and issued a Solar Energy Development Policy in 2007 (BLM 2007) to address increased interest in solar energy development on BLM-administered lands and to implement goals to construct renewable energy facilities on public lands. This 2007 policy established procedures for processing right-of-way (ROW) applications for solar energy development projects on public lands administered by the BLM in accordance with the requirements of the Federal Land Policy and Management Act of 1976 (FLPMA) (*United States Code*, Title 43, Section 1701 et seq. [43 USC 1701 et seq.]) and the BLM's implementing regulations (43 CFR Part 2800), and for evaluating the feasibility of installing solar energy systems on BLM administrative facilities. This policy was updated in 2010 by two more detailed

policies that establish a maximum term for authorizations, diligent development requirements, bond coverage, potential best management practices for solar energy development projects, and interim guidance on how to calculate rent for utility-scale solar energy facilities (BLM 2010a,b). These three BLM policies are shown in their entirety in Appendix A, Section A.1.

The BLM's current practice is to evaluate solar energy ROW applications on a project-specific basis. In addition, many of the BLM's land use plans do not specifically address solar energy development; therefore, projects that are not in conformance with the existing land use plan require individual land use plan amendments. Moreover, the BLM does not have a standard set of mitigation measures that would be applied consistently to all solar energy development projects.

The BLM is developing this PEIS to evaluate a proposed program to further support utility-scale solar energy development on BLM-administered lands, as detailed below.

1.3.1 BLM's Purpose and Need

The BLM has identified a need to respond in a more efficient and effective manner to the high interest in siting utility-scale solar energy development on public lands and to ensure consistent application of measures to mitigate the adverse impacts of such development. The BLM is therefore considering replacing certain elements of its existing solar energy policies (described above) with a comprehensive Solar Energy Program that would allow the permitting of future solar energy development projects to proceed in a more efficient and standardized manner. While the proposed Solar Energy Program will further the BLM's ability to meet the mandates of E.O. 13212 and the Energy Policy Act of 2005, it also has been designed to meet the requirements of Secretarial Order 3285A1 (Secretary of the Interior 2010) related to identifying and prioritizing specific locations best-suited for utility-scale solar energy development on public lands.

In order to identify areas best suited for utility-scale solar energy development, the BLM preliminarily identified 24 Solar Energy Study Areas that would be evaluated in the PEIS as part of the proposed program to determine suitability for solar energy development. The BLM applied preliminary suitability criteria to nominate proposed Solar Energy Study Areas in each of the six states for evaluation in the Solar PEIS; these criteria included high solar resource availability, suitable slope, proximity to roads and transmission lines or designated corridors, and size consisting of at least 2,500 acres (8.1 km^2) of BLM-administered public lands. In addition, sensitive lands, wilderness, and other high-conservation-value lands as well as lands with conflicting uses were excluded. These Solar Energy Study Areas were announced on June 30, 2009, in the *Federal Register* (74 FR 31307), and the public and other agencies were provided the opportunity to comment on them. On the basis of the comments received and the resource conflicts identified, Solar Energy Study Area locations and boundaries were refined to create the proposed solar energy zones (SEZs) that would be fully analyzed in the Solar PEIS. A full description of this process is included in Section 2.2.2.2.

Considering the above, the objectives of BLM's proposed Solar Energy Program include:

- Facilitating near-term utility-scale solar energy development on public lands;
- Minimizing potential negative environmental, social, and economic impacts;
- Providing flexibility to consider a variety of solar energy projects (location, facility size, technology, and so forth);
- Optimizing existing transmission infrastructure and corridors; and
- Standardizing and streamlining the authorization process for utility-scale solar energy development on BLM-administered lands.

The anticipated elements of the BLM's proposed Solar Energy Program include:

1. Identification of lands excluded from utility-scale solar energy development in the six-state study area;
2. Identification of priority areas within the lands open to solar energy development that are best suited for utility-scale production of solar energy in accordance with the requirements of Secretarial Order 3285A1 (i.e., proposed SEZs);
3. Establishment of mitigation requirements for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy; and
4. Amendment of BLM land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning.

Chapter 2 provides a detailed discussion of the BLM's proposed action and alternatives.

1.3.2 BLM's Decisions To Be Made

On the basis of the analyses presented in this PEIS, the BLM anticipates making the following land use planning decisions that will establish the foundation for a comprehensive Solar Energy Program:

1. Land use plan amendments to identify exclusion areas for utility-scale solar energy development in the six-state study area;
2. Land use plan amendments to identify priority areas within the lands open to solar energy development that are best suited for utility-scale production of solar energy (i.e., proposed SEZs); and

3. Land use plan amendments to establish design features (i.e., mitigation requirements) for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy (some may be SEZ-specific, as necessary).

In addition to the planning decisions described above, the Secretary of the Interior may decide to withdraw the public lands encompassed by SEZs from potentially conflicting uses through the issuance of a Public Land Order (see Section 1.3.5, BLM Land Withdrawals). Other policy and guidance as described in Section 1.3.3 may also be issued by the BLM regarding procedural elements of the Solar Energy Program on the basis of existing statutes and regulations.

