DOCKET
09-AFC-6
DATE DEC 23 2009
RECD. JAN 12 2010

CNRCC DESERT COMMITTEE

December 23, 2009

Holly Roberts
BLM - Palm Springs-South Coast Field Office
1201 Bird Center Drive, Palm Springs, California 92262

Alan Solomon
Mike Monasmith
Project Managers, Siting, Transmission and Environmental Protection Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814

VIA FAX [letter only] to BLM and EMAIL TO: CAPSSolarPalen@blm.gov; CAPSSolarBlythe@blm.gov; CAPSSolarNextEraFPL@blm.gov; Mmonasmi@energy.state.ca.us ; asolomon@energy.state.ca.us

RE: Scoping comments for the Chevron-Solar Millenium Palen and Blythe solar projects and the Nextera (FPL) Genesis solar project

Dear Ms Roberts, Mr. Solomon and Mr. Monasmith:

These comments are being submitted on behalf of the California/Nevada Desert Energy Committee of Sierra Club. Most of the comments apply to all three projects; where noted, the comments are project-specific.

CONTEXT

The three projects under consideration by CEC and BLM traverse the eastern Riverside County portion of the Sonoran Desert of California. Currently, except for Interstate 10, a utility corridor, Wiley Well prison, small clusters of development at Desert Center, and a recovering Kaiser open pit mine, the open desert between Indio and Blythe in Riverside County is remarkably intact. That condition is proposed for stark change by many thousands of acres of renewable energy projects.

Neither the Bureau of Land Management CDCA Plan nor the NECO Plan Amendment contemplated industrialization on the vast scale and intensity now proposed for

the project area and environs. Without adequate guidance for limits of acceptable change, BLM must not approve projects which individually or cumulatively may foreclose future options for biological, cultural, water and other resource protection.

The only real disturbance limit under BLM's Northern and Eastern Colorado Desert Plan Amendment (NECO) is 1% of desert tortoise designated critical habitat. For an example of the type of disturbance contemplated by NECO, it called out grazing as a critical concern. But grazing impacts pale by comparison to the thousands of acres of renewable energy projects proposed to be closed to the public, acting as barriers to wildlife movement, and subject to long-term type conversion and loss of cultural resources. Not to mention industrialization of an otherwise intact landscape, with associated visual, growth inducing, air quality, urbanizing and other impacts.

It is fair to say that both BLM is under mandates to facilitate development of renewable energy and that solar energy is considered a mainstay of renewable energy strategies. Likewise so is the California Energy Commission. However, the extent to which solar development should rely on remotely located large-scale desert projects remains to be determined. While utilities prefer these large-scale transmission-dependent projects from which they derive guaranteed return on investment, environmental and consumer considerations may prove "less is more." Especially in the state of California, distributed photovoltaic generation is rapidly becoming more economically competitive as well as environmentally benign. (please see attached scoping comments on the California Desert Renewable Energy Conservation Plan, including attachments)

Additionally, the environmental review for these projects should consider federal legislation recently introduced by Senator Feinstein which would extend deadlines for projects wishing to qualify for stimulus funds. This legislation would also incentivize aggregation and development of disturbed private lands for renewable energy. Such federal legislation would relieve public agencies from current pressure to quickly approve the so-called "fast track" projects.

CONSENSUS RECOMMENDATIONS

What level of renewable development is appropriate for this portion of the Sonoran Desert? What level is appropriate both in terms of the carrying capacity of the biological, cultural, scenic and other resources of the area, and in terms of its appropriate share of state and federal renewable energy objectives? These are the big unanswered questions that must be answered prior to approval of projects with significant unmitigated impacts.

Clearly, until the solar PEIS and state DRECP (or equivalent ecosystem scale planning) is complete, the environmental review for these projects is occurring in a planning void. Therefore, law and policy mandate that responsible agencies act very

conservatively and approve only those projects and alternatives that do not foreclose future conservation options and that do little or no harm during this interim period.

That being said, portions of east Riverside County were called out as having potential for being appropriate for development of solar energy in a consensus criteria and mapping effort among environmental organizations (see attachments to DRECP comments). However, the focus of the consensus effort was to direct solar development primarily to disturbed lands and secondarily to consider conjunctive use of private lands with undisturbed public lands adjacent to them. However, in the three instant projects, in spite of having private "inholdings" and/or adjacent private disturbed lands, the applicants have failed to take advantage of conjunctive use. This is a fundamentally different approach than that recommended by major conservation organizations.

PURPOSE AND NEED AND PROJECT ALTERNATIVES

The DEIS must provide feasible project alternatives that would avoid significant impacts, particularly significant impacts to biological and cultural resources. Here is where the project's statement of purpose and need come into play. The FSA/DEIS project description may not be defined so narrowly that it forecloses feasible alternatives. Feasible alternatives may include a reduced, yet viable, project, or a project on an alternative site.

The purpose and need statements in the FSA/DEIS must address the true nature of the project without simply adopting the applicant's purpose. To be constrained by the proponent's power purchase agreement or other third party consideration would simply be pre-decisional. The responsible agencies have a duty to consider the need to protect public land resources including increasingly scarce intact habitat, at-risk species, ecosystem viability, cultural resources and the like. Renewable energy projects are just one element of a national climate change mitigation strategy to reduce greenhouse gas emissions. Several state, national, and international climate change reports describing climate change adaptation strategies underline the importance of protecting intact wild lands and associated wildlife corridors as a priority adaptation strategy measure.

The FSA/DEIS must address risks associated with global climate change in the broader context. This includes both the need for climate change mitigation strategies and the need for climate change adaptation strategies, especially conserving intact swathes of habitat and the landscape level corridors needed to connect them. Sensitive habitat loss and fragmentation, loss of connectivity for terrestrial wildlife, loss of wildlife and plant water sources, introduction of predator and invasive weed species potentially associated with the proposed projects must be avoided in order to be consistent with an effective climate change adaptation

strategy.

As an example of an inappropriate statement of purpose, take the Genesis statement:

- "To develop a site with close proximity to transmission infrastructure in order to minimize environmental impacts." Close proximity? The gen tie is 6 miles long.
- "To develop a site with available water resources to allow wet cooling in order to optimize power generation efficiency and reduce project cost." What about environmental cost of down- drafting the aquifer?
- "The Project will help meet the need for additional energy supply, a need based on the steadily growing annual demand of the California energy market. California load growth is expected to average 1000 megawatts (MW) per year over the next five years." But the California load is down several percent this year.

The responsible agencies have an affirmative obligation to ensure that there is a reasonable and fact-based purpose and need statement. They may not allow an applicant's preferred narrow purpose and need statement to dictate the size or location of the project or whether or not it consumes excessive amounts of groundwater, and so on. To do so would be pre-decisional and would undermine a fair and full review of alternatives that could avoid significant impacts of the proposed project.

Equally important is a robust alternatives analysis. Because the alternatives analysis is the "heart" of an adequate environmental review, the failure to provide meaningful alternatives is fatal an FSA/DEIS. Further it is entirely appropriate for portions of an application that are not approved for development to be designated for exclusion from future ROWs, and we urge the BLM to do so.

MITIGATION

First, the FSA/DEIS must undertake a rigorous analysis to determine which portion of the application, if any, is appropriate for the proposed exclusive industrial use of public lands to the exclusion of all other uses. Then, for any portion deemed suitable for such use, there must be full and feasible mitigation specific to each identified impact.

For instance, the FSA/DEIS must identify and analyze the importance of alluvial fan habitat to multiple species and the effect of the structural loss of habitat on this alluvial fan/bajada on the remaining habitat in the area. After requiring avoidance to the maximum extent feasible, the DEIS must demonstrate that proposed

mitigation actually provides for compensatory mitigation for each species of rare or sensitive plant and animal, including listed species, as well as kit fox, burrowing owl, nesting bird species, badger, and Nelson bighorn sheep, as well as each sensitive habitat type.

CUMULATIVE AND GROWTH INDUCING IMPACTS

The FSA/DEIS needs to adequately identify and analyze both the cumulative impacts and the growth inducing impacts, which in these cases are closely tied together. While review of applications has just begun for solar projects along the I-10 corridor, clearly the Devers to Palo Verde 2 (now called Devers to Colorado River) and the Blythe transmission projects will facilitate development of solar projects in the area. Will these projects embrace existing urbanized and disturbed lands, in effect re-developing marginal and abandoned ag lands with some moderate expansion into public lands? Or will these projects occur on isolated public lands failing to use existing disturbed or degraded lands, and therefore significantly exacerbate existing and foreseeable cumulative impacts and urban sprawl?

In analyzing cumulative impacts to special status plants, the FSA/DEIS should analyze impacts across the range of these species as well as ways to avoid and minimize these impacts. If avoidance is infeasible, mitigation must ensure that the loss of the individual plants and the cumulative impacts from those losses will in fact be adequately compensated for each species impacted.

The scope of the cumulative impacts analysis should encompass the Sonoran/ transition desert areas of the California desert at a minimum. Additionally, the cumulative impacts analysis should address species migration needs that may be caused by global climate change, and should ensure broad landscape level corridors needed to accommodate the uncertainties involved in forecasting species' migration. Not only migration needs, but also ecological processes, such as sand flow to and from dunes, need to be addressed.

Some reasonably foreseeable projects in the vicinity include all the solar and wind applications along I-10, Solar Reserve at Rice, transmission projects, new substations, various wind projects to the south, housing around Blythe and Desert Center, Desert Center racetrack, Eagle Crest pump storage, possibly Eagle Mountain landfill, and the Paradise Valley project. Farther afield, but harboring many species potentially dependent on migrating across the I-10 due to climate change, are projects in Imperial County such as the Mesquite landfill, various mines, OHV areas, plus proposed solar, geothermal and wind development in Imperial County.

GENERAL

Adequacy of data

Proponents assert that biological surveys were done using lists and protocol from FWS and CDFG. It is unclear as to how many years of surveys were conducted for each project. Apparently there were no fall plant surveys, but some supplemental studies done. It appears that what surveys were performed were focused and not adequate to locate new species, narrow endemics, and late blooming species. Please see comments on DRECP for discussion of the potential for narrow endemics to occur on these large tracts. Especially the lack of fall surveys may under-represent the full suite of rare plant taxa potentially occurring on site. These need to be done on all project sites. Botanical surveys should be deemed inadequate until additional surveys are conducted in late summer and fall in a year with adequate summer rainfall.

Without adequate surveys an accurate accounting of impacts to rare plants on site is not complete. It would be a violation of environmental laws to constrain the timeframe for project review and approval be so it does not provide for adequate data collection and analysis or adequate public review and input prior to decision.

End of project life

The agencies must require conceptual reclamation plans, bonding for project decommissioning, reclamation and long term monitoring after the end of the project life. However, if there still exists a demand for massive remote power generation at that time, then allowing for re-use of the site would be preferable to opening up new undisturbed lands for development in the future.

Visual resources

BLM is required to address impacts to baseline, but this area has not been categorized. We understand that the solar PEIS may be undertaking that now. Until the area is categorized, the BLM should avoid impacting visually sensitive areas, such as wildernesses.

Thresholds of significance.

Without the guidance of an overall plan, it is difficult if not impossible to determine appropriate thresholds of significance for impacts; hence the need to err on the side of caution. In any case, in the interim the agencies cannot legally permit unnecessary and undue degradation in their approvals.

Soils

Damage to intact desert soils and the resulting increased siltation during flooding and dust must be adequately analyzed in the DEIS. For example, off-site impacts from silt washed down through the site during flood events and the impacts of those events on habitat for desert tortoise and rare plants must be fully examined, avoided, minimized, and mitigated. Naturally, also, impacts to crypto-biotic crust are of great concern.

Noise

The application for certification noise report only considered human sensitive receptors. However, the dry cooling process is extremely noisy and the FSA/DEIS must consider impacts of noise and vibration on wildlife, which are equally if not more sensitive to noise than are humans. See also: http://aeinews.org/archives/573

CULTURAL RESOURCES

The following questions must be answered in the environmental review.

Has a 100% archaeological inventory has been done pursuant to Section 106 of the National Historic Preservation Act and BLM's manual 8100? If so, what was the result of the inventory? What was the spacing of crew (supposed to be 15 meters or less). What archaeological sites were located? In what area were they located? How old are the sites (eg from what timeframe, Pre Clovis (meaning older than 12,000 years), Paleo Indian, Archaic, Late Prehistoric, Historic?)

