# APPENDIX D:

# PROPOSED IDENTIFICATION PROTOCOL FOR NEW SOLAR ENERGY ZONES

*This page intentionally left blank.*

# CONTENTS

*This page intentionally left blank.*

# APPENDIX D:

# PROPOSED IDENTIFICATION PROTOCOL FOR NEW SOLAR ENERGY ZONES

The solar energy zones (SEZs) being carried forward in this Supplement identify approximately 285,000 acres (1,153 $km^2$) across the 6-state study area. In addition, the U.S. Department of the Interior Bureau of Land Management (BLM) has made a commitment to continue processing pending applications. Although this is a strong start in facilitating utility-scale solar energy development on public lands, the BLM intends to identify new SEZs and/or expand existing SEZs on an as-needed basis. The BLM has already initiated efforts to identify new SEZs in the states of California, Arizona, Nevada, and Colorado through ongoing state-based efforts (see Section 2.2.2.2.6 of this Supplement for more information) and anticipates identifying new or expanded SEZs in the remaining states in the near future.

The BLM believes that having a workable process for identifying new SEZs is an essential element of its overall approach to solar energy development. The process must be open and transparent, with opportunities for substantial involvement of stakeholders including solar industry and transmission providers. This protocol establishes a process that would be undertaken at the state or field office level as an individual land use planning effort or as part of an ongoing land use plan revision. It is the BLM's goal to complete the work of identifying new SEZs and amending applicable land use plans within 12 to 18 months of initiating such effort.

New or expanded SEZs should be identified in the context of existing solar market conditions, existing and planned transmission systems, and new state or federal policies affecting the level and location of utility-scale solar energy development. The BLM, in conjunction with the states and the U.S. Department of Energy, will periodically review the need for additional public lands for solar development following the protocol outlined below.

This appendix to the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS) presents a step-by-step process for identifying new SEZs. The five steps in the process, outlined in the following sections, are as follows:

1. Assess the need for new SEZs,
2. Establish technical and economic feasibility criteria,
3. Apply environmental screening criteria,
4. Consider other factors, and
5. Analyze proposed SEZs through a planning and National Environmental Policy Act (NEPA) process.

## D.1 ASSESS THE NEED FOR NEW SEZS

Assessment of the need for new or expanded SEZs will take place a minimum of every 5 years in each of the 6 states covered by the Solar PEIS. The assessment of need may take place as part of the regular land use planning process or as a separate effort. BLM State Offices will be

responsible for overseeing the assessment of SEZs and for making the determination that additional acreage is needed following appropriate stakeholder outreach. Acknowledging that significant changes can occur in the interim between required assessments of need, the BLM will also provide for an assessment triggered by a petition process.

Petitions for reassessing the need for new or expanded SEZs must be submitted in writing to the appropriate BLM State Director with documentation supporting the request. Petitions must have a rational basis and should be linked to factors such as policy and/or market changes (e.g., increase in state or national renewable standards or approval of a foundational transmission line). Developers, environmental stakeholders, local and state governments, and/or industry associations may collectively or individually petition the BLM to consider specific areas for new or expanded SEZs based on market interest or other relevant considerations. Petitioners may also request changes in already identified SEZs, such as eliminating or revising boundaries due to changes in status of species or critical habitat under the Endangered Species Act (ESA). In addition to the petition process, the public may also raise the need for new, expanded, or modified SEZs through the land use planning scoping process.

When considering the need for new or expanded SEZs, the BLM will rely on outside expert consultation regarding electricity demands, markets, and renewable energy policies. Utility-approved plans, state public utility commissioners, and regional planning entities such as the California Independent System Operator and the Western Energy Coordinating Council can all provide useful inputs into the BLM's determination of needed additional acreage to meet renewable generation goals. The BLM will take into consideration policy goals and trends in the solar market. The BLM will consider the availability of land in existing SEZs when it evaluates the need for new or expanded SEZs. The BLM's assessment of need should also establish as necessary new state-based Reasonably Foreseeable Development Scenarios that incorporate any new federal or state policies affecting projections.

## D.2 ESTABLISH TECHNICAL AND ECONOMIC FEASIBILITY CRITERIA

In addition to considering the amount of renewable energy needed across a state or region, the BLM's assessment will take into account technological advances in solar energy generation systems, identify where new energy is going to be needed and at what levels, and specify any existing constraints. These additional factors will influence not only whether new or expanded SEZs are needed but also where they should logically be located, considering transmission, load, and solar resources and their configuration in terms of size and terrain.