1.3.3 Authorization Process for Solar Energy Development on BLM Lands

Currently, applications for utility-scale solar energy facilities on BLM-administered lands are processed on a project-specific basis as ROW authorizations issued in accordance with Title V of FLPMA and the BLM's ROW regulations (43 CFR Part 2800). When the BLM authorizes the construction of utility-scale solar energy generation facilities on BLM-administered lands, it must comply with NEPA, the Endangered Species Act (ESA), the National Historic Preservation Act, and other applicable statutes and regulations. The BLM's project-specific environmental analysis must address all applicable components of the solar energy generation facility, including, as appropriate, the installation and maintenance of solar collectors, the availability and consumption of water for steam generation and cooling, oil or gas backup generators, the creation and use of thermal or electrical storage, turbines or engines, access roads, electrical inverters and transmission facilities, and water or natural gas pipelines. In addition, solar energy development must be in conformance with the existing, approved land use plan (see Section 1.3.4, BLM Land Use Planning Process). To help meet the requirements of Section 504 of FLPMA to limit unnecessary damage to the environment and the objectives of the implementing regulations (43 CFR 2801.2(a) and (b)) to protect natural resources on the public lands and adjacent lands and to prevent unnecessary or undue degradation to the public lands, the BLM has established sound environmental policies, procedures, and siting and mitigation strategies for solar energy development on the public lands (see Appendix A).

As of February 2010, the BLM had 127 active applications for ROW authorizations for solar facilities to be located on BLM-administered lands (see Appendix B for a complete list of these applications).[3] These include approximately 55 applications for lands in California,

[3] The BLM has received more than 300 such applications to date; some, however, have been terminated because the developer withdrew the application or because due diligence requirements were not met. Some applications cannot currently be processed because they describe lands already applied for by another company. While many of the active applications ultimately may not be issued for a variety of reasons (e.g., withdrawal by applicant, failure of applicant to provide sufficient analysis of impacts and/or agree to meet mitigation requirements), many applicants are providing sufficiently detailed plans and analyses that are likely to result in ROW authorizations. The BLM is proceeding with the processing of these applications during the preparation of this PEIS, but it is planning to incorporate the program established through this PEIS into the processing of applications that occurs subsequent to the release of the Record of Decision. The applications as of February 2010 were used to support analyses in the PEIS; however, as of December 1, 2010, the BLM had 104 active applications, including 30 in California, 35 in Nevada, 36 in Arizona, and 3 in New Mexico.

34 applications for Nevada lands, 34 applications for Arizona lands, and 4 applications for New Mexico lands; there were no applications for lands in Colorado or Utah (see Figure 1.3-1). The applications encompass all of the solar technologies reviewed in this PEIS. They range in power-producing capacity from 4 to 4,100 MW (with an average of about 650 MW), and the amount of land applied for ranges from 40 to 36,000 acres (0.16 to 145.7 km^2) (with an average of about 10,000 acres [45.5 km^2]). The BLM is in the process of reviewing and processing these applications in accordance with BLM's existing Solar Energy Policies (BLM 2007; 2010a,b).

Fourteen of the active applications are being processed as "fast-track" projects (BLM 2010c). These projects, shown in Figure 1.3-1, include applications for which the companies involved have demonstrated to the BLM that they have made sufficient progress to formally start the environmental review and public participation process. They are advanced enough in the permitting process that they could potentially be cleared for approval by December 2010. The proposed fast-track projects total approximately 6,022 MW of generating capacity; one is located in Arizona, four are in Nevada, and the rest are in California.[4]

A number of legislative and departmental initiatives are underway that, if enacted, could provide specific guidance to the BLM on its Solar Energy Program. For example, the BLM may employ alternative procedures for authorizing solar energy development, such as issuing ROWs on a competitive basis in some priority solar development areas. The BLM may also decide to dispose of some parcels of land through land sales or exchanges to support the development of solar energy on a case-by-case basis. The BLM's existing ROW regulations, contained in 43 CFR Part 2800, existing land sale regulations, contained in 43 CFR Parts 2710 and 2711, and existing exchange regulations, contained in 43 CFR Part 2200, provide for these possible procedural approaches. The NEPA analysis contained in the Solar PEIS will be used to the extent practicable to support future decisions; however, in some cases additional NEPA analysis may be necessary. Depending on the timing of such decisions, these program elements may be included in the Record of Decision (ROD) for the Solar PEIS or may be issued in separate decision documents.

1.3.4 BLM Land Use Planning Process

The FLPMA requires the BLM to develop land use plans, also called resource management plans (RMPs), to guide the management of the public lands it administers. An RMP typically covers public lands within a particular BLM field office. The BLM's Land Use Planning Handbook (H-1601-1; BLM 2005a) provides specific guidance for preparing, amending, and revising land use plans.

[4] Six fast-track projects have been approved in California and two have been approved in Nevada: BrightSource Energy's Ivanpah Solar Electric Generating System, Tessera Solar's Imperial Valley and Calico Solar Projects, Chevron Energy Solution's Lucerne Valley Solar Project, NextEra's Genesis Ford Dry Lake Solar Project, Solar Millennium's Blythe and Amargosa Farm Road Solar Projects, and First Solar's Silver State North Solar Project.

FIGURE 1.3-1 BLM-Administered Lands and Active Solar Facility ROW Applications in the Six-State Study Area

As part of the land use planning process, the BLM identifies existing and potential development areas for renewable energy projects (e.g., wind and solar), communication sites, and other uses. The BLM also identifies ROW avoidance or exclusion areas (areas to be avoided but that may be available for location of ROWs with special stipulations, and areas that are not available for location of ROWs). In addition, the BLM identifies terms and conditions that may apply to ROW corridors or development areas, including best management practices to minimize environmental impacts and limitations on other uses that would be necessary to maintain the corridor and ROW values (H-1601-1, Appendix C(E); BLM 2005a). Many of the existing land use plans in the six-state study area do not specifically address ROWs for solar energy development, although they contain many provisions, stipulations, and guidelines that are relevant to such development activities.