Have the archeological sites been evaluated for against the National Register of Historic Places criteria? Has the State Office of Historic Preservation concurred with the recommendations? If not, when will they be given an opportunity to review the reports and the findings/recommendations? Has the Advisory Council on Historic Preservation been asked to become involved in the projects and what was their response? The BLM must provide documentation (letter or email) of the above.

How has consultation with Indians occurred? What did the Indians tell the agency? Is there a Traditional Cultural Property that has been identified or might have been identified? Has consultation been completed? What has the California Native American Heritage Commission said regarding who should be contacted and whether there are sacred sites in the vicinity?

Levels of mitigation required by the agencies should depend upon the resource, preferably total data recovery which would include public style information. Mitigation should include excavation, more mapping, and compensation such as buying like resources for replacement values. If ancient shoreline resources are to be impacted, then mitigation should include acquiring and preserving extant shoreline sites of or equal or greater value.

PROJECT -SPECIFIC COMMENTS

NEXTERA GENESIS (FORD DRY LAKE)

The Genesis project site may be the least appropriate of the three solar projects currently being scoped in Riverside County. It is isolated from transmission, or any development for that matter. It has a linear footprint, posing more of a threat to wildlife movement than would a compact polygon. It is also sited immediately adjacent to designated wilderness and on the upper shoreline of an ancient lake.

Regarding onsite cultural resources, Ford Dry Lake has suffered significant impact over the decades from OHV activity. Its buried shoreline component is unknown but it is apparent from the cultural resources work done to date that there are potential subsurface archeological and paleontological resources of unknown age, extent and value on this site. Assuming it contains buried deposits under the shorelines it is critical to have a "Treatment Plan" or an Historic Preservation Plan to deal with sites discovered during project construction. These resources could have significant interpretive value if they pertain to the Archaic period in the area, about which there is much to learn. Please also see comments on cultural resource treatment, above.

The project should be pulled back from dunes and other sensitive areas onsite, or preferably moved to an alternative site closer to existing disturbance and transmission. Nextera's Beacon project is appropriate from a siting standpoint.

Regarding groundwater impacts, the applicant's hydrologist makes the assertion that local wildlife waters are fed by a perched aquifer, and that since the project proposes extracting groundwater at depth, there would be little or no impact on wildlife waters. We feel this assertion needs to be fully investigated in the FSA/ DEIS, especially since there are other new consumptive uses proposed in the same groundwater basin. Has the basin been adequately described to ensure that there is no communication between the perched and the deeper aquifer? Even just washing mirrors for these projects consumes hundreds of acre-feet of water a year, far more than equivalent wattage of PV.

The report also contends that the groundwater is brackish, diminishing its value. We are unconvinced that since the groundwater is brackish that diminishes its value; many plant species are adapted to brackish water, and it has value for wildlife as well. The DEIS must address the groundwater issue thoroughly.

CHEVRON-SOLAR MILLENIUM BLYTHE

Rather than developing on the periphery of the degraded private lands to the south and east, the proposed Blythe project footprint intrudes into bajadas with extensive washes and microphyll woodland. The responsible agencies should require an alternative eliminating all major drainages and the western half or more of the project. The Blythe application is well positioned to expand east and south onto disturbed lands, yet apparently the applicant has failed to put any serious effort into doing so. Moving the project out of the western and northern portion of the proposed footprint, and into adjacent degraded areas, would reduce project impacts and potentially retain the potential for a few 250MW units.

In any event, the agencies are obliged to prevent significant impacts until they have adequate guidance under the DRECP/Solar PEIS. And they are not obliged to guarantee any particular amount of acreage or power generation to any developer. Arguably this project can go forward with just one 250 MW unit, or half that, judging from the Genesis proposal to ramp up with independent 125 MW units. To avoid significant impacts to microphyll woodland, desert tortoise, kit fox and other resources, the Blythe project needs to be contained within the southeastern portion of its proposed footprint. It can and should expand further to the south and east onto private land if additional acreage is desired.

CHEVRON-SOLAR MILLENIUM PALEN

The Palen project as proposed has conflicts with the NECO tortoise movement corridor connection from the Chuckwalla DWMA. Additionally, it impacts sensitive dune habitat. At a minimum, the project should be reconfigured to avoid these sensitive areas and allow a sufficient width corridor to assure long-term tortoise movement north to south.

Cultural issues remain unresolved, especially since the project appears to impinge on ancient shoreline areas of Palen Dry Lake. This project is proposed adjacent to the Palen Lake ACEC which is loaded with archaeological sites dating to the late Paleo_Indian period and early Archaic time frame. The resources of the ACEC and those of Sidewinder Well would be impacted by the proposal because the ACEC boundaries were arbitrary, using section lines and features to define them, instead of resources. The Palen area appears to have a large number of sites on and off the shoreline. The shoreline of Palen Dry Lake is riddled with artifacts on its eastern shore. The artifacts are probably associated with the lake when it was filled with fresh water, which was long term at the end of the Pleistocene (about 12,000 years ago) and episodically during the 12,000-5,000 year ago time period. Springs/wells may have attracted Indians until the mid 1800s and pioneers during that later period also. The DEIS should seek to avoid impacts and should treat cultural concerns as outlined earlier in this letter.

The proposed project footprint also includes critical tortoise habitat on south, closer to the freeway. We note the project proposes to trans-locate tortoises to nearby habitat, but high attrition rates for translocation makes this of questionable use. Either onsite critical habitat should be avoided, or if not considered viable due to combined edge effects of the freeway and the project, loss of this habitat must be mitigated at a 5:1 ratio in more viable tortoise habitat in the same recovery unit, in addition to translocation with attendant monitoring.

The project proponent has failed to take advantage of conjunctive public/private land use as recommended above. The BLM should limit the footprint of the project to avoid sensitive onsite resources, and should do so without regard for the applicant's stated purpose, which is too narrow to meet NEPA intent. For instance, the applicant requests two 250 MW phases. But there is no magic to 250MW; turbines are not ordinarily bought off the shelf like a suit of clothes. The nearby Genesis project, with similar solar trough technology, is proposing two independent 125 MW projects. The FSA/ DEIS must analyze a reasonable range of feasible alternatives, and 125 MW units appear to be well within reasonable parameters. This site has opportunities for conjunctive land use with private land, and it is up to the applicant to be flexible in sizing the units in order to utilize the opportunities available.

Thank you for the opportunity to comment.

Very truly yours,

Joan Taylor

Joan Taylor, Chair
California/Nevada Desert Energy Committee

Enclosures [also by email, separate messages]

CNRCC DESERT COMMITTEE

December 21, 2009

ATTN: DRECP

BLM California State Office

2800 Cottage Way, Suite W-1623

Sacramento, California 95825

BY EMAIL AND FAX (Attachments by email only)

Re: Scoping, Desert Renewable Energy Conservation Plan (DRECP)

Ladies and Gentlemen:

These comments are submitted on behalf of the California/Nevada Desert Committee of the Sierra Club.

Landscape level protection

The DEIS must not limit its analysis only to special status species. A million acres of BLM land in the California desert is under application for renewable energy development. Even if only a fraction of these applications move forward, the biota of the California desert will be forever impacted by direct, indirect and cumulative impacts of renewable development. Species already listed will be further imperiled and species that are now considered robust will become threatened. Thus, in addition to analyzing special status species, NEPA mandates that the DEIS address impacts to all known species in the DRECP so as to assure ecosystem level protection.

Additionally, global climate change and resulting drought will put enormous pressure on species which are adapted to current rainfall and temperature regimes. Not just species, but very likely whole ecosystems will migrate. The DEIS needs to address this probable phenomenon and plan to preserve large landscape-level migration areas.

It has become evident that some of these multi-square mile applications for solar or wind development not only support populations of sensitive, threatened and endangered plants, but in fact support narrow endemic species heretofore unknown. This fact has come to light during recent surveys on large tracts of land in the desert, with many species detectable primarily in the fall season (personal communication Jim Andre). It is incumbent on the responsible agencies to thoroughly address this issue in the DEIS.

And, of course, botanical surveys should be comprehensive throughout areas proposed for development and conservation and should be conducted in the fall as well as the spring in order to capture all plant life.

Review of technologies as they affect demand for "Big Solar"

As a first step, the DEIS should determine the amount of peaking solar power plus intermittent wind energy that can be efficiently and cost-effectively utilized by the California grid, and what mix of distributed PV, wind energy and transmission dependent "Big Solar" best fits with forecast demand in 2020. In light of recent cost reductions and likely future advances in PV (advances not only in efficiency but also in band width) it would be a disservice to the public and ratepayers to dedicate sensitive desert resources to industrialization or to prematurely fund expensive new transmission improvements prematurely based on over-reliance on large scale solar projects. (see attached testimony and data from Bill Powers) Also, incorporated by reference are comments on RETI, which should be part of the CEC flies on the DRECP.

The DEIS may not rely on industry-sponsored initiatives to perform this analysis, but must perform its own independent and objective assessment of the appropriate mix of renewable technologies that best serve the public and the effect it will have on the need for large scale solar in the desert.

The results of the above study should inform the size of renewable energy zones contemplated and the phasing of their development under the DRECP.

Focusing and phasing renewable development

Given the significant threats to desert ecosystems, as well as significant unknowns with regard to how much large-scale transmission-dependent solar energy is a wise investment, a primary goal of the DRECP should be "first, do no harm." The DEIS should consider a preferred alternative wherein solar (and wind where suitable class winds occur) development is focused first on lands which clearly have lower resource value due to fragmentation, type conversion, edge effects, and other

factors. Such lands include fallowed or marginal ag land, disturbed military lands, Owens Lake dust project lands, or lands adjacent to existing substations and other lands with diminished resource values. As commented earlier in hearings, we believe it is essential that the Department of Conservation immediately update its maps of farmland in desert areas to reflect current conditions and inform this alternative.

As part of the preferred alternative, a subsequent phase would be to consider conjunctive use of disturbed private land combined with adjacent lower value federal land, rather than siting renewable development entirely on isolated natural public land. Coordination of the DRECP with local and regional "solar parks" could be considered as part of this preferred alternative as appropriate.

Only after such low-impact courses of action are exhausted should solar development be permitted to proceed outward onto natural desert public land.

Per provisions of the California Desert Protection Act, the State will eventually trade out many of its isolated sections for federal lands elsewhere in the desert and the state that are determined appropriate for multiple use. Presumably some of the land received in exchange will be suitable for renewable energy development; this scenario should be addressed in the alternatives.

One area of potentially high renewable energy value is the "dust project" area of Owens Lake, under the jurisdiction of the State Lands Commission. Whether this development is permitted under a local HCP or the DRECP remains to be seen. In any event, the responsible agencies should support the ongoing efforts of local conservationists to work with LADWP to craft a solution that both facilitates reasonable solar development to abate dust on one part of the Lake, and in turn assures water and conservation in perpetuity for rehabilitated portions of the Lake. The same applies to any renewable development that is contemplated in Owens Valley itself; although clearly the Owens Valley is more sensitive biologically, visually and otherwise and is therefore less appropriate for development than is the dust project portion of Owens Lake.

General comments

In its cumulative impacts analysis, the DEIS must consider all types of development and other impacts that are reasonably foreseeable in and around the DRECP boundary: solar, wind, geothermal, roads, transit, housing, ORV use, military maneuvers, other development and climate change.

In its noise (and vibration) analysis, the DEIS should consider wildlife as equally sensitive receptors, if not more so, than people. Additionally, the DEIS should analyze the "strobe" effect of windmills on wildlife.

The DEIS must undertake its own independent analysis of resource values of the various renewable energy zones under consideration without relying on others' rankings. In particular, the analysis should not use RETI's environmental scores for Competitive Renewable Energy Zones (CREZ) as a basis for ranking areas as suitable or unsuitable for renewable energy development, even on a relative basis. A case in point is that RETI ranked the Iron Mountain CREZ as having lower environmental sensitivity than Fairmont CREZ (Antelope Valley) in stark contrast to the vast majority of environmental organizations which broadly oppose developing Iron Mountain and favor development in Fairmont (Antelope Valley). (RETI chart, Wilderness Society et al comments to Solar PEIS, consensus map, attached)

Large-scale renewable development should be prohibited outside the zones eventually designated for such use. The responsible agencies should require banking of mitigation lands prior to allowing disturbance in renewable energy zones, and mitigation should be predicated on no net loss of habitat. Areas set aside as conservation areas should be protected in perpetuity with no allowable disturbance.