A number of factors determine the technical and economic suitability of an area for utility-scale solar energy development, including the quality of the solar resource, terrain, and proximity to existing load and infrastructure. These factors may vary by state and/or region and will continue to evolve over time. As part of its SEZ identification process, the BLM will work with outside experts and stakeholders to establish the following technical and economic suitability criteria.

### D.2.1 Size Threshold

An SEZ should generally encompass an area of 5,000 acres (20.2 $km^2$) or more, so that the supporting infrastructure can be shared by multiple facilities. Smaller areas, particularly areas near existing and available transmission infrastructure, may be suitable for solar facilities. Smaller areas of public lands adjacent to private, state, or other federal lands suitable for solar development may also be useful as SEZs, particularly in conjunction with the adjacent areas. In general, however, SEZs on public lands should be large enough to generate substantial quantities of solar-generated power in order to justify the effort and expense required to determine whether a specific area is well suited for solar development.

### D.2.2 Solar Insolation Level

Solar insolation levels in SEZs should be high, thus allowing for optimum power production. Under BLM's proposed Solar Energy Program, a minimum direct normal solar insolation level of 6.5 kWh/$m^2$/day is required for BLM-administered lands to be available for utility-scale solar development. Although locations with insolation values lower than 6.5 kWh/$m^2$/day would appear less economically viable given current technologies, it may be appropriate to select and establish new SEZs in areas with lower insolation levels, if the areas are otherwise well suited for development and provide for economically viable projects.

Higher insolation values provide significant benefits for solar generation facilities. For instance, a reduction of 1 kWh/$m^2$/day in insolation is equivalent to approximately a 10% reduction in efficiency and, in turn, a proportional increase in costs and land use footprint (due to the need for additional solar collection equipment to provide the same quantity of energy). Different types of insolation are most relevant to the different large-scale solar generating technologies. For concentrating solar technologies, direct normal insolation is most pertinent, while for photovoltaic (PV) systems, global tilt insolation is the appropriate measure of the solar resource. As part of the process to identify new SEZs, the BLM should consider both the direct normal insolation and the global tilt insolation.

### D.2.3 Slope Threshold

Most solar generating technologies must be sited on relatively flat ground to ensure that the solar collectors can utilize the solar resource effectively. Depending on the technology, the required slope can range from less than 2% to more than 5%, although lower slopes are generally better for siting solar generation. Under BLM's proposed Solar Energy Program, slopes of less than 5% are required for BLM-administered lands to be available for utility-scale solar development. In the selection of new SEZs on BLM-administered lands, some flexibility in applying the slope criterion may be appropriate, particularly for PV or dish engine technologies that are more tolerant of lands with steeper slopes, if the area is otherwise well suited for development and provides for economically viable projects. It is unlikely that lands with slopes of greater than 10% would be technically viable for utility-scale solar production.

### D.2.4 Load Areas To Be Served

When considering the appropriate locations for new SEZs, the BLM will determine the load areas likely to be served by needed new solar generation. The BLM should rely on outside expert consultation regarding electricity demands, markets, and renewable energy policies. The BLM should also consider policy goals and trends in the solar market. For example, it could be that the Renewable Portfolio Standard in a given state has been met (e.g., Nevada) and new solar development is expected to serve demand in an adjacent state (e.g., California). In this example the logical location for new SEZs may be in proximity to existing transmission close to the border of the adjacent state.

### D.2.5 Infrastructure Access

As part of the identification of new or expanded SEZs, the BLM will consider proximity to existing infrastructure, such as transmission lines, utility corridors, and roads. Where SEZs can be located close to existing infrastructure, environmental disturbance may be minimized through use of the existing facilities (in some cases, however, transmission lines may be sited in environmentally sensitive areas that are not suitable for locating SEZs). Use of existing infrastructure may also reduce costs of construction and mitigation, making locations close to existing and utilizable infrastructure attractive to developers.

For initial consideration of a potential SEZ location, the existing and proposed transmission lines serving the area should be cataloged in relation to the potential power generation from the proposed SEZ location. The BLM should then consult with state and regional transmission planning and coordination authorities, state energy offices, and transmission system operators to evaluate available capacity on the existing and proposed lines and to determine whether transmission access issues might create barriers to development in a specific area. Where new transmission lines are needed, they should be planned to utilize existing rights-of-way (ROWs) or designated utility corridors if possible. To formalize transmission-related goals and objectives for new SEZs, the BLM may find it appropriate to enter into a Memorandum of Understanding with appropriate transmission planners and providers.