Solar energy development projects, as with other implementation actions, must be in conformance with the applicable land use plan. In cases where a proposed solar energy facility is not in conformance with the applicable land use plan, the BLM can reject the application for a ROW or amend the land use plan to allow for the ROW. The BLM must determine whether to initiate a plan amendment process when a proposal changes the scope of resource uses or the terms, conditions, and/or decisions of an approved plan (43 CFR 1610.5-5). Land use plan amendments are subject to environmental review under NEPA and must be completed in accordance with BLM planning regulations (43 CFR 1610 et seq.).

As part of the BLM proposed program, land use plans in the six-state study area would be amended to address solar energy development (see Appendix C for a list of the proposed plan amendments associated with this PEIS). The amendments would become part of the land use plans and would include the exclusion areas, priority solar energy development areas, and required mitigation measures identified in this PEIS. Only approved land use plans can be amended. Land use plans that are undergoing revision or amendment concurrent with the development of the Solar PEIS (e.g., land use plan amendments for fast-track projects) will be reviewed to identify and resolve inconsistencies between the PEIS and individual planning efforts. In the event that the BLM determines that it is appropriate to amend additional land use plans outside the six-state study area, in order to adopt elements of the program, the BLM would initiate the planning process and conduct NEPA analysis incorporating by reference the analysis in the Solar PEIS, as appropriate.

1.3.5 BLM Land Withdrawals

A withdrawal of federal land withholds the land from settlement, sale, location, or entry under some or all public land laws. Withdrawals are accomplished through Public Land Orders for the purpose of:

- Limiting activities to maintain other public values;
- Reserving an area for a particular public purpose or program; or

- Transferring administrative jurisdiction/responsibility for an area from one department, bureau, or agency to another.

The Secretary of the Interior has withdrawal authority, which he can delegate to agency officials in the Office of the Secretary who are appointed by the President and confirmed by the Senate. As a possible mechanism to support the establishment of priority areas that are best suited for utility-scale production of solar energy, the BLM sought and received permission from the Secretary of the Interior to issue a notice of proposed withdrawal for the 24 identified Solar Energy Study Areas. This notice, published in the *Federal Register* (74 FR 31308) on June 30, 2009, segregates the public lands encompassed in the 24 Solar Energy Study Areas (approximately 676,000 acres [2,735.7 km^2]) for up to 2 years from surface entry and mining, while various studies and analyses are conducted to support a final decision on withdrawing the land from conflicting uses. The required withdrawal studies and analyses will be completed as part of the Solar PEIS (see Section 1.3.6.2). The Secretary of the Interior's final decision regarding the withdrawal of these lands will be made based on the Solar PEIS; however, the Secretary's ROD will be made separate from the BLM's ROD for the Solar PEIS.

1.3.6 BLM Scope of the Analysis

The geographic scope of the PEIS for the BLM includes all BLM-administered lands in the six-state study area (i.e., in Arizona, California, Colorado, Nevada, New Mexico, and Utah) (see Figure 1.3-1). This scope was determined based on an internal initial resource assessment showing that these states include the majority of BLM-administered lands with the most prospective solar energy resources suitable for utility-scale development over the next 20 years.

The scope of the impact analysis includes an assessment of the environmental, social, and economic impacts of utility-scale solar facilities and required transmission connections from these facilities to the existing electricity transmission grid. As discussed in Section 1.2, viable utility-scale solar technologies to be deployed over the next 20 years include parabolic trough, power tower, dish engine systems, and PV. These technologies are discussed in greater detail in Section 3.1. For the purposes of the Solar PEIS, "utility-scale" solar energy development is defined as projects capable of generating 20 MW or greater. As a result, the new Solar Energy Program would apply only to projects of this scale; decisions regarding projects that are less than 20 MW would continue to be made in accordance with existing land use plan requirements.[5]

As part of the PEIS process, the BLM considered designating additional electricity transmission corridors on BLM-administered lands to facilitate utility-scale solar energy development. An analysis of this issue conducted during preparation of the Draft PEIS indicated that the majority of BLM-administered lands with developable solar resources are

[5] Co-generation projects involving a mix of solar energy technologies and other energy technologies (e.g., natural gas, wind, hydropower) would be subject to the requirements of the new Solar Energy Program if the solar energy component is 20 MW or greater.

not constrained from development[6] on the basis of the location of existing transmission lines or designated transmission corridors (see Appendix G). This transmission analysis only considered the locations of existing transmission lines and designated corridors and did not look at the available capacity on existing lines (i.e., the analysis assumed lines could be upgraded if needed). On the basis of the results of this analysis, the designation of additional electricity transmission corridors on BLM-administered lands has not been included in the scope of this PEIS. Although the BLM has deemed the designation of new corridors unnecessary, the PEIS does evaluate the potential impacts associated with constructing and operating interconnections from solar energy facilities to the transmission grid.

1.3.6.1 Programmatic Scope

The PEIS evaluates the potential environmental, social, and economic effects of establishing broad solar energy program elements and strategies across the six-state study area. The programmatic analysis will provide the basis for future utility-scale solar energy development decisions. Because the proposed program involves environmental effects over a broad geographic and time horizon, the depth and detail of the impact analysis is fairly general, focusing on major impacts in a qualitative manner.

The PEIS does not assess site-specific issues associated with any future individual solar energy development projects. A variety of location-specific factors (e.g., soil type, watershed, groundwater availability and presence of jurisdictional waters, habitat, vegetation, viewshed, public sentiment, the presence of threatened and endangered species, and the presence of cultural resources) would vary considerably from site to site, especially over a six-state region. In addition, the variations in technology and project size and design would greatly determine the magnitude of the impacts from given projects. The effects of these location-specific and project-specific factors typically cannot be fully anticipated or addressed in a programmatic analysis; such effects must be evaluated at the project level. This PEIS identifies the range of potential impacts and identifies relevant mitigation requirements applicable to utility-scale solar energy development in general. Site-specific and species-specific issues would be addressed during individual project reviews, where resolution of these issues is more readily achievable. NEPA analyses for site-specific solar energy proposals would tier to the Solar PEIS (see Section 1.3.8, BLM Requirements for Further Environmental Analysis).