Notwithstanding the obligation to require bonding for reclamation of public land at the end of the life of the project, the DEIS should consider requiring re-use of abandoned sites for future renewable energy projects (if in fact such sites are needed in the future) in lieu of allowing development on other, undisturbed lands.

Finally, there is little if any mention of the real reason for developing renewables, namely to reduce greenhouse gas emissions from fossil fuel burning power plants, especially coal. Since it appears that renewables, particularly solar, will mainly supply peaking power, there is a possibility that without adequate planning there will be no displacement of base load power supplied by coal. What is the point in sacrificing the desert if there will not be a significant decrease in greenhouse gas emissions as a direct result?

Although the MOU talks about preserving species and biodiversity while at the same time developing 10,000 megawatts of renewable power there is no indication of just how the agency will go about this. No mention of using degraded lands, considering what the private sector will do on private land or what role imported renewable

power will play in meeting the goal. The DEIS must not rest its analysis on generalities with no real specifics. It must consider all potential contributors to renewable energy development and determine what role public lands should reasonably play.

The Conservation Actions list includes habitat restoration, enhancement, creation, adaptive management, monitoring, surveys, and research; and maintenance. It should include land acquisition and acceptance of conservation easements in perpetuity.

Additionally, the DEIS should not assume that all this technology is completely scalable when there is little evidence that some of it (solar towers and Stirling engines) can be easily scaled up. Or that other unproven technology (molten salt for thermal storage) will prove efficient and reliable over time. If moving forward with one or more demonstration project proves to be in the best interest of the public and the environment, then this project should be limited in scope and location to avoid wasting the public's land and probably the public's funding as well.

These are all issues that requre a hard look in the DEIS. Thank you for the opportunity to comment.

Very truly yours,

Joan Taylor

Joan Taylor, Chair Calif/Nev Desert Energy Ctee

5

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SolarM60247.

Comment Date: September 14, 2009 17:53:28PM
Solar Energy Development PEIS
Comment ID: SolarM60247

First Name: Alex
Middle Initial:
Last Name: Daue
Organization: The Wilderness Society
Address: 1660 Wynkoop St., Suite 850
Address 2:
Address 3:
City: Denver
State: CO
Zip: 80202
Country: USA
Email: alex_daue@tws.org
Privacy Preference: Don't withhold name or address from public record
Attachment: TWS NRDC and partners commnets on BLM SESAs 09.14.09 (with exhibits).pdf

Comment Submitted:

Please accept and fully consider the attached comments on behalf of The Wilderness Society and the other organizations signed on to the document.

Thank you,
Alex Daue

The Wilderness Society ~ Natural Resources Defense Council
Defenders of Wildlife ~ Wild Utah Project ~ Center for Native Ecosystems
Western Resource Advocates ~ New Mexico Wilderness Alliance
Arizona Wilderness Coalition ~ Californians for Western Wilderness
National Wildlife Federation ~ California Native Plant Society
Wyoming Outdoor Council ~ Colorado Environmental Coalition
Great Old Broads for Wilderness ~ Soda Mountain Wilderness Council
California Wilderness Coalition ~ Desert Protective Council ~ Sierra Club
Southern Utah Wilderness Alliance ~ Mojave Desert Land Trust

September 14th, 2009

Delivered via electronic mail (with exhibits, through the project website) and U.S. mail (with exhibits and attachments)

Solar Energy PEIS – Solar Energy Study Areas
Argonne National Laboratory
9700 S. Cass Avenue
EVS/900
Argonne, IL 60439

Re: Scoping Comments on the Solar Energy Study Areas for the Solar PEIS

Please accept and fully consider these comments on behalf of The Wilderness Society, Natural Resources Defense Council, Defenders of Wildlife, Wild Utah Project, Center for Native Ecosystems, Western Resource Advocates, New Mexico Wilderness Alliance, Arizona Wilderness Coalition, Californians for Western Wilderness, National Wildlife Federation, California Native Plant Society, Wyoming Outdoor Council, Colorado Environmental Coalition, Great Old Broads for Wilderness, Soda Mountain Wilderness Council, California Wilderness Coalition, Desert Protective Council, Sierra Club, Southern Utah Wilderness Alliance, and the Mojave Desert Land Trust.

The mission of The Wilderness Society (TWS) is to protect wilderness and inspire Americans to care for our wild places. We have worked for more than 70 years to maintain the integrity of America's wilderness and public lands and ensure that land management practices are sustainable and based on sound science to ensure that the ecological integrity of the land is maintained. With more than half a million members and supporters nation-wide, TWS represents a diverse range of citizens.

Natural Resources Defense Council (NRDC) is a non-profit environmental organization with over 1.2 million members and online activists nationwide. NRDC uses law, science and the support of its members and activists to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things. NRDC has worked to protect wildlands and natural values on public lands and to promote pursuit of all cost-effective energy efficiency measures and sustainable energy development for many years.

We appreciate the opportunity to submit these comments to the Bureau of Land Management on the maps of proposed Solar Energy Study Areas (SESAs), supplementing the Programmatic Environmental Impact Statement (PEIS) for agency-wide solar energy programs and policy. We are submitting these comments today via email and also forwarding a copy with attachments to you separately.

It is clear that the nation's growing addiction to fossil fuels, coupled with the unprecedented threats brought about by global warming, imperil the integrity of our wildlands as never before. To sustain both our wildlands and our human communities, TWS, NRDC and the undersigned believe the nation must transition away from fossil fuels as quickly as possible. To do this, we must eliminate energy waste, moderate demand through energy efficiency, conservation, and demand-side management practices, and rapidly develop and deploy clean, renewable energy technologies, including at the utility-scale, while keeping habitats and ecological connectivity intact.

Our public lands harbor substantial wind, solar, and geothermal resources. Developing some of these resources will be important to creating a sustainable energy economy and combating climate change. Renewable resource development is not appropriate everywhere on the public lands, however, and development that does occur on the public lands must take place in a responsible manner. TWS, NRDC and the undersigned support such careful development of renewable energy and hope these comments will assist the BLM in achieving the goal set out in Secretarial Order 3258 of "identifying and prioritizing specific locations best suited for large-scale production of solar energy."

We have organized our comments into three sections: The first section addresses cross-cutting themes and issues that address key considerations for both SESAs and the broader Solar PEIS process, including structuring a solar energy program, coordination with other on-going related processes and the need for a long term vision for the energy and conservation needs of the West. The second section discusses the SESAs that have been proposed and alternatives. The third and final section discusses issues that will arise if the other "blue lands" identified on SESA maps were opened to solar development. Exhibits with detailed comments on the BLM's proposals in each of the six states encompassed by the Solar PEIS, including maps and GIS data where available, are also included, as well as an exhibit on cultural resources in the SESAs. Please note that not all groups signed on to these broader comments are signing on to the additional state-specific and cultural resources comments attached as exhibits, so we have specifically identified those groups that are specifically signing on at the beginning of each state-specific comment exhibit and the cultural resources exhibit (exhibits 6-12).

I. Cross-cutting issues relating to SESAs and Solar PEIS

a. Identifying the most suitable areas and focusing development in those areas before expanding development is a responsible approach to utility-scale solar development on the public lands.

We support BLM's commitment to develop clear and comprehensive guidelines for responsible solar energy development, identify lands appropriate for solar projects as open for development, and close all other lands to development as part of the Solar Energy PEIS. The release of proposed SESAs for public review and comment is an important next step showing the BLM's commitment to this approach and providing more detail on how it can be accomplished. We are encouraged by the BLM's statements that important screening criteria (including critical wildlife habitat, special management areas, and visual resources) have already been applied to SESAs. Further, establishing SESAs better enables a landscape-level analysis of solar development and associated transmission on public lands in the West.

As the SESAs are building on the information provided in BLM's original Notice of Intent for the Solar PEIS, these comments are also building on the issues we identified in our original

scoping comments, dated July 15, 2008, which are attached as Exhibit 1 and incorporated herein by reference.

We appreciate the opportunity to comment on the proposed SESAs before the release of the Draft PEIS. Conservation organizations, local jurisdictions, industry groups, and many other members of the public have valuable information that can inform identification of the most appropriate areas as SESAs on public lands, and incorporating this information into decision-making will help ensure the success of the PEIS in furthering renewable energy development on public lands while protecting the many sensitive resources and values on our public lands.

Recommendations: BLM should move forward with developing a comprehensive and robust PEIS for solar development that includes clear and comprehensive guidelines for responsible solar energy development, identifies lands appropriate for solar projects as open for development, and closes all other lands to development. Through comments received during the NEPA process, BLM should refine the SESAs to ensure that, when Solar Energy Zones (SEZ) are designated, they truly include only the most appropriate lands for solar development on public lands.

b. Areas in which solar power generation is not appropriate must be clearly identified.

Development of utility-scale solar power generation facilities will transform the lands upon which they are located and preclude most other uses. As noted by the BLM, other uses of these sites "are unlikely due to the intensive use of the site for PV [photovoltaic] or CSP [concentrating solar power] facility equipment." Instruction Memorandum (IM) No. 2007-097. This transformation can be expected to last for decades, and some impacts will likely be permanent and cannot be mitigated. Under these circumstances, it is clear that some areas are not appropriate for this kind of development and equally that, as part of its new solar program, the BLM must identify which those areas are.

We appreciate the BLM's commitment to avoiding the sensitive areas identified in the scoping notice, as well as requiring that the SESAs be near existing roads and existing or designated transmission routes.

We support the application of the criteria set out in the Notice of Availability (74 Fed.Reg. 31307-31308) for removing lands from consideration for SESAs. In addition, we reiterate the categories and considerations identified in our original scoping comments on the Solar PEIS (Exhibit 1). In particular, we note that the SESAs do not acknowledge the need to identify and exclude from consideration lands with wilderness characteristics that have not been previously inventoried. For instance, some of the resource management plans (RMPs) governing the lands within proposed SESAs have not completed re-inventories for wilderness characteristics. A similar approach is already being implemented in the context of transportation management, where the BLM is requiring evaluation of lands for their wilderness characteristics prior to making or changing designations for roads or motorized trails. *See*, IM No. 2009-132. The agency can conduct a similar analysis prior to designating lands to be prioritized for large-scale solar energy development.

Further, while we believe it is of primary importance that no SESA be placed directly in any of the types of areas identified by the BLM and in our previous comments, it is also important that solar energy facilities not infringe on the recreational enjoyment of certain types of areas

or otherwise interfere with their ecological functions or other special values. Units of the National Landscape Conservation System and other protected areas serve as important core areas that are part of larger ecosystems; migration corridors and other landscape-level values must be taken into account in analysis of the SESAs in the Draft PEIS.

Supplemental Recommendations: We support BLM's exclusion of the categories of lands listed in the scoping notice. BLM should analyze any potential impacts from SESAs sited immediately adjacent to these areas, propose measures to minimize and mitigate those impacts, and make any necessary adjustments to SESAs if impacts are determined to be unacceptable. Lands with wilderness characteristics must not be adversely impacted by the SESAs. The SESAs should not be sited in lands BLM is managing to protect wilderness characteristics. Further, areas that have not recently been inventoried for wilderness characteristics should be inventoried before being committed to SESAs. The BLM should specifically consider the significant new information encompassed by the wilderness inventories which were attached to our original scoping comments, as well as to a letter sent by TWS to BLM on May 22, 2009 recommending avoidance of these areas. The May 22, 2009 letter and attached GIS data are included with these scoping comments as Exhibit 2 (letter, GIS data and explanatory spreadsheet attached).

c. Maximize use of areas that are already degraded and near existing infrastructure.

In addition to avoiding ecologically-sensitive lands, we commend BLM for selecting SESAs based on proximity to existing roads and existing or designated transmission corridors. We also recommend that BLM obtain and incorporate information on lands that are already impaired and/or are slated for other development uses. Abandoned mines, developed oil and gas fields, fallow agricultural lands, undeveloped real estate parcels, and other brownfields, which are not being restored to ecological function, provide opportunities for solar energy development without loss of other uses and values. Such sites are often close to existing infrastructure, so these two criteria work well together.

The Arizona BLM is conducting a specific process to identify lands that are both suitable for renewable energy development and require remediation or do not have other high resource values. The Restoration Energy Design Project is seeking to identify lands such as:

- hazardous material sites;
- brownfields;
- abandoned mines;
- former landfills, mineral sites or gravel pits;
- sites damaged or disturbed to the extent that restoration potential is limited; and
- sites that otherwise have very limited productivity due to a disruption of natural processes.