It is important to note that efforts to assess the feasibility and cost of supplying transmission to a specific area have a high degree of uncertainty, because new transmission lines are proposed, constructed, and added to the existing transmission grid over time and because the available capacity on the grid also changes as demand increases and new power sources are added over time. Due to the remote locations of many prime solar resource areas, transmission upgrades and additions will generally be needed to connect those locations to the grid. SEZs should be located in areas where it will be feasible and cost-effective to connect new power sources to the grid.

The ability to utilize existing paved roads for access to SEZs can also reduce impacts associated with development; therefore, SEZs should be located adjacent to major paved roads where possible. For potential SEZs where existing paved roads are located some distance away,

existing dirt roads should be upgraded for site access to the greatest extent possible in order to minimize land disturbance.

## D.3 APPLY ENVIRONMENTAL SCREENING CRITERIA

### D.3.1 Program Exclusion Criteria

The BLM will apply program exclusion criteria established through the Solar PEIS to lands that meet the established technical and economic feasibility criteria described above.

BLM-administered lands off-limits to utility-scale solar energy development include lands prohibited by law, regulation, presidential proclamation, or executive order (e.g., lands in the National Landscape Conservation System). As part of the Draft Solar PEIS, the BLM identified additional categories of lands that are known or believed to be unsuitable for utility-scale solar development. The BLM's proposed Solar Energy Program identifies these lands as exclusion areas for utility-scale solar energy development ROWs. The categories of lands that have been proposed as exclusion areas for utility-scale solar energy development ROWs have been updated as part of this Supplement and are described in Section 2.2.2.1.

### D.3.2 Application of Relevant Land Use Plan Decisions

State and field offices undertaking efforts to identify new or expanded SEZs should apply all relevant decisions in existing land use plans (e.g., ROW avoidance and exclusion areas, timing restrictions, and so forth).

### D.3.3 Additional Locally Relevant Screening Criteria

State and field offices undertaking efforts to identify new or expanded SEZs may choose to identify and apply additional screening criteria based on local conditions and institutional knowledge in consultation with other local, state, and federal authorities and Tribes.

The BLM should use landscape-scale ecological assessments to identify, and exclude from SEZs, areas of high ecological value or importance (e.g., BLM's rapid ecological assessment, California's Desert Renewable Energy Conservation Plan [DRECP], The Nature Conservancy's eco-regional assessments, and Crucial Habitat Assessment Tools being developed pursuant to the Western Governors Wildlife Council "Wildlife Corridors Initiative"). For example, in areas with pre-existing landscape-scale conservation plans, such as the DRECP in California, future SEZs will not be considered in areas needed to achieve biological goals and objectives established in the plan. Other types of areas to screen for based on landscape-scale information may include areas with significant populations of sensitive, rare, and special status species or unique plant communities, important biological connectivity areas for special status species, designated wildlife habitat management areas, and areas with high concentrations of

ethno-botanical resources of importance for Native American use. Potential landscape-scale effects of development should be evaluated through consultation with relevant federal, state, and local resource management agencies and Tribes.

To identify additional locally relevant screening criteria, the BLM will undertake consultation with appropriate land management agencies for consideration of areas close to special designations such as the National Parks, National Refuges, and National Forests. Such consultation may result in agreements not to locate SEZs near specific units, based on an agency's assessment of potential adverse impacts on those units.

As its environmental analysis for individual solar ROW applications on public lands continues, the BLM is expanding its knowledge of areas not suitable for development. Areas eliminated from ROW applications due to resource conflicts (e.g., rare vegetation or desert washes) may provide additional screening criteria for SEZs.

## D.4 CONSIDER OTHER FACTORS

### D.4.1 Identify Disturbed or Previously Disturbed Sites

As part of its SEZ identification process, the BLM will identify disturbed or previously disturbed sites that may be suitable for new SEZs. Examples include, but are not limited to, the following:

- Lands that have been mechanically disturbed or degraded;

- Lands that have been "type-converted" from native vegetation through plowing, bulldozing, or other mechanical impact, often in support of agriculture or other land cover change activities (e.g., mining, clearance for development, or heavy off-road vehicle use);

- Brownfields and other contaminated or previously contaminated sites identified by the Environmental Protection Agency's RE-Powering America's Land Initiative (http://www.epa.gov/renewableenergyland/); and

- Idle or underutilized industrial sites.