1.3.6.2 Proposed Solar Energy Zone Scope

In addition to the programmatic analysis described above, the Solar PEIS also provides in-depth environmental analysis to inform the identification of the BLM's proposed SEZs within the six-state study area as those locations that are best suited for utility-scale solar energy development (i.e., high resource value and low [or limited] resource and/or environmental conflicts).

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6 "Constrained from development" was defined as being located more than 25 mi (40 km) from an existing transmission line or designated corridor (see details in Section 3.2.5).

Through the ROD for the PEIS, the BLM may decide to carry forward some or all of the proposed SEZs as part of the agency's Solar Energy Program. Land use plans would be amended to identify the SEZs and adopt all applicable management requirements. Further, the Secretary of the Interior may decide to withdraw the public lands encompassed in the SEZs from potentially conflicting uses through the issuance of a Public Land Order (see Section 1.3.5, BLM Land Withdrawals).

1.3.7 BLM Planning Criteria

Planning criteria are the constraints, standards, and guidelines that determine what the BLM will or will not consider during its planning process. As such, they establish parameters and help focus the structure and preparation of the PEIS. The following are the planning criteria that were considered during preparation of the PEIS:

- The BLM will prepare RMP amendments in compliance with FLPMA, the ESA, the Clean Water Act (CWA), the Clean Air Act (CAA), NEPA, and all other applicable laws, E.O.s, and BLM management policies.

- The BLM will use the PEIS as the analytical basis for any decision it makes to amend these RMPs.

- The BLM will develop a reasonably foreseeable development scenario (RFDS) to predict future levels of development. It will identify lands available for utility-scale solar energy development, lands available for utility-scale solar energy development that have restrictive stipulations, and lands not available for utility-scale solar energy development in affected plans.

- The BLM will limit its amendment of these plans to utility-scale solar energy development and associated transmission issues and will not address the management of other resources, although the BLM will consider and analyze the impacts from increased use on other managed resource values.

- The BLM will continue to manage other resources in the affected planning areas under the pre-existing terms, conditions, and decisions in the applicable RMPs for those other resources.

- The BLM will recognize valid existing rights under the RMPs, as amended.

- The BLM will coordinate with federal, state, and local agencies, and Tribal governments in the PEIS and plan amendment process to strive for consistency with existing plans and policies, to the extent practicable.

- The BLM will coordinate with Tribal governments and provide strategies for the protection of recognized traditional uses in the PEIS and plan amendment process.

- The BLM will take into account appropriate protection and management of cultural and historic resources in the PEIS and plan amendment process and will engage in all required consultation.

- The BLM will recognize in the PEIS and plan amendments the special importance of public lands to people who live in communities surrounded by public lands and the importance of public lands to the nation as a whole.

- The BLM will make every effort to encourage public participation throughout the PEIS process.

- The BLM has the authority to develop protective management prescriptions for lands with wilderness characteristics within RMPs. As part of the public involvement process for land use planning, the BLM will consider public input regarding lands to be managed to maintain wilderness characteristics.

- Environmental protection and energy production are both desirable and necessary objectives of sound land management practices and are not to be considered mutually exclusive priorities.

- The BLM will consider and analyze relevant climate change impacts as part of the PEIS process, including the anticipated climate change benefits of solar energy.

1.3.8 BLM Requirements for Further Environmental Analysis

As discussed previously, the Solar PEIS will not eliminate the need for site-specific environmental review for future individual utility-scale solar energy development proposals (see Section 1.3.6.1, Programmatic Scope). The BLM will make separate decisions whether or not to authorize individual solar energy projects in conformance with the existing land use plan(s) as amended by the Solar PEIS. Site-specific environmental reviews for utility-scale solar energy projects commenced after the ROD for the Solar PEIS is signed will be tiered to the Solar PEIS. All site-specific environmental reviews will include a requirement for additional project-specific public involvement. The BLM retains the discretion to reject solar ROW applications based on site-specific issues and concerns, even in those areas available or open for application in the existing land use plan.

In cases where a broad policy, plan, program, or project will later be translated into site-specific projects, subsequent analyses are referred to as "tiered" analyses. Tiering refers to the coverage of general matters in a broader EIS (such as national program or policy statements) with subsequent narrower EISs or environmental assessments (EAs) (such as regional program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the EIS or EA subsequently prepared (40 CFR 1508.28).

Tiering will typically result in a more efficient environmental analysis process for future solar energy development proposals. Since the BLM has completed in-depth environmental analyses for the proposed SEZs as part of the PEIS (see Section 1.3.6.2, Proposed Solar Energy Zone Scope), it is expected that projects proposed in SEZs would require limited additional environmental review. The determination of the necessary level of additional NEPA analysis, however, would be made on a case-by-case basis at the time a solar energy project application was received.

The proposed Solar Energy Program will establish specific policies and requirements regarding the approval of future utility-scale solar energy projects on BLM-administered lands. These policies and requirements are itemized in Appendix A.