The BLM could undertake a similar process in other states, both internally and by seeking information from industry and the public, to identify such lands for solar energy development. We have attached comments submitted on the Restoration Energy Design Project as Exhibit 3 to these comments and incorporate these for your consideration in incorporating suitable, degraded lands. As noted in our comments, the categories in use by the Arizona BLM could

also permit coordination with adjacent landowners, to establish coordinated management of lands so that there would be sufficient acreage to support large-scale solar energy development.

Recommendation: In addition to accepting information from the public regarding areas to be excluded, BLM should solicit and incorporate information on severely degraded lands and disturbed habitat that could be additional SESAs.

d. Areas outside designated solar energy zones should be closed to new applications and applicants should be encouraged to move into zones.

The Notice of Availability states that the SESAs are being evaluated "for the purpose of determining whether such areas should be designated as Solar Energy Zones" that are intended to be "specific locations determined best suited for large-scale production of solar energy." Once the SEZs are designated as "best suited" in the PEIS, the BLM should give full force to those designations by limiting applications to these areas.

As the BLM well knows, there are hundreds of applications pending for rights-of-way (ROWs) for solar projects.[1] At the outset, we would note the recommendations in our scoping comments (Exhibit 1) and also under consideration in pending legislation that the BLM evaluate changing to a leasing program for development of renewable energy on public lands and/or incorporating more robust conditions and competitive bidding for ROWs. We reiterate the importance of these considerations in addition to the following discussion on limiting development to SEZs designated through the PEIS process.

The sheer number of the pending ROW applications, in addition to the problematic locations and speculative nature of many of them, as well as the lack of a program to manage them, have generated alarm among public land users and elected officials while complicating the BLM's ability to proactively design a comprehensive, environmentally responsible solar program. Consequently, allowing continued filing and potential development of new applications outside SEZs *after* SEZs have been designated is inconsistent with the fundamental reason for designating such areas – i.e., to direct solar development to appropriate areas of the public lands. A BLM and/or Interior Department decision to establish a program that seeks to both authorize utility-scale solar development within SEZs identified in this PEIS process, while also continuing to permit development outside the SEZs, is certain to generate significant public opposition and controversy, and slow down the Obama Administration's efforts to speed production of renewable energy.

Instead, the solar energy program prescribed by the Solar PEIS should require BLM field offices to move quickly to affirmatively deny pending applications that are inconsistent with its terms, including in particular applications in areas that have been put off limits to solar development, such as Areas of Critical Environmental Concern (ACECs) and critical habitat for threatened and endangered species,[2] as well as applications whose proponents have not met

[1] According to the BLM, the total number of "active" pending applications is 158. Qs & As: BLM Solar Programmatic Environmental Impact Statement (PEIS), June 29, 2009, p. 8 (hereinafter "BLM Qs & As"). In addition to these "active" applications, there are also 39 pending applications that overlap with pre-existing applications, for which they are not considered "active" by BLM.

[2] If any exceptions to this rule are deemed necessary, they should be as tightly constrained as possible. E.g., the only companies excepted should be those which had not only completed all required studies but also had signed power purchase agreements in hand. And, rather than merely allow these companies to develop these wholly inappropriate areas, they should be given the opportunity to apply for land within a designated zone on a non-competitive basis.

other applicable requirements such as timely submission of adequate and complete plans of development.[3] In addition, the new program should close all lands outside SEZs to the filing of new applications; and we strongly urge BLM to deny all *pending* applications outside delineated SEZs – with the exception of projects (including "fast-track" projects[4]) which meet the criteria set out in this comment letter and our July 2008 comment letter (Exhibit 1, attached), and comply with all environmental laws and permitting regulations and have either begun scoping or for which the BLM has approved a Plan of Development as of this date.

Thus, a key result of the new solar program should be the immediate closure of all public lands outside of designated SEZs to solar development, once the PEIS is completed and the Record of Decision (ROD) is signed. This goal could be achieved through amending the land use plans in question to not only designate SEZs, but also to direct that only applications within SEZs will be processed for permitting until such time as additional or enlarged SEZs are designated. A major advantage of such an amendment would be that it would simultaneously deal with the problems of pending as well as future applications.

The BLM should also set out specific standards for designating new or additional SEZs, including a requirement for a determination of need for additional megawatts (MW) of production before additional designations are considered. Moreover, the BLM should make clear as part of its new program that proposed plan amendments that would designate or expand SEZs will not be accepted from individual project proponents. 43 C.F.R. § 1601.6-3(b) ("A resource management plan may be changed through amendment [which] is initiated by the need to consider … an applicant's proposed action…."). If expansion of existing SEZs and/or designation of new ones is permitted through the traditional RMP amendment process, the benefits of a pro-active comprehensive approach to management will be eroded, if not completely lost.

If BLM determines not to refuse to process all pending applications outside SEZs (whether through plan amendments or otherwise), it must limit processing of such applications as strictly as possible. For example, it should provide for processing of applications outside SEZs only for those companies which meet specific criteria as of a specified date, such as companies that have completed all required biological surveys and studies, have signed power purchase agreements in hand and have evidence of independent financing. Rather than merely allow companies that meet these criteria to develop in the places they have selected outside SEZs, the new program should give them the opportunity to apply for land within a designated SEZ on a non-competitive basis.

In addition, if the BLM decides not to deny all pending applications outside SEZs, the agency should develop a suite of incentives to use to encourage any remaining applicants as well as others to move into designated SEZs. Put another way, if the BLM does not reject all applications outside SEZs, it is critical that the new program make meaningful distinctions between its handling of applications which are in SEZs and those which are not. Ensuring that

---

[3] Some of the groups submitting these comments have previously indicated their support for this and other measures such as increased fees designed to handle existing applications.

[4] The American Recovery and Reinvestment Act of 2009 identified renewable energy development as a priority on federal lands, and is making stimulus funding available in the form of loan guarantees for a subset of BLM's solar, wind, and geothermal project applications. The BLM is tracking project applications that may be able to qualify for these funds. The agency has identified potential "fast-track" applications that are furthest along in their application process and have the best chance of beginning construction by the end of December 2010 - the deadline for stimulus funding.

processing of applications within SEZs will be easier and hopefully faster as the result of the PEIS is definitely one such incentive,[5] but others, such as prioritizing the processing of applications that have moved into designated SEZs should be explored in the PEIS and incorporated into the new program. Simultaneously, the BLM should emphasize that every project outside a SEZ will require a full EIS. While we believe that such incentives will help encourage solar developers to move into SEZs, we emphasize that standing alone they will not provide an adequate solution to the problem posed by existing and potential applications outside those areas. At a minimum, applications on excluded lands must be denied and lands outside SEZs must be closed to future applications.

Recommendations: The BLM should utilize the PEIS to develop an approach to pending applications that will ensure that solar development is permitted on public lands in the future only within designated SEZs. BLM should develop, preferably through an exclusion policy, resource management plan amendments or through the use of a robust set of incentives, a means to close lands outside of designated SEZs to solar applications (with the exception of projects (including "fast-track" projects) which meet the criteria set out in this comment letter and our July 2008 comment letter (Exhibit 1, attached), and comply with all environmental laws and permitting regulations and have either begun scoping or for which the BLM has approved a Plan of Development as of this date). The BLM should also set out specific standards for designating new or additional SEZs, including a requirement for a determination of need for additional MW of production before additional designations are considered.

e. Discourage the use of wet-cooled or other water-intensive technologies.

Water is a major concern in the arid regions of the West where the proposed SESAs are located and we urge the BLM to take a proactive approach to this issue in the PEIS.

Electric generation from solar (and other) thermal power plants is most efficient when a source of cooling – typically water – is available to remove waste heat from the thermal cycle.[6] Unfortunately, the SESAs that are the focus of the PEIS are located in arid areas where intense competition already exists between the use of limited supplies of water for urban areas, fossil fuel production and agriculture.[7] Permitting water-cooled production of energy from solar resources would add to that competition.[8] The BLM should explore ways to avoid these results in the PEIS, including the options identified below:

(1) *Adopt a policy which would discourage the use of wet-cooling for power plants*. Both California and Nevada have adopted such policies.[9] California's policy states that the

---

[5] *See, e.g.*, BLM Qs & As, p. 6.

[6] *See, e.g.*, Renewable Energy Transmission Initiative Phase 1B Final Report (January 2009), Chapter III – Environmental Assessment of Competitive Renewable Energy Zones, p. 3-3 (hereinafter "RETI Phase 1B Report").

[7] *See, e.g.*, Colorado River Project, River Report – Summer 2009, p. 8. *See also id*., pp. 4-5, 6.

[8] The amount of water used for wet cooling a power tower plant is about 500 gallons of water per MWh of electricity, similar to a typical coal or nuclear plant. U.S. Department of Energy, Report to Congress, "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation, p. 4 (hereinafter "DOE Report on Water Use") (accessible at http://www1.eere.energy.gov/solar/pdfs/csp_water_study.pdf). A water-cooled parabolic trough plant consumes about 800 gal/MWh, or about four times what a combined-cycle natural gas plant consumes. Id. Because wet-cooled plants are more efficient than dry-cooled, see text at note 6 supra, more land would be required to produce a given amount of energy.

[9] See, e.g., California Energy Commission 2003 Integrated Energy Policy Report.

Energy Commission "will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound'."[10] There is broad acceptance of this policy in California, including among the solar industry,[11] where alternatives considered to date have included use of brackish water as well as dry-cooling.[12] Although Arizona does not have an explicit policy, it has moved to strictly regulate water use in solar projects.[13]

(2) *Adopt a performance standard that specifies the amount of water that is acceptable per MW generated*. Rather than tie solar development to one specific technology (i.e., dry-cooling), such an option would allow for any technology that would meet the standard and could in fact result in technology improvements.[14]

(3) *Adopt a technology-forcing standard that would continue to elevate the bar regarding water use and, simultaneously, encourage the use of new, innovative technologies*. For an example, the Department of Energy's project selection criteria for renewable energy projects "seeks to give priority consideration to "new or significantly improve[d] technologies" that are not extensively used in the marketplace[15].

Recommendations: The PEIS should examine several options related to guidelines on water use, including those described above, so that the agency and the concerned public can see the tradeoffs involved in saving fresh water, on the one hand, and the additional land that would be necessary to produce a given amount of renewable energy, on the other.

f. Consultation with U.S. Fish and Wildlife Service is necessary at the programmatic level.

A programmatic Section 7 consultation on the Solar PEIS should be undertaken with the U.S. Fish and Wildlife Service (USFWS), as was done for the Wind PEIS. To the extent possible, this Section 7 consultation should also seek to provide project-level take coverage under the federal Endangered Species Act.

We believe that a consultation is legally required, and that the failure to consult could make the entire process legally vulnerable with potential attendant delays. The failure to commence a Section 7 consultation now will result in this key requirement being processed separately at a later date, rather than now. This will correspondingly delay the timeline for implementation of actual near-term projects.

---

[10] California Energy Commission, Preliminary Staff Assessment, Beacon Solar Energy Project, Application For Certification (08-AFC-2), Kern County (Posted April 1, 2009) (hereinafter "Beacon Staff Draft"), p. 4.9-5.

[11] See, e.g., RETI Phase 1B Report, p. 3-3, describing agreement of all RETI stakeholders, including solar generators, to the assumption, for RETI purposes, that dry-cooling would be used except when reclaimed water from communities of a certain size is available.

[12] In the case of the Beacon project, CEC analysis revealed that dry-cooling could "reduce … consumption of potable water by up to 97 percent." Beacon Staff Draft, p. 1-6. In addition, the analysis revealed that not only were both of these options economically feasible, but also that dry cooling might "actually result in lower project operating costs." Id., p. 4.9-48.

[13] *See* http://www.azwater.gov/AzDWR/WaterManagement/documents/SolarPowerPlantsSummaryFINALPublic.pdf

[14] For additional options, *see* DOE Report on Water Use, *supra*.

[15] "Federal Loan Guarantees for Projects That Employ Innovative Energy Efficiency, Renewable Energy, and Advanced Transmission and Distribution Technologies," Loan Guarantee Solicitation Announcement, July 29, 2009, pp. 35-36.