Sources of information will include, but are not limited to, the BLM's landscape-scale ecological assessments, which identify converted or highly degraded lands on BLM-administered and adjacent federal and nonfederal lands.

### D.4.2 Identify Opportunities To Combine Other Federal and Nonfederal Lands

As part of the SEZ identification process, the BLM will take into account opportunities to partner with adjacent federal and nonfederal landowners (e.g., private, state, Tribal, or

U.S. Department of Defense-withdrawn lands). For example, SEZs may be located on public lands of comparatively low resource value or small size situated adjacent to degraded and affected private lands. This combination of BLM-administered and nonfederal lands could allow for a combined use area, allowing for the expansion of renewable energy development onto well-suited adjacent lands.

## D.5 ANALYZE PROPOSED SEZS THROUGH A PLANNING AND NEPA PROCESS

Upon the completion of the preliminary steps outlined above, the BLM will publish a Notice of Intent (NOI) in the *Federal Register* stating its intent to prepare a Land Use Plan amendment(s) to identify new or expanded SEZ(s) and prepare the associated NEPA documentation. The NOI will also begin the formal scoping process (40 CFR 1501.7). Through the scoping process, the BLM will solicit input on the technical and economic suitability criteria, locally relevant screening criteria, disturbed and previously disturbed lands and opportunities for federal–nonfederal partnerships. Based on scoping, the BLM will identify potential SEZs to be analyzed through the planning and NEPA process. The public will also be invited to nominate proposed SEZs that meet the objectives of the planning effort through the scoping process. The BLM will document the results of its scoping in a publicly available scoping report (43 CFR 1610.2(d)).

When the BLM is preparing environmental impact statements (EISs) for new SEZs, its goal will be to produce documents with comprehensive analyses of resources within the proposed SEZ at a level of detail sufficient to allow for tiering of future solar projects within the SEZ. The potential impacts associated with the development of transmission interconnection and other infrastructure to support the establishment of an SEZ will be considered as part of the NEPA review for the SEZ. Analysis of SEZs will also include appropriate consultations pursuant to the ESA and the National Historic Preservation Act. The BLM will make the draft land use plan amendment and draft EIS available for a 90-day public comment period (43 CFR 1610.2(e)). The final EIS and Record of Decision will amend affected land use plans.

Through the planning and NEPA process, the BLM will refine and evaluate proposed SEZs based on resource-specific considerations. Chapter 5 of the Draft Solar PEIS includes a comprehensive description of the impacts of solar energy development and possible mitigation measures in the categories below. This information will be used as a guide to inform the analysis of SEZs.

- Lands and Realty
- Specially Designated Areas and Lands with Wilderness Characteristics
- Livestock Grazing
- Wild Horses and Burros
- Wildland Fire

- Recreation
- Military and Civilian Aviation
- Geologic Setting and Soil Resources
- Minerals
- Water Resources
- Ecological Resources
- Vegetation and Plant Communities
- Wildlife
- Aquatic Biota
- Special Status Species
- Air Quality and Climate
- Visual Resources
- Acoustic Environment
- Paleontological Resources
- Cultural Resources and Native American Concerns
- Socioeconomics
- Environmental Justice
- Cumulative Impact Considerations

While establishing SEZ boundaries that avoid sensitive resources is generally the most effective means of ensuring resource protection, complete avoidance of all sensitive resources is not always possible. Depending on the size of a proposed new SEZ and the location of resources within an SEZ, it may be practical to include some areas within the boundaries of an SEZ, with requirements that no disturbance occur in these areas (i.e., solar facilities would be required to be constructed outside of such areas). Inclusion of sensitive areas within an SEZ would in practice allow the BLM to identify a block of land for solar energy development, instead of fragmented land pieces.

Design features and/or mitigation measures may also be effective in minimizing potential resource impacts in new SEZs. In the future the BLM would require implementing the design features of its Solar Energy Program (currently described in Appendix A of the Draft Solar PEIS) in new SEZs. These design features would adequately mitigate many resource-specific impacts that could be associated with solar development. The BLM will identify and analyze additional design features and/or mitigation measures particular to new SEZs as necessary through its planning and NEPA processes. The BLM will also develop regional mitigation plans for SEZs to the extent practicable to more effectively facilitate future development.

*This page intentionally left blank.*