1.4 DOE REQUIREMENTS AND OBJECTIVES FOR THE PEIS

Different offices within DOE address different aspects and/or approaches to the mission of solar power development. For example, one aspect of DOE's Office of Energy Efficiency and Renewable Energy (EERE) mission is to develop cost-competitive solar energy systems for the United States by providing technical assistance and funding for research. EERE's Solar Energy Technologies Program (Solar Program) is working to improve the efficiency and reduce the cost of solar technology through research, development, and demonstration in partnership with industry, universities, and national laboratories. The Solar Program also facilitates the deployment of solar technology through resource assessment; development of codes and standards; market and policy analysis; and by providing technical information to national, state, and local entities. DOE is also evaluating its sites around the country for suitability for various renewable energy technologies, including solar. As another example, the Solar Program and DOE's National Nuclear Security Administration (NNSA) have proposed a solar demonstration project at the Nevada National Security Site (previously named the Nevada Test Site), to demonstrate the technical and commercial potential of advanced concentrating solar power and concentrating photovoltaic technologies and systems. In addition, NNSA is evaluating a generic commercial solar power installation in the draft Nevada National Security Site Site-Wide Environmental Impact Statement (NNSS SWEIS; DOE/EIS-0426), which is scheduled for completion in 2012. In addition, DOE's Loan Guarantee Program provides financial support for the development of renewable energy projects, including solar energy projects, implemented at utility scales.

DOE's Western Area Power Administration (Western) markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states, including parts of the six-state study area for this PEIS. Western's Open Access Transmission Service Tariff provides open access to its transmission system. Western provides these services through an interconnection if there is available capacity on the transmission system, while protecting power deliveries to existing customers and transmission system reliability, and considering the applicant's objectives. With respect to new utility-scale solar energy facilities, any interconnection between such a facility and the Western transmission system would need to comply with Western's interconnection policies and environmental requirements and would require NEPA review in accordance with DOE's NEPA regulations.

While solar technologies generally are considered to be clean and sustainable, they can result in adverse direct and indirect impacts on the environment, especially utility-scale facilities. DOE is interested in exploring new ways to generate and store energy captured from the sun while minimizing the impacts of solar development on the environment and reducing the cost of solar energy development. DOE is committed to supporting the development of these and other solar and renewable energy projects in an environmentally responsible manner.

1.4.1 DOE's Purpose and Need

As discussed in Section 1.2, DOE is required to take actions to meet mandates under E.O.s 13212 and 13514, as well as Section 603 of the EISA. DOE's purpose and need is to satisfy both E.O.s and comply with congressional mandates to promote, expedite, and advance the production and transmission of environmentally sound energy resources, including renewable energy resources and, in particular, cost-competitive solar energy systems at the utility scale.

Specifically, DOE proposes to further integrate environmental considerations into its analysis and selection of solar projects that it will support. DOE will build on the BLM's analysis of potential impacts of utility-scale solar development on the environment for all phases of development (i.e. during site characterization, construction, operation, and decommissioning), and on the identified potential mitigation measures, to provide a technical basis for development of guidance. DOE would consider, as appropriate, the relevance of the analytical results for all lands, not just BLM-administered lands.

DOE would use this information to develop guidance for the development of solar energy projects. DOE's investment and deployment strategy would incorporate a decision-making framework of guidance for early consideration of sound environmental practices and potential mitigation measures for solar energy development. Development of a framework of guidance, based on the analyses of the PEIS, would give DOE the tools with which to make more informed, environmentally sound decisions at the outset, would help to streamline future environmental analysis and documentation for DOE-supported solar projects, and would support DOE's efforts to comprehensively (1) determine where to make technology and resource investments to minimize the environmental impacts of solar technologies, and (2) establish environmental mitigation recommendations for financial assistance recipients to consider in project plans when applying for DOE funding.

Western's purpose and need for participating in this PEIS is to identify potential transmission impacts and recommend mitigation measures for transmission lines associated with solar energy projects. Western anticipates using the transmission environmental impact and mitigation measures analysis in this PEIS to streamline its own NEPA documents once specific projects are identified and interconnection requests are filed with Western. With the PEIS providing the basis for this analysis, project-specific NEPA documentation for interconnections should be more concise and take less time to prepare, resulting in efficiencies for both Western and the project proponent.

Chapter 2 provides a more detailed discussion of DOE's proposed action and descriptions of alternatives.

1.4.2 DOE's Decisions To Be Made

On the basis of the analysis of this PEIS, DOE could implement new strategies for funding solar projects that would emphasize the development of solar energy technologies that minimize environmental impacts, such as impacts on water use and land use. In addition, DOE would develop guidance that all projects receiving support from DOE would use, as appropriate, a consistent set of mitigation measures as developed and identified on the basis of the impact analyses in this PEIS.

At this time, Western does not anticipate making any specific decisions at the programmatic level on the basis of the analysis in this PEIS. It anticipates using the analyses of transmission development to more expeditiously prepare project-specific NEPA documents and expedite decisions regarding future interconnection requests related to solar energy development and other energy development in the six-state study area.

1.4.3 DOE's Scope of the Analysis

The geographic scope of applicability for DOE's proposed guidance that would be developed on the basis of analyses in this PEIS, includes both BLM-administered lands and other lands. DOE may support solar projects within SEZs identified by the BLM; on other BLM-administered lands; or on other federal, state, Tribal, or private lands. Similarly, Western may be involved in associated transmission development on lands administered by any of these entities.

The scope of the impact analysis includes an assessment of the environmental, social, and economic impacts of utility-scale solar facilities and required transmission connections from these facilities to the existing electricity transmission grid. As discussed in Section 1.2, viable solar technologies to be deployed over the next 20 years include parabolic trough, power tower, dish engine systems, and PV. These technologies are discussed in greater detail in Section 3.1.

1.5 COOPERATING AGENCIES

The BLM and DOE are lead agencies jointly preparing this PEIS. Because the scope of the PEIS is of interest to numerous federal, state, Tribal, and local agencies, several agencies expressed an interest in participating as cooperating agencies. The entities listed below are cooperating in the preparation of this PEIS, and Memoranda of Understanding (MOUs) between these agencies and the DOE and/or the BLM have been established, as appropriate. The cooperating agencies were given the opportunity to review the PEIS prior to release of the public draft.