We understand that USFWS and BLM instead intend to undertake Section 7 consultations in connection with specific project proposals for which ROW applications have been filed. While some of these project-specific consultations will be pursued in parallel with the Solar PEIS effort, reducing the timeline to completion for those *particular* projects, complete reliance on those consultations alone has several disadvantages in comparison to consolidated consultation. First, project-level consultation biases siting decisions toward those sites for which applications have been filed, erasing some of the planning benefits of the Solar PEIS effort. Instead, as in the zone approach, BLM should take the lead and guide developers toward the optimum sites. Second, a single, consolidated Section 7 consultation is likely to be more efficient than multiple project-level processes. Third, such consolidation is likely to result in greater consistency across projects. Finally, a completed Section 7 consultation with incidental take coverage for particular sites will enhance the value of those sites for potential developers and maximize the return to the United States from a potential competitive process. As the BLM, USFWS, and California's Energy Commission and Department of Fish and Game have recognized, in general a programmatic consultation with a project-level component for high priority near-term sites will best serve the goal of developing BMPs "and other appropriate … guidelines to assist solar … developers with siting projects in environmentally suitable locations . . . ."[16]

Recommendations: BLM should undertake a programmatic Section 7 consultation with the Fish and Wildlife Service in parallel with the Solar PEIS in order to comply with NEPA requirements, maximize efficiency of environmental review, and maximize consistency in the application of Section 7 analysis to projects in SESAs.

g. Integrate BLM planning with other laws and required processes.

As indicated, to address the climate challenge (as well as to obtain other economic benefits), our nation needs to develop renewable energy and to develop it quickly. In general, we believe that one of the best ways to achieve this goal is to integrate the environmental and other review processes of relevant state and federal agencies so that they can be carried out simultaneously, rather than serially. Consolidating reviews required under different environmental laws can accelerate zone designations as well as project approvals without sacrificing environmental protections.

One of the main complaints about delays involving all extractive or exploitative activities on the public lands comes from the different environmental review processes that these activities must undergo. Consultation may be required under the Endangered Species Act, conformity review may be required under the Clean Air Act, cultural resource review may be required under the National Historic Preservation Act and, even in our deserts, wetlands review may be required under the Clean Water Act. At the present time, all of these reviews frequently happen separately from the NEPA process. One of the best ways to expedite ultimate approval of SEZs and projects is to process environmental reviews at the program and project levels in a single document, or if that is not possible to process them in parallel. In addition to shortening the timeline to implementation, unified or parallel processing can promote economies of scale,

[16] Memorandum of Understanding Between the California Department of Fish and Game, the California energy Commission, the Bureau of Land Management, and the U.S. Fish and Wildlife Service Regarding the Establishment of the California Renewable Energy Action Team, November 17, 2008, p. 2. Accessible at http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy.Par.76169.File.dat/RenewableEnergyMOU-CDFG-CEC-BLM-USFWS-Nov08.pdf

integrate cumulative and project-level analyses, and maximize flexibility in considering alternatives, among other benefits.

In 2002, the Western Governors' Association (WGA) developed a protocol with the federal government, including the Department of the Interior and the Council on Environmental Quality that provides for such a consolidated process (attached as Exhibit 4). Among other items, the protocol calls for establishment of a timeline for consolidated reviews as well as for agreements on data needs and methodologies. In California, the BLM has entered into an agreement with state agencies to prepare joint environmental reviews of renewable generation and transmission projects.

Recommendations: We urge the BLM to utilize the WGA protocol and the California experience to the maximum extent possible in preparing this PEIS and, in the future, in processing specific solar applications.

h. Coordinate PEIS with other processes.

It is critical that the BLM coordinate the Solar PEIS with ongoing processes that share the same overarching goal – i.e., facilitating the development of solar (and other renewable) resources in an environmentally responsible manner. We have identified three processes underway in which the BLM has been a participant, as well as several others in which BLM may be participating.. At least one of these has clearly been taken into account in delineating the SESAs.

(1) RETI

California's Renewable Energy Transmission Initiative (RETI) is a voluntary, multi-stakeholder consensus process begun about three years ago. Its goal is to plan for the lowest cost, environmentally and economically, renewable development and transmission needed to meet the state's ambitious Renewable Portfolio Standard (RPS) goals. To date, RETI has identified 30 competitive renewable energy zones (CREZ) and developed a conceptual transmission plan that could serve those zones. At least half of the RETI CREZ are located on public lands, mostly in the California Desert Conservation Area.

RETI's CREZ were based in large part on existing ROW applications, including all applications filed on BLM-administered lands as of 2008 – even though all participants in the process understood that not all pending applications would in fact be granted. Clearly the BLM has considered RETI CREZ in developing its proposed SESAs in California: in addition to saying so,[17] comparison of the two kinds of areas reveals substantial overlap. Because BLM used different criteria and took into account potential resource conflicts and other information not available to or used by RETI participants, the SESAs are smaller than CREZ and some CREZ are not represented at all. As a result, it appears at this time that less renewable energy will be available from public lands in California than RETI has assumed. While this result is entirely within BLM's prerogative as the steward of those lands, it is essential that agency officials make sure that RETI participants clearly understand the PEIS process, including its timeline and the options under consideration. Further, the intergovernmental coordination underway must be strengthened to ensure the state is an active participant in the federal process. It is equally essential that RETI participants be kept fully up to date as to milestones

[17] BLM Qs and As, p. 3.

and the results of the process so that they can plan on the basis of complete and accurate information.

(2) Desert Renewable Energy Conservation Plan

The BLM is also participating in another California process – the DRECP. A major effort is currently underway at the California Department of Fish and Game (CDFG) to prepare this plan as directed by Governor Schwarzenegger's November 2008 Executive Order. Although the DRECP will require an environmental impact report (EIR), under the California Environmental Quality Act, it is not proceeding on a parallel timetable with the Solar PEIS; it is a longer term effort. Still, if created as a state Natural Community Conservation Plan (NCCP) and coupled with a federal Habitat Conservation Plan (HCP), this plan could provide an appropriate framework for the kind of long-term blueprint that is needed for the California Desert Conservation Area. It could also inform processes on other public lands in other involved states as discussed below. Consequently, it is critically important that the two efforts be closely coordinated.

Coordination is particularly important in terms of the areas identified for development and the appropriate mitigation strategies for solar projects. If there are disagreements between BLM, CDFG, and/or other state (or federal) agencies regarding these key issues, they should be resolved at least tentatively in advance (subject of course to the legal obligations and discretion of each agency) and as promptly as possible. If these questions are not addressed early on, the alternative is an iterative process that could delay projects by years and require substantial revisions to early efforts to respond to later, potentially differing, regulatory processes.

At a minimum, the BLM needs to ensure that the PEIS process supports the work that CDFG is and will be doing in developing the DRECP. More concretely, the PEIS should provide information that can and should be used by CDFG in their CEQA document(s). For example, if possible, the PEIS should address state listed species such as the Mojave Ground Squirrel, and do so in a way consistent with the views of CDFG and the requirements for an NCCP. In order to facilitate CDFG's DRECP process, it would also be helpful for the PEIS to address CEQA related issues and CEQA standards of significance, to increase CDFG's ability to utilize the PEIS in its own CEQA process on the DRECP. Agreeing on such issues and subjects is covered in the WGA Protocol referenced above.

(3) WECC west-wide planning

BLM should be coordinating its solar efforts with transmission planning in the Western Interconnection. As BLM has recognized, transmission access is the key to unlocking and developing the West's best renewable energy resources, including solar. To ensure sufficient transmission access for areas identified in the EIS process to best develop large-scale solar generation, BLM should therefore be coordinating closely with the key transmission planning venues in the western United States.

At the regional level for the Western Interconnection, this includes the Western Electricity Coordinating Council's (WECC) Transmission Expansion Planning and Policy Committee (TEPPC). More detailed planning occurs at the subregional level and therefore BLM should also coordinate with the Southwest Area Transmission (SWAT) group (focused on Arizona, New Mexico and southern Nevada), the Colorado Coordinated Planning Group (Colorado and Wyoming) and the California Independent System Operator (CAISO) and related entities for

southern California. BLM should also coordinate with state-based transmission expansion processes including the Colorado Senate Bill 100 effort (transmission is being planned to CO solar areas) and the Nevada's Renewable Energy Transmission Access Advisory Committee as it has done with California's RETI process. Lastly, BLM should consult and coordinate with the region's major utilities on both the resource planning and transmission expansion components to ensure markets adequate transmission for solar energy.

(4) WGA Western Renewable Energy Zones Initiative and State Renewable Energy Planning Initiatives

The Western Renewable Energy Zones Initiative (WREZ) is a cooperative initiative between the WGA and the US Department of Energy. It is a project to address transmission barriers to increased renewable energy production in the West. WREZ intends to "generate (1) reliable information for use by decision-makers that supports the cost-effective and environmentally sensitive renewable energy development in specified zones, and (2) conceptual transmission plans for delivering that energy to load centers."[18] Importantly, the WREZ effort combines solar resource data from government and industry with lands, wildlife and natural resource information from state agencies and the conservation community.

Further, all of the states within the scope of this PEIS (including California with its RETI process), have initiatives to identify locations and provide incentives for renewable energy development and transmission:

- New Mexico's Renewable Energy Transmission Authority was created to "stimulate clean energy production and create high-paying jobs, capital investment and greater economic development in rural areas."[19]
- Colorado's Clean Energy Development Authority is directed to "facilitate the financing of renewable energy projects in Colorado."[20]
- Nevada's Renewable Energy Transmission Access Authority is tasked to "propose recommendations for improved access to the grid system by which renewable energy industries can set up and have market access in Nevada and neighboring states."[21]
- The Arizona Renewable Resource and Transmission Identification Subcommittee (ARRTIS) of the Renewable Transmission Task Force (RTTF) has "been developed to more specifically identify those areas in Arizona with the best potential for renewable generation project development. This resource information will be evaluated against specific constraint criteria including land ownership, sensitive lands, terrain and other factors that could influence the location of utility-scale generation facilities. The ARRTIS will then identify opportunities for future transmission corridors that would link these areas to the existing transmission system or to load pockets in the state."[22]
- Utah's Renewable Energy Zone Task Force was created "to promote the development of renewable energy resources to meet the goal of 20% of Utah's electricity by 2025." Specific objectives of the task force include the identification of renewable energy zones, identification of "policies or market mechanisms that would facilitate

[18] http://www.westgov.org/wga/initiatives/wrez/
[19] www.nmreta.org
[20] http://www.colorado.gov/energy/index.php?/utilities/category/clean-energy-development-authority/
[21] http://gov.state.nv.us/RETAAC-II/Members.htm
[22] http://www.westconnect.com/planning_swat_rttf_arrtis.php

transmission planning and permitting for renewable energy projects", and identification of the transmission necessary to bring renewable energy resources to market.[23]

The increased focus on renewable energy in this planning area also increases the importance of the WREZ process and the state-based process occurring in the six states involved in the Solar PEIS. Accordingly, the Solar PEIS should coordinate with these parallel efforts, and in particular, incorporate information and data when there is consensus reached between the environmental, renewable energy industry and utility and other stakeholders on zones/areas that are appropriate for large-scale solar energy development on public lands.

Recommendations: BLM should consistently and actively participate in all processes related to the development of renewable technologies on public lands including, but not limited to, the initiatives identified above in order to facilitate a two-way exchange of relevant learning and data. BLM should specifically coordinate with the WGA to incorporate information gathered in the WREZ process and share information produced in the development of the PEIS.

i. Geographic and temporal phasing of development should be evaluated.

The BLM's efforts to develop an environmentally responsible approach to managing solar generation on public lands implicates phasing in at least two respects: 1) geographically and 2) temporally. As discussed immediately below, both issues should be explored in the PEIS.

Geographic phasing: The SESAs identified by BLM involve three ecoregions: the Mojave, Sonoran and Central. The majority of acreage proposed in SESAs, Kilowatts, projects in SESAs and pending projects are located in the Mojave. While it may be tempting to designate SEZs only in that ecosystem, we urge the BLM instead to ensure that appropriate SEZs are designated and appropriate projects are approved in all three of these ecoregions. In this way, ecologically unique impacts of development can be identified and studied and the new knowledge incorporated into future decisions about development in each SEZ. In fact this information and knowledge is sorely needed given the lack of experience with utility scale projects. While there is a critical need to increase the generation and use of solar (and other renewable) energy to supplement even more urgently needed efforts at conservation and energy efficiency, it would be irresponsible not to learn as much as we can from these early stages of development.

Temporal phasing: It is essential that, as part of the new program, BLM field offices be directed to consider temporal phasing – i.e., phasing in projects. Consideration of such an approach is appropriate given that there is a lack of understanding of the on-the ground impacts of several solar technologies, both individually and cumulatively, as well as little experience with utility scale solar generally.

Under these circumstances, field offices should be directed to consider phasing in projects during the permitting process.[24] Such an approach may not be appropriate or feasible in all cases, but in those where it is – e.g., in cases where there are multiple power blocks or limited existing transmission capacity such that a new or upgraded line would be required for an entire proposed project – it should absolutely be explored. For instance, approving part of, rather

[23] www.energy.utah.gov/Renewable_Energy

[24] This recommendation is not intended to suggest that consideration of this option requires that field offices be given new authority. Rather it is intended to ensure that they use their existing authority to consider this option for reasons discussed above.

than all, of a many thousand acre proposal will help ensure that the impacts of the entire project can be better understood, avoided and mitigated.

Phasing is also appropriate given the likelihood that at least some permitted projects will not succeed for financial, technical or other reasons. Making approval of subsequent phases dependent on success of previous phases will help ensure that good sites are not tied up unnecessarily.[25]

Recommendations: The PEIS should explore and the final solar program should incorporate provisions designed to ensure that there are SEZs in all affected ecoregions in order to build knowledge and experience with solar technologies in those regions through geographic phasing. The PEIS and the new program should also incorporate temporal phasing of projects where appropriate and as practicable to address the lack of understanding of the on-the ground impacts of several solar technologies, both individually and cumulatively, as well the lack of experience with utility scale solar generally. Such an approach will accomplish the dual purposes of allowing BLM to identify unforeseen impacts and develop strategies for mitigating them as well as ensuring that areas that are appropriate for development are not tied up unnecessarily.

j. BLM should compare and prioritize SESAs for development.

As part of the process of studying these SESAs and ultimately delineating solar development SEZs, the BLM should engage in a careful comparison and ranking of SESAs on the basis of their environmental suitability for development. This is not the same as comparing the alternatives that will be considered in the PEIS. Rather, it involves the development of criteria for use in assessing the relative environmental harms as well as benefits that will likely attend the designation of each area under consideration for solar development and then the application of those criteria to those lands. Such a comparison is critical to enabling the public to understand the tradeoffs inherent in developing one area over another. The ranking component of this exercise is essential to allow the BLM to determine which SESAs to designate as SEZs. Public understanding of both these sets of information is key to maximizing public support for the final SEZ decisions. More specifically, the public needs this kind of information to be able to conclude that the lands chosen for development are, in fact, more appropriate than lands that were not so chosen.

The criteria that should be used for such a task include, for example, relative access to transmission infrastructure, likelihood of public acceptance of designation,[26] number of projects proposed for development, and megawatt potential, as well as more traditional environmental indicators such as the presence or absence of federal and state-listed species, acreage of disturbed land – i.e., land that has been subjected to mechanical treatment –, and proximity to protected lands.

---

[25] To further the objective of preventing good sites from being "locked up," we also support strong due diligence requirements, including a five year review with benchmarks for progress, and prompt termination of project/ROW approval in the event of inadequate progress or failure as stated in our original scoping comments.

[26] In California, the task of applying this suggested criterion is made easier by the document entitled "Renewable Siting Criteria for California Desert Conservation Area" that was previously submitted to the Bureau by a large group of environmentalists and desert activists in that state.

Recommendations: The BLM should compare the relative impacts of the SESAs to each other in order to assess which areas are likely to have the least environmental impacts and resource conflicts, and then rank the SESAs to prioritize development.

k. BLM should complete a comprehensive cumulative impacts analysis.

As discussed in detail in our scoping comments on the PEIS (Exhibit 1), NEPA requires agencies to consider the cumulative impacts of proposed actions. In the context of the Solar PEIS, we want to reiterate the importance of considering other projects underway on public lands and, specifically, the development of wind and geothermal projects on public lands, which are reasonably foreseeable future actions that will have significant impacts on natural and cultural resources. There are currently 321 wind power project applications filed on public lands nationwide and 253 geothermal projects. Each of these projects will have individual impacts and taken together, in conjunction with the more than 200 solar project applications currently on file, will have significant *cumulative* impacts on our public lands. With the establishment of state RPS and, ultimately, a national RPS these renewable sources are going to become a bigger percentage of our energy portfolio over time. It is imperative that the BLM look *now* at the scope of cumulative impacts from these projects if renewables development on public lands is truly going to be environmentally responsible.

Supplemental Recommendations: The BLM should include the impacts of all forms of renewable energy development, not just solar, in its cumulative impacts analysis in the PEIS.

l. Develop a comprehensive, system-wide mitigation program.

Development of utility-scale solar power generation facilities will transform the lands upon which they are located and preclude most other uses. As noted by the BLM, other uses of these sites "are unlikely due to the intensive use of the site for PV [photovoltaic] or CSP [concentrating solar power] facility equipment." IM No. 2007-097.

BLM is obligated to manage the public lands to protect their varied natural and cultural resources. As discussed in detail in our original scoping comments on the Solar PEIS (Exhibit 1), the Federal Land Policy and Management Act requires the BLM to "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §1732(d)(2)(a). Further, NEPA requires consideration of measures to mitigate potential environmental consequences. 40 C.F.R. § 1502.16. In order for BLM to rely on mitigation to reduce potentially significant impacts, NEPA requires that BLM make a firm commitment to the mitigation and discuss the mitigation measures "in sufficient detail to ensure that environmental consequences have been fairly evaluated…"[27] NEPA defines "mitigation" of impacts (at 40 C.F.R. § 1508.20) to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

[27] *Communities, Inc. v. Busey*, 956 F.2d 619, 626 (6th Cir. 1992).

- Compensating for the impact by replacing or providing substitute resources or environments.

Simply identifying mitigation measures, without analyzing the effectiveness of the measures violates NEPA. BLM must "analyze the mitigation measures in detail [and] explain how effective the measures would be . . . A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA."[28] NEPA also directs that the "possibility of mitigation" should not be relied upon as a means to avoid further environmental analysis. *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*.[29]

(1) Mitigation measures must be mandatory.

BLM should specify in the land use plan amendments based on the PEIS as well as in the ROD that mitigation measures (such as "best management practices" in technology) are required to be included in each and every permit as long as certain circumstances are present. Unless the mitigation measures are guaranteed to be applied, BLM cannot rely upon them to avoid or lessen potential impacts from siting projects.

Recommendations: The PEIS and the ROD should include language requiring that the mitigation measures and other applicable measures be included in land use plan amendments and in all grants of rights-of-way or other permits for construction solar energy projects.

(2) Mitigation measures must be based on credible science.

Both NEPA and the Data Quality Act require the agencies to use and present information of sufficient scientific quality. Thus, NEPA's hard look at environmental consequences must be based on "accurate scientific information" of "high quality." 40 C.F.R. § 1500.1(b).

Essentially, NEPA "ensures that the agency, in reaching its decision, will have available and will carefully consider detailed information concerning significant environmental impacts."[30] The Data Quality Act and BLM's interpreting guidance expands on this obligation, requiring that influential scientific information use "best available science and supporting studies conducted in accordance with sound and objective scientific practices."[31]

Recommendations: The PEIS must assess and present the scientific basis for the proposed mitigation measures in order to show they will be effective.

(3) Monitoring and adaptive management approaches must include specific standards and commitments.

---

[28] *Northwest Indian Cemetery Protective Association v. Peterson*, 764 F.2d 581, 588 (9th Cir. 1985), *rev'd on other grounds*, 485 U.S. 439 (1988).
[29] Available on-line at: http://www.nepa.gov/nepa/regs/40/40p3.htm ; the U.S. Court of Appeals for the Tenth Circuit has found that the "Forty Questions" are "persuasive authority offering interpretive guidance" on NEPA from CEQ. *Davis v. Mineta*, 302 F.3d 1104,1125 (10th Cir. 2002).
[30] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).
[31] Treasury and General Government Appropriations Act for Fiscal Year 2001, Pub.L. No. 106-554, § 515. *See also* Bureau of Land Management, Information Quality Guidelines, *available at* http://www.blm.gov/nhp/efoia/data_quality/guidelines.pdf .

In order to fulfill the BLM's obligations to protect the natural and cultural resources of our public lands and to comply with NEPA's requirements regarding mitigation measures, the PEIS must include, and the ROD must require, that BLM's permits for projects contain concrete commitments to specific monitoring actions, including definitive standards, timing and details for actions that will be taken based on the results of monitoring and a discussion of BLM's basis for relying on their success, including likely funding. This approach will also support the phasing of projects discussed above.

All such mitigation programs should also identify the existing condition of resources, standards for when management change will be triggered and the use of a "fallback prescription" where adaptive management is not suitable or funding for necessary monitoring is not sufficient. All data should be identified in terms of their source, location, and time. Furthermore, data, and their application, should be available for independent review and evaluation; data should be formalized and standardized to allow for sophisticated and accurate aggregate understanding of the landscape and the impacts of management practices within the landscape to enhance agency credibility and accountability. The BLM should disclose not only the results of a given analysis, but the underlying methodology and data management practices used. The focus of data collection should be on the impacts – whether adverse or beneficial – caused by particular activities and not the activity itself.

The management framework for monitoring and adapting management of approved projects should be based on best available science and should include the following elements:

- ***Ensure adequate baseline prior to starting adaptive management and identify indicators.***

Projects can only be approved along with a requirement for a detailed analysis of current inventory status to accompany the environmental analysis, which clearly specifies resources that may be affected by various activities and their baseline conditions, then identify indicators for resources or groups of resources that will demonstrate the effects of management decisions.

- ***Set out a detailed monitoring plan and ensure agency commitment to fund monitoring.***

A detailed monitoring plan is crucial for assessing potential impacts on resource conditions, ensuring that indicators are measured at regular and consistent intervals. Commitment of adequate resources should be firm and sufficient to support the full implementation of adaptive management. Funding for adaptive management should not be dependent on shifting the financial and personnel burden to various user interests or other cooperating community groups.

- ***Include defined limits of acceptable change in resource conditions and specify actions to be taken if change reaches or exceeds those limits.***

For all indicators, the PEIS and ROD must require that, for all projects, BLM prepare an identification of range of acceptable change from the baseline condition, using best available science, and specify those actions that will be taken in the event that unacceptable levels of change are identified.

- ***Have a "fallback" plan should monitoring or other aspects of the adaptive management process not be fully carried out.***

Adaptive management must include requirements for when and how the proposed outcome will be reevaluated if it is not being met. BLM's ability to reevaluate or amend desired outcomes should not be the sole fallback if either the adaptive management process is not working or outcomes are not being met. The PEIS and ROD should require BLM to build into

project analysis and approvals provisions to address situations based on new information, circumstances, regulatory requirements, or discontinued agency funding for monitoring that would trigger a plan amendment or revision under a new EIS.

Recommendations: The PEIS should set out specific commitments, including timelines, for preparation and implementation of inventorying and monitoring programs, and standards for when monitoring as part of management is not appropriate, that are to be incorporated in permits for projects; the ROD should make incorporation an explicit requirement for all permits.

(4) Mitigation of impacts to individual resources and values.

In addition to NEPA's general requirement to mitigate environmental impacts, other laws and policies require specific consideration of mitigation for impacts to certain resources and values. For example, federal agencies are required to conserve species listed under the Endangered Species Act. *See, e.g.,* 16 U.S.C. § 1536(a)(1). Recovery plans for endangered species can help provide guidance on appropriate mitigation measures. Similarly, impacts to cultural resources require mitigation under the National Historic Preservation Act. *See, e.g.,* 36 C.F.R. §§ 800.1(a), 800.2(a)(4). Additional regulations may require specific mitigation measures to other individual resources and values.

Recommendations: BLM must comply with all regulations requiring mitigation of impacts from solar energy development on individual resources and values.

(5) Mitigation for the loss of availability for multiple-use on public lands.

Unlike many activities on public lands which allow for multiple uses, solar development is a single use of the land which preempts any other activities or uses. For this reason, it is critical that BLM mitigate for the effective loss of any lands approved for solar development from the public domain. Onsite mitigation for solar development is extremely important, and all efforts should be made to mitigate impacts onsite. However, since the opportunity for effective mitigation of onsite impacts to many resources and values is limited for solar development, off-site mitigation will also need to be considered for all projects. This mitigation should also compensate for the loss of other resources, values and uses of those lands, such as recreation, scenic vistas, wildlife migration corridors and habitat for other plants and animals.