The following agencies are participating as cooperating agencies in the preparation of this PEIS:

- U.S. Department of Defense (DoD);
- U.S. Bureau of Reclamation (BOR);
- U.S. Fish and Wildlife Service (USFWS);
- U.S. National Park Service (NPS);
- U.S. Environmental Protection Agency (EPA), Region 9;
- U.S. Army Corps of Engineers (USACE), South Pacific Division;
- State of Arizona Game and Fish Department (AZGFD);
- State of California, California Energy Commission (CEC);
- State of California Public Utilities Commission (CPUC);
- State of Nevada Department of Wildlife (NDOW);
- N-4 Grazing Board, Nevada;
- State of Utah Public Lands Policy Coordination Office;
- Clark County (Nevada), including Clark County Department of Aviation;
- Dona Ana County (New Mexico);
- Esmeralda County (Nevada);
- Eureka County (Nevada);
- Lincoln County (Nevada);
- Nye County (Nevada); and
- Saguache County (Colorado).

In addition, the State of California has established an Interagency Working Group on the Solar Energy Development PEIS as a means of facilitating and coordinating federal, state, and county agency participation in the PEIS process for the state. The CEC is coordinating this working group. Members of the California Interagency Working Group include all of the federal agencies that are participating as cooperators as well as several State of California agencies

(including the Native American Heritage Commission, Office of Planning and Research, Department of Parks and Recreation, State Lands Commission, and Department of Fish and Game), and Inyo and San Bernardino Counties.

1.6 RELATIONSHIP OF THE BLM'S PROPOSED PROGRAM AND DOE'S PROPOSED STRATEGY TO OTHER PROGRAMS, POLICIES, AND PLANS

1.6.1 Renewable Portfolio Standards and Other Regional and State Initiatives

Some interstate and state initiatives have been created whose mission is to facilitate renewable energy development. This is partially in response to the passage of Renewable Portfolio Standards (RPSs) requiring that a certain percentage of a state's electricity capacity requirements be supplied from renewable sources (e.g., solar, wind, geothermal, or biomass) by a given year. The six states in the PEIS study area all have RPSs; Table 1.6-1 gives the specific requirements for each state along with information about other state initiatives.

The Western Governors' Association and DOE launched the Western Renewable Energy Zones (WREZ) initiative in May 2008, with DOE providing substantial funding. The WREZ initiative, which encompasses the Western Interconnection region, seeks to identify those areas in the West with vast renewable resources to expedite the development and delivery of renewable energy to where it is needed.[7] The scope of the WREZ initiative includes solar, wind, biomass, geothermal, and hydropower resources. The initiative is intended to facilitate the construction of renewable energy facilities and expansion of the electricity transmission system needed to deliver the energy to load centers across the Western Interconnection (WGA and DOE 2009).

The state-level and WGA initiatives are discussed in more detail in Appendix D. The appendix includes maps showing how designations from these initiatives relate to the BLM's proposed designations for solar energy development.

1.6.2 Related Initiatives

There are many ongoing and recently completed efforts addressing how best to enable environmentally responsible renewable energy development and its associated transmission needs in the Western United States. Examples of those initiatives are identified below; others are presented in Appendix D of this document. All demonstrate, to some degree, the challenges in identifying appropriate areas for renewable energy and transmission and underscore the importance of collaboration among agencies and stakeholders.

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[7] The Western Interconnection is the name of the electricity grid, overseen by the Western Electricity Coordinating Council, that serves the states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming; part of west Texas; the Canadian provinces of Alberta and British Columbia; and a small portion of northern Mexico in Baja California.

TABLE 1.6-1 RPS Requirements and Other State Initiatives in the Six-State Study Area[a]

State	RPS Requirements	Other State Renewable Energy Initiatives
Arizona	15% by 2025	Arizona Renewable Resource and Transmission Identification Subcommittee (ARRTIS 2009).
California	20% by 2010 and 33% by 2020[b]	Renewable Energy Transmission Initiative (RETI) (CEC 2010). Desert Renewable Energy Conservation Plan (DRECP)—to prioritize and streamline renewable energy projects in the Mojave and Colorado Desert Regions on the basis of renewable energy potential and plant and animal habitat protection.
Colorado	30% by 2020	Colorado's Renewable Energy Development Infrastructure (Colorado Governor's Energy Office 2007, 2009).
Nevada	25% by 2025[c]	Renewable Energy Transmission Access Advisory Committee (RETAAC) (State of Nevada 2007 and 2009).
New Mexico	20% by 2020[d]	New Mexico's Renewable Energy Transmission Authority (RETA; 2010).
Utah	20% by 2025[e]	Utah Renewable Energy Zone Task Force (Berry et al. 2009; State of Utah 2010).

[a] The RPS requirements are current as of July 2010 and were obtained from the Database of State Incentives for Renewables & Efficiency (North Carolina Solar Center and Interstate Renewable Energy Council [2010]).

[b] The 33% standard is a goal established in 2009 by Governor Schwarzenegger in E.O. S-21-09 and has not been adopted by law or regulation as a requirement.

[c] Includes a solar set-aside requiring 5% of the utilities' portfolios be from solar energy through 2015, and 6% per year beginning in 2016.

[d] Includes a solar set-aside requiring 20% of the utilities' portfolios be from solar energy by 2020.

[e] Utah's RPS is a voluntary standard.