IM 2008-204, which sets out BLM's current policy on off-site mitigation, defines off-site mitigation as "compensating for resource impacts by replacing or providing substitute resources or habitat at a different location than the project area." The guidance also acknowledges the priority of onsite mitigation, such that "[o]ffsite mitigation is supplemental to onsite mitigation and is used to enhance the BLM's ability to fulfill its mission of providing multiple uses on the public lands, while ensuring its resource management objectives are met." Further, like other mitigation measures, the agency must be able to show the mitigation will be effective. The guidance reiterates: "[w]hen proposed offsite mitigation is geographically distant from the project area, and particularly when it occurs on non-Federal land, the connection to resources for which the BLM is responsible should be clear."

Accordingly, although off-site mitigation is likely to play a key role in addressing the loss of use resulting from solar energy development, these measures must still be developed so that they have a clear connection to the resources that the BLM is managing.

Key considerations for off-site mitigation should include:

- **Identification of uses, resources and values associated with the project site.**

Establishing the connection between off-site mitigation and the resources of the public lands will require detailed understanding and knowledge of the values and uses present on the project site before development occurs, such as wildlife habitat, various recreational uses (ranging from hunting to birdwatching to all terrain vehicle use) and scenic values. BLM should require that necessary inventory of the project site be completed prior to developing off-site mitigation measures.

- **A "no net loss" or a "net gain" requirement for resources and values.**

BLM should ensure that any loss of resources or values on a solar development site is compensated with the addition and protection of equivalent or better resources and values off-site. For instance, backcountry hunting experiences would be re-established by identifying lands with suitable big game habitat and ensuring those lands are managed to maintain wildlife populations and protect a non-motorized experience. These lands might also be able to replace scenic values and hiking or horseback riding opportunities, depending on management. BLM should also make a determination about the value of the habitat to be impacted and adopt direction for mitigation requirements for the specific habitat types impacted. For example, for high quality habitat which is relatively scarce or becoming scarce on a national basis or in the ecoregion section, BLM policy should ensure no net loss of in-kind habitat value.

Additions of lands and resources should equal or exceed the value of any resources or values which are lost. Additions could be gained through some combination of three primary mechanisms; however, requirements should ensure that the majority of mitigation efforts be focused on the first two mechanisms, with the highest priority given to the first mechanism:

1) Purchase of additional private lands to be put in the federal estate under conservation management to guarantee the maintenance of the equivalent or better values and resources lost on the project site, or
2) Additional conservation designations on existing federal lands which would protect the equivalent or better resources and values lost on the project site, or
3) Restoration and research efforts to improve the quality and quantity of equivalent resources and values off-site.

Mitigation for impacts to water resources could be addressed by purchase and retirement of water rights to offset groundwater pumping by the project.

- **Requirements for project developers to fund mitigation efforts based on the amount and value of the land impacted from development.**

Project developers should be required to make deposits to a mitigation fund based on the amount of land used for the project and the fair market value of that land. The funds should be required to be spent on the three mechanisms outlined above.

- **Requirements for project developers to mitigate the ongoing pressure for energy development on the public lands.**

Since project developers will profit from the development of solar energy on the public lands, they can also be obligated to lessen the future demands to be made upon these lands. Project developers can present proposals to achieve these goals by providing financial support for specific distributed generation efforts, energy efficiency measures, demand reduction programs, or equipment upgrades in the region. We recommend that developers be required to identify megawatts of demand mitigation that equate to a percentage of the megawatts they expect to generate.

- **A centralized body should be established to oversee the funds and maximize the effectiveness of their use.**

BLM should establish a centralized body comprised of BLM staff, and other federal and state agencies with expertise and interest to oversee the distribution of funds and maximize the effectiveness of their use. This body should be required to take into consideration recommendations from the public in the distribution of funds.

- **Off-site mitigation should be required to take place in the same ecoregion as the project site.**

The World Wildlife Fund defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions".[32] Ecoregional health is critical for maintaining the health of individual ecosystems within the ecoregion. In addition to ensuring that off-site mitigation meets a "no net loss" requirement for resources and values lost on the project site, BLM should require that mitigation take place in the same ecoregion as the project site, to ensure the continued health of the overall ecoregion. In situations where availability of private lands for purchase and addition to the federal estate under conservation protection is limited (in Nevada, for example, where the vast majority of lands are already in the federal domain), additional conservation designations on existing BLM land, as well restoration, research, and other mitigation measures, will be necessary.

Recommendations: Because of the extremely limited ability to mitigate impacts from solar development on-site, BLM should require off-site mitigation for impacts which cannot be mitigated on-site. Off-site mitigation should follow the guidelines described above including: 1) a "no net loss" or a "net gain" requirement for resources and values; 2) requirements for project developers to fund mitigation efforts based on the amount and value of the land impacted from development; 3) a centralized body should be established to oversee the funds and maximize the effectiveness of their use; and 4) off-site mitigation should be required to take place in the same ecoregion as the project site.

m. The PEIS needs to address "hybrid" solar plants.

The groups submitting these comments are concerned about the possibility that some companies may try to portray what are truly fossil fuel (i.e., natural gas) plants as renewable energy projects. These purported renewable energy projects could severely undermine public support for the solar program once it is established. This problem could be prevented by adopting a definition of a "renewable solar project" for use in the new program. According to several technology experts whom we consulted, under current financial regulations, including the Investment Tax Credit, projects that use more than 25% natural gas are not considered "renewable."

[32] http://www.panda.org/about_our_earth/ecoregions/about/what_is_an_ecoregion/

Recommendation: The PEIS should consider and the final solar program should adopt a definition of a renewable solar project that will ensure that lands that are appropriate for "real" solar projects are not usurped by projects that are actually natural gas plants.

n. Development of a long-term vision for the necessary contribution of public lands to the nation's renewable energy needs will assist in determining the need for solar energy development on the public lands.

There is an urgent need for a comprehensive energy vision and renewable energy goal for the West (as well as the nation) that will help focus the agency on the contributions from solar energy (and other renewable resources) to meeting multiple forward-thinking scenarios. Such a goal will also help in the creation of a common set of expectations about the scope of development envisioned for the public lands that, in turn, will help BLM manage stakeholder expectations and concerns.. We urge the BLM to be an advocate for and a participant in the development of such a vision and goal within the Administration and, in particular, with DOE, the Council on Environmental Quality and the DOD as well as with the western states, utilities, transmission planners and the public.

The main driver for these scenarios must be an energy resource mix for the West that moves the region forward in addressing climate change. Other drivers include: 1) long term energy security at both consumer and national levels; 2) diversity for generation portfolios to manage risks (particularly fossil fuel price risks); 3) net reductions in environmental costs, criteria pollutants, and health costs; and 4) coal plant alternatives and retirements. The scenarios developed should be responsive to all drivers, and should focus on science-based targets for CO2 reductions in the electricity sector, in addition to emissions reductions possible through electrification of a portion of our transportation fleet. Such scenarios could include meeting various state Renewable Portfolio Standards, a uniform national standard, or achieving 80% CO2 reductions from 2005 levels by 2050– and 40% reductions by 2030 as a preliminary target and planning tool.

Recommendations: We recognize that this larger vision will require a comprehensive effort outside the PEIS. The BLM, with the assistance of the agencies identified above, should engage in a scenario development exercise to determine a target for megawatt production of renewable energy on public lands under its stewardship. We have detailed the manner in which the BLM could develop scenarios to define the contribution needed from the public lands in Exhibit 5, attached.

II. SESAs identified by the BLM and alternatives.

a. Selection of study areas needs clarification.

In its "Qs and As" document, the BLM purported to identify the criteria that were used to identify and select SESAs.[33] In fact, different states used different criteria as was made clear in connection with a teleconference held on August 24, 2009 by BLM officials with environmental advocates. We recognize that there may be important regional differences, such that one single set of criteria might not be sufficient for all states identifying SESAs.

[33] *Qs & As: BLM Solar Programmatic Environmental Impact Statement (PEIS)*, available on-line at: http://www.doi.gov/news/09_News_Releases/SolarEnergyQA.pdf

Nonetheless, we do believe that all states should use a consistent set of core criteria and that BLM is obligated to explain why each of those criteria was included. Further, we believe that BLM needs to make public all the criteria used by each state along with explanations for inclusion of non-core criteria. All of these criteria must be publicly applied to the SESAs that have been proposed, using maps and links to GIS data. The same criteria should also be applied to the additional SESAs considered as alternatives in each state. All of this information must be included in the Draft PEIS.

Recommendations: The Draft PEIS must include complete information about how the SESAs were selected and must apply the same selection criteria to all alternative SESAs that are considered.

b. SESAs should be included in all "action alternatives" in the Draft PEIS.

Inclusion of SESAs in all "action alternatives" in the Draft PEIS is critical to ensure that the benefits of identifying SESAs and designating them as SEZs in the Final PEIS and ROD are realized. Further, to achieve the goal of a robust set of SEZs with adequate acreage for development of the solar energy deemed necessary, it is critical that BLM consider additional SESAs identified by industry, conservation groups and others as part of the PEIS process. This is particularly important in Arizona, where the acreage of the SESAs identified in the scoping notice is extremely limited. We understand that five of the eight SESAs originally identified by Arizona BLM were not included in the scoping notice because they had existing applications in them, despite the fact that overlap with existing applications was not a criterion for exclusion of an area as a potential SESA. We also understand that in some states, including Nevada, lands with existing oil and gas leases were excluded from SESAs. Because oil and gas leases are not permanent, these lands should not be excluded. These lands and other areas nominated for consideration as SESAs could be appropriate for inclusion, pending application of the screens outlined above, and should be considered.

Recommendations: BLM should include consideration of SESAs in all alternatives other than the No Action Alternative in the Draft PEIS, and the Final PEIS and ROD should designate appropriate SESAs as SEZs, open for solar development. BLM should analyze and consider additional SESAs identified by the public and BLM state offices to ensure that adequate acreage necessary to meet the solar development needs identified through the analysis outlined in section I n is included.

c. Comments on SESAs and alternatives for each State.

We are including as a separate document detailed comments on the BLM's proposals in each of the six states encompassed by the Solar PEIS, including maps and GIS data where available. Again, please note that not all groups signed on to these broader comments are signing on to the additional state-specific and cultural resources comments attached as exhibits, so we have specifically identified those groups that are specifically signing on at the beginning of each state-specific comment exhibit and the cultural resources exhibit (exhibits 6-12).

The state-specific and cultural resources exhibits are as follows:

- Arizona – Exhibit 6
- California – Exhibit 7
- Colorado – Exhibit 8

- Nevada – Exhibit 9
- New Mexico – Exhibit 10
- Utah – Exhibit 11
- Cultural Resources – Exhibit 12

Since GIS analysis of many of the SESAs and other areas identified on the maps in relation to citizen-proposed wilderness, wildlife habitat and other resources of concern is continuing, we anticipate that additional information may be developed and will submit supplemental comments.

Recommendations: BLM should fully consider the information and recommendations included in the attached exhibits.

III. Analysis of lands outside SESAs identified on the maps for potential solar development should not proceed unless they meet the criteria for and are incorporated in SESAs.

As described above in Section II c., one of the most important outcomes from the development of the PEIS will be designation of appropriate lands as SEZs, closure of other lands to new applications, and either denial of existing applications outside the SEZs or serious efforts to incentivize developers to move existing applications to within the SEZs. These steps are crucial not only in guiding development to the most appropriate places, but also in avoiding the unacceptable impacts which solar development would have on lands outside the SEZs.

The recent letter submitted by the BLM Las Cruces District Office recommending the elimination of the Mason Draw and Red Sand SESAs because of recently-discovered conflicts with wildlife habitat underscores the need for the BLM to focus its analysis on SESAs and the importance of closing lands outside of SEZs to development. Although the SESAs were identified through the BLM New Mexico officials' screening for areas potentially appropriate for development based on guidance from BLM Washington Office, subsequent analysis by the BLM identified unacceptable conflicts, highlighting the type of conflicts that can arise in those areas that met the threshold SESA criteria. Additional lands that do not meet these threshold standards for prioritization as SEZs are even more likely to have such conflicts. Although statewide maps and GIS data for lands identified on the SESA maps in light blue and in the legend as "BLM Lands Being Analyzed for Solar Development in the PEIS" (referred to as non-SESA lands) have not been made available, rough analysis of the lands shown in the SESA maps already indicate many areas of high conflict, further supporting the closure of lands outside SESAs to solar development.