1.6.2.1 Energy Corridor Designation

In accordance with Section 368 of the Energy Policy Act of 2005, DOE and the BLM worked with the U.S. Forest Service (USFS) and DoD to prepare the *Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States*, which evaluates issues associated with the designation of energy corridors on federal lands in 11 western states, including the 6 states included in this PEIS plus Idaho, Montana, Oregon, Washington, and Wyoming (DOE and DOI 2008). Energy corridors are land corridors in which energy transport facilities (e.g., electric transmission lines, natural gas pipelines) could be sited. On the basis of the West-wide Energy Corridor PEIS, the BLM and USFS have amended their respective land use plans to designate a series of energy corridors

across the western states. The lands identified in these amendments are within the planning areas that are included within the scope of this Solar PEIS.

The designation of energy corridors is likely to affect energy development throughout the western United States, including utility-scale solar energy development, because the siting of energy corridors will facilitate development by removing key restraints on development and construction of new electric transmission lines on federally managed lands. Information regarding the West-wide Energy Corridor PEIS (Corridor PEIS) is available at http://corridoreis.anl.gov. The development of transmission infrastructure will be a component of all solar energy projects. The Corridor PEIS provides standards and guidelines for transmission development that should make reviews and approvals of transmission projects located in established corridors more efficient.

1.6.2.2 Landscape Conservation Cooperatives and BLM's Proposed Landscape Approach

The DOI is establishing a national network of Landscape Conservation Cooperatives (LCCs). LCCs are management–science partnerships composed of private, state, and federal representatives who agree to establish a shared vision of landscape health and sustainability. The LCCs will facilitate collaboration, provide science-based information and tools needed for developing resource management strategies, and promote coordinated partnership actions at the landscape and local levels. The LCCs and the BLM's proposed landscape approach (discussed below) are complementary efforts that are anticipated to become more fully integrated as they progress.

The BLM's proposed landscape approach consists of five interconnected components that provide a framework for integrating science and management:

- Rapid Ecoregional Assessments (REAs);
- Ecoregional Direction;
- Field Implementation;
- Monitoring for Adaptive Management; and
- Science Integration.

REAs are currently underway for eight ecoregions. (For an explanation and maps of the ecoregions in the six-state study area, see Appendix I.) The REAs will synthesize existing information about resource conditions and trends within an ecoregion, highlight and map areas of high ecological value, and gauge their potential risk from climate change, wildfires, invasive species, energy development (including renewable energy), and urban growth. Ecoregional Direction will use the results of the REAs, with input from BLM staff, partner agencies, stakeholders, and tribes, to identify key management priorities for the public lands within an

ecoregion. Field Implementation will include the establishment of mitigation measures for authorized land uses, amending land use plans (where necessary), and monitoring.

Management priorities established through Ecoregional Direction, Field Implementation, and Adaptive Management components of the landscape approach may influence where and how solar energy is sited in the future, by identifying additional areas of low resource conflict where solar energy should be prioritized or areas from which solar energy development should be excluded. The Solar Energy Program is designed to adapt and conform to new management direction and land use plan amendments that result from REAs.

1.6.2.3 California Desert Renewable Energy Conservation Plan

In California, federal and state agencies (including the BLM) are cooperating on renewable energy development and have formed the Renewable Energy Action Team (REAT). In October 2009, a MOU between California Governor Schwarzenegger and Department of the Interior Secretary Salazar launched the Desert Renewable Energy Conservation Plan (DRECP) initiative. More information about the REAT is available on the CEC Web site (http://www.energy.ca.gov/33by2020/index.html); more information about the DRECP is available at http://www.drecp.org.

The DRECP is intended to advance state and federal natural resource conservation goals in the Mojave and Colorado desert regions of southern California, while also facilitating the timely and streamlined permitting of renewable energy projects. The DRECP will include a strategy that identifies and maps areas for renewable energy development and areas for long-term natural resource conservation. This initiative could result in amendments to BLM land use plans related to solar and other renewable energy development.

1.6.2.4 Arizona Restoration Design Energy Project

The BLM Arizona State Office is preparing an EIS to identify lands across the state of Arizona that may be suitable for the development of renewable energy. This initiative, called the Restoration Design Energy Project (RDEP), will focus on the reuse of previously developed or disturbed lands for renewable energy generation and other alternative land uses. The RDEP will build on the analyses in the Solar PEIS and could, through the land use plan amendment process, refine or prioritize additional areas in Arizona where solar energy development may occur. More information about the RDEP is available at http://www.blm.gov/az/st/en/prog/energy/arra_solar.html.

1.6.2.5 Wind Energy Development PEIS

On June 24, 2005, the BLM issued a Notice of Availability for its *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States, Including Proposed Amendments to Selected Land Use Plans*

(Wind PEIS) (BLM 2005b). This PEIS evaluated a program of policies and mitigation measures applicable to wind energy development on BLM-administered lands and included amendments for appropriate BLM land use plans. The wind energy development program implemented by the ROD for the Wind PEIS is similar to BLM's proposed program for solar energy development being developed under this PEIS. The Notice of Availability for the Wind PEIS ROD was published in Volume 71, page 1768 of the *Federal Register* (71 FR 1768) on January 11, 2006; information regarding the Wind Energy Programmatic EIS is available at http://windeis.anl.gov.

1.6.2.6 Geothermal PEIS

In October 2008, the BLM and USFS jointly issued the *Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States,* evaluating geothermal energy development in 12 western states, including Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming (BLM and USFS 2008). On December 17, 2008, the BLM signed a ROD to facilitate geothermal leasing of the federal mineral estate in these states. The decision (1) allocates BLM lands as open to be considered for geothermal leasing or closed for geothermal leasing and identifies those National Forest System lands that are legally open or closed to leasing; (2) develops a RFDS that indicates a potential for 12,210 MW of electrical generating capacity from 244 power plants by 2025, plus additional direct uses of geothermal resources; and (3) adopts stipulations, best management practices, and procedures for geothermal leasing and development. The BLM's ROD implemented these actions through amendments to 114 BLM land use plans. Information regarding the Geothermal Energy Programmatic EIS is available at http://www.blm.gov/wo/st/en/prog/energy/geothermal/geothermal_nationwide.html.