For example, in New Mexico, non-SESA lands identified on the maps overlap with Otero Mesa, one of the most ecologically intact and treasured landscapes in the Southwest. The values of Otero Mesa and the importance of protecting it have been advocated by the State of New Mexico, religious leaders, local governments, sportsmen and conservationists; further, the U.S. Court of Appeals for the 10th Circuit recently acknowledged its values as a Chihuahuan Desert grassland, as home to rare species, as essentially roadless, and as housing the substantial freshwater Salt Basin Aquifer, pointing to the "importance of this valuable resource."[34] In addition, the area contains lands with wilderness characteristics, as identified by the New Mexico Wilderness Alliance, which the BLM is in the process of re-inventorying as part of the

[34] *State of New Mexico v. BLM*, Case Nos. 06-2352, 06-2353, 06-2354 (10th Cir. - April 28, 2009).

TriCounty RMP revision (highlighting the need to ensure that such inventories and/or re-inventories are conducted prior to designating SESAs).

Solar development would clearly cause lasting and irreparable damage to the rich values and resources of Otero Mesa, and is absolutely inappropriate for the area.

An example non-SESA lands with major conflicts with solar development in Utah is the Parowan Gap area. This area contains petroglyphs and an incredible prehistoric astronomical site. Given the cultural importance of this site, no development of any kind should occur here. From the extent of the light blue areas on the visible portion of the Utah SESA Map, it is likely that other such conflicts exist in the light blue areas in southwestern Utah and throughout the state.

Examples of other non-SESA lands equally inappropriate for solar development but which have been identified on the SESA maps for potential analysis can be expected in the other 4 states included in the PEIS. These examples clearly demonstrate the need to identify appropriate SESAs, designate them as SEZs through the PEIS process, and restrict solar development to those SEZs which are included in the Final PEIS and ROD.

Recommendations: To avoid unacceptable and irreparable damage to areas like Otero Mesa and other lands which are currently identified in the SESA maps as non-SESA lands under consideration for solar development, BLM should identify appropriate SESAs, designate them as SEZs through the PEIS process, and restrict solar development to those SEZs which are included in the Final PEIS and ROD unless and until a need for additional development areas is shown.

As more information becomes available on the SESAs or additional lands, we will continue to provide data and recommendations to the BLM. We look forward to continuing working with BLM in the development of the Solar PEIS.

cc: Linda Resseguie, BLM Washington Office, linda_resseguie@blm.gov

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Johanna H. Wald, Senior Attorney
Natural Resources Defense Council
111 Sutter Street
San Francisco, CA 94104

Peter Nelson, Federal Lands Program, Director
Defenders of Wildlife
1130 17th Street N.W.
Washington D.C. 20036-4604

Jim Catlin, Project Coordinator

Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

Josh Pollock, Conservation Director
Center for Native Ecosystems
1536 Wynkoop St, Ste 303
Denver, CO 80202

Tom Darin, Staff Attorney, Energy Transmission
Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Nathan Newcomer, Associate Director
New Mexico Wilderness Alliance
P.O. Box 25464
Albuquerque, NM 87125

Kevin Gaither-Banchoff, Executive Director
Arizona Wilderness Coalition
P.O. Box 40340
Tucson, AZ 85717

Michael J. Painter, Coordinator
Californians for Western Wilderness
P.O. Box 210474
San Francisco, CA 94121-0474

Justin Allegro, Legislative Representative for Wildlife Conservation
National Wildlife Federation
Global Warming Safeguards
901 E Street NW, Suite 400
Washington, DC 20004

Greg Suba, Conservation Program Director
California Native Plant Society
2707 K Street
Sacramento, CA 95816

Bruce Pendery, Staff Attorney & Program Director
Wyoming Outdoor Council
444 East 800 North
Logan, UT 84321

Carrie Curtiss, Program Director
Colorado Environmental Coalition
1536 Wynkoop St., Ste. 5C
Denver, CO 80202

Veronica Egan, Executive Director
Great Old Broads for Wilderness
649 E. College Drive
PO Box 2924
Durango, CO 81302

Dave Willis, Coordinator
Soda Mountain Wilderness Council
P.O. Box 512
Ashland, OR 97520

Monica Argandoña, Desert Program Director
California Wilderness Coalition
167 North Third Avenue, Suite M
Upland, CA 91786

Nick Ervin, Board of Directors President
Desert Protective Council
P.O. Box 3635
San Diego, CA 92163

Carl Zichella, Western Renewable Projects Director
Sierra Club
801 K Street, Suite 2700
Sacramento, CA 95814

Tiffany Bartz, Field Attorney
Southern Utah Wilderness Alliance
425 East 100 South
Salt Lake City, UT 84111

Pat Flanagan, Resource Advocate
Mojave Desert Land Trust
6393 Sunset Road
Joshua Tree, CA 92252

Exhibits

1. Solar PEIS scoping comments
2. CWP recommendations letter, spreadsheet, and GIS data
3. Arizona Restoration Energy Design comments
4. Protocol developed by WGA with the federal government, including the Department of the Interior and the Council on Environmental Quality that provides for a consolidated permitting process
5. Scenario Development for Identifying Megawatt Target
6. Arizona SESAs-specific comments
7. California SESAs-specific comments
8. Colorado SESAs-specific comments
9. Nevada SESAs-specific comments
10. New Mexico SESAs-specific comments

11. Nevada SESAs-specific comments
12. Cultural resources SESAs-specific comments

THE WILDERNESS SOCIETY

July 15, 2008

Delivered via electronic mail and overnight mail (with attachments)

Solar Energy PEIS Scoping
Argonne National Laboratory
9700 S. Cass Ave. - EVS/900
Argonne, IL 60439

Re: Scoping Comments on the Solar Energy Programmatic Environmental Impact Statement

To Whom It May Concern:

Please accept and fully consider these scoping comments on behalf of The Wilderness Society and the other organizations identified below. The Wilderness Society's more than 300,000 members and supporters nationwide care deeply about the management of our public lands. Founded in 1935, our mission is to protect wilderness and inspire Americans to care for our wild places. We appreciate the opportunity to submit these comments to the Bureau of Land Management and Department of Energy on the Programmatic Environmental Impact Statement (PEIS) for agency-wide solar energy programs and policy. We are submitting these comments today via the website and also forwarding a copy with attachments to you separately.

At a time when the threat of global warming, air and water pollution, and dramatically escalating fuel prices stand to force Americans to entirely rethink how we obtain and consume energy, the Bureau of Land Management (BLM) and Department of Energy (DOE) now have the opportunity to play a critical role in cutting-edge, non-polluting and renewable energy development. The Solar Energy Programmatic Environmental Impact Statement (PEIS) provides an important part of that opportunity.

We support the agencies' commitment to develop the Solar Energy PEIS and urge you to take this opportunity to commit to responsible development of solar energy resources. The PEIS process should be carried out thoughtfully, rigorously, and with a sense of urgency needed to balance the current drive to develop oil and natural gas on our public lands. Oil and natural gas companies have been given the opportunity to lease and run roughshod over some of our most precious public lands throughout the West with minimal consideration for the ecological, recreational and cultural resources that exist there. This PEIS is a chance to plan for development that does not ignore the other important uses and values of these lands.

We support development of renewable energy resources, such as solar, because doing so promotes non-polluting, sustainable energy production that will benefit Americans and our public lands in the long term and encourages a move from a fossil fuels-based economy to a renewables-based economy. America's public lands include significant solar energy resources and have a role to play in supporting utility-scale solar power plants. However, we want to emphasize that more energy development is not a standalone solution to our nation's energy needs. Reducing our energy demands through energy efficiency, conservation, and demand-side management practices is a vital first step.

Moreover, as advocates for America's wild places, we believe that, in order to minimize the impact to our public lands, they should not be the first option for industrial levels of energy development, especially when private or state land is available. Further, there are places on our public lands that are wholly inappropriate for utility-scale solar energy development. Our most pristine lands, especially those with wilderness characteristics and those that possess vast cultural and diverse biological resources, should be off-limits to solar energy development.

The BLM and DOE must take a rigorous "look before you leap" approach to how they will facilitate utility-scale solar development, seriously considering the environmental, cultural, economic and ecological impacts of large-scale solar energy development before rights-of-way are approved or other funding provided. Solar energy production should be "green" in every way – harnessing a clean and renewable energy source on public land while very minimally impacting the land and the natural resources we hold dear.

The BLM already faces a backlog of more than 130 applications representing more than 70 gigawatts of solar potential. Over the last seven years, the BLM has processed no solar permits, but managed to process more than 35,000 oil applications for permit to drill for oil and natural gas projects. We understand the BLM's decision to continue processing permits and encourage the agency to do so in a way that prioritizes projects that are likely to come to fruition, by having secured project financing and power purchase agreements, as well as in locations that are not environmentally sensitive or highly controversial. The Wilderness Society's President, William H. Meadows, wrote a July 8, 2008 letter to the House Appropriations Committee encouraging funding for this overall approach (copy attached for your reference). Because the BLM will be amending land use plans and developing a PEIS that may be relied upon for permitting projects, the bulk of our comments address the manner in which the BLM should analyze impacts and develop its solar energy development program. We also discuss considerations that the DOE should incorporate into its project funding at the end of the comments.

This PEIS is the BLM and DOE's opportunity to do energy development right on our public lands – a chance to show that the ecological integrity of the public estate is at least as important as renewable energy production. We hope that these comments will be of assistance.

Issues Addressed **Page**

I. Considerations for Siting of Energy Corridors 3
A. Areas to Avoid 3
B. Maximize Use of Impaired Lands and/or Existing Infrastructure 4
C. Additional Siting Considerations 5

II. Right-of-Way Terms and Conditions 5

III. BLM Proposed Planning Criteria 8

IV. Issues for Further Analysis 19
A. Protection of Lands with Wilderness Characteristics 19
B. Protection of Wildlife Habitat 19
C. Special Management Areas 21
D. Socioeconomic Impacts 22
E. Scope of NEPA analysis 32
F. Transmission 38

V. Department of Energy Solar Energy Program 39
A. Current DOE Solar Energy Program
B. Issues to be Addressed in the PEIS
C. Range of Alternatives

List of Attachments 42
References 43

I. Considerations for Siting of Energy Corridors

Development of utility-scale solar power generation facilities will transform the lands upon which they are located and preclude most other uses. As noted by the BLM, other uses of these sites "are unlikely due to the intensive use of the site for PV [photovoltaic] or CSP [concentrating solar power] facility equipment." Instruction Memorandum (IM) No. 2007-097. An inappropriately sited and constructed solar energy facility has the potential to cause significant damage to the environment and to human health. **Accordingly, it is crucial that the BLM commit to avoiding sensitive areas, obtain necessary information on lands with wilderness characteristics and consider maximizing use of existing infrastructure (where appropriate) in siting solar facilities.**

A. Areas to Avoid:

We appreciate the BLM's acknowledgment that certain places are not appropriate for large solar energy facilities and agree that categories of lands to be avoided should be included in the PEIS. Based on their important natural values and potential for damage from the construction, use and maintenance of solar facilities, we recommend that the PEIS include a commitment to not permit siting of utility-scale solar energy facilities in the following areas on BLM lands:

1. Wilderness Areas;
2. Wilderness Study Areas (WSAs);
3. National Monuments;
4. National Conservation Areas;
5. Other lands within BLM's National Landscape Conservation System (NLCS), such as Outstanding Natural Areas;
6. National Historic and National Scenic Trails;
7. National Wild, Scenic, and Recreational Rivers, study rivers and segments, and eligible rivers and segments;
8. Areas of Critical Environmental Concern (ACECs);
9. Threatened, endangered and sensitive species habitat, as well as critical cores and linkages for wildlife habitat;
10. Citizen-proposed wilderness areas; and
11. Other lands with wilderness characteristics.

This category should also include lands that are included in pending legislation for designation in one of the above categories or would otherwise include provisions that prohibit solar energy development. Further, while we believe it is of primary importance that no solar energy facility or transmission corridor be placed directly in or through any of the types of areas listed above, it is equally important that solar energy facilities not