1.7 ORGANIZATION OF THE PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

This Draft PEIS consists of Chapters 1 through 16 and 14 appendices, listed below. To assist in navigating the document, a Reader's Guide has also been developed.

- Chapter 1 discusses the purpose and need for the agencies' actions; the scope of analysis; cooperating agencies, and the relationship of the proposed actions to other programs, policies, and plans.

- Chapter 2 describes the alternatives assessed in this PEIS. These alternatives present different options for the BLM's management of solar energy development on BLM-administered lands and for DOE's strategy for support of solar energy projects. The chapter includes discussions of the RFDS and describes alternatives considered but eliminated from further analysis in the PEIS.

- Chapter 3 presents information describing solar energy technologies and projects, including descriptions of typical activities conducted during each phase of development, regulatory requirements, health and safety aspects,

hazardous materials and waste management, transportation considerations, and relevant existing agency guidelines on impact mitigation. Information presented in this chapter is applicable to BLM's proposed Solar Energy Program, DOE's proposed strategy, and Western's future project-specific analyses.

- Chapter 4 provides a general description of the existing conditions and trends of resources and resource uses in the six-state study area that may be affected by implementing the BLM's and DOE's proposed alternatives. The description of the affected environment provides the basis for identifying potential impacts in sufficient detail to support the programmatic nature of the Solar PEIS. Information presented in this chapter also is applicable to Western's future project-specific analyses.

- Chapter 5 describes both potential impacts common to all types of utility-scale solar energy power production facilities as well as technology-specific impacts. Impacts from required transmission interconnections are also described. The chapter identifies programmatic level impact mitigation measures that the BLM evaluated in order to determine appropriate mitigation requirements for its proposed Solar Energy Program. Information presented in this chapter is applicable to Western's future project-specific analyses.

- Chapter 6 analyzes the potential impacts of BLM's alternatives described in Chapter 2. These analyses evaluate the effectiveness of the alternatives at meeting BLM's established program objectives and summarize the potential environmental consequences of the alternatives, including the expected cumulative impacts of solar energy development on BLM-administered lands and other NEPA considerations.

- Chapter 7 describes the potential impacts of DOE's alternatives described in Chapter 2, including cumulative impacts and other NEPA considerations. These analyses evaluate the effectiveness of the alternatives at facilitating and mitigating potential impacts from solar energy development supported by the DOE on BLM-administered lands and other federal, state, private, and Tribal lands.

- Chapters 8 through 13 present the affected environment and impact assessment (including cumulative impacts) for solar energy development in SEZs proposed in Arizona, California, Colorado, Nevada, New Mexico, and Utah, respectively. These chapters also identify SEZ-specific mitigation measures, where appropriate, that would be implemented in addition to the programmatic level mitigation measures identified in Chapter 5.

- Chapter 14 describes the consultation and coordination activities conducted in the course of this PEIS, including public scoping, government-to-government consultation, coordination with BLM state and field offices, and interagency

consultation and coordination. It also discusses the potential adoption of the program and strategy for solar energy development analyzed in the PEIS by other organizations, such as other federal agencies, Tribes, or other entities responsible for the approval of utility-scale solar energy projects.

- Chapters 15 and 16 provide the list of preparers and a glossary, respectively.

- Appendix A provides current and proposed program administration and authorization policies and required design features for BLM's Solar Energy Program. Section A.1 shows the current BLM Solar Energy Policies (BLM 2007; 2010a,b) in their entirety. Section A.2 outlines the BLM's proposed new solar program under both of its action alternatives, including policies and required design features.

- Appendix B provides a list of applications for ROWs for solar energy development received by the BLM through February 2010.

- Appendix C contains a list of each of the BLM land use plans that are proposed for amendment through this PEIS, the proposed changes, and the amount of land that would be available for ROW application.

- Appendix D gives a summary of the activities of other regional and state plans and programs related to solar energy development and/or transmission planning, including maps showing how designations from some of these initiatives relate to BLM's proposed designations for solar energy development.

- Appendix E describes the methodologies that were used to construct the RFDS and to project the amount of solar power generation over the next 20 years.

- Appendix F provides an overview of solar energy technologies.

- Appendix G provides an analysis showing locations in the study area that have location-constrained transmission (i.e., locations that are greater than 25 mi [40 km] from existing transmission lines and/or designated energy transmission corridors).

- Appendix H contains information about federal and state regulations and statutes that may be applicable to solar energy development.

- Appendix I contains detailed descriptions of ecoregions in the six-state study area, state maps showing where the potentially developable solar resources occur within the ecoregions, and the land cover types and descriptions for the proposed SEZs.

- Appendix J provides information on federally listed species (i.e., species listed under the Endangered Species Act) and BLM-designated sensitive species that occur on BLM-administered lands that are included under the three alternatives considered in the PEIS. Information in the appendix includes listing status, suitable habitat types, and occurrence of these species in alternative areas.

- Appendix K documents consultation correspondence for the PEIS, including government-to-government consultation among the DOE, BLM, and Native American Tribes, and cultural resource consultations.

- Appendix L documents the data and methodology used for geographic information system (GIS) mapping in this PEIS.

- Appendix M presents the methodologies used in the PEIS for analysis of impacts on resources.

- Appendix N presents viewshed maps for four solar technology heights for each of the proposed SEZs.

1.8 REFERENCES

Note to Reader: This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this PEIS. It is likely that at the time of publication of this PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this PEIS.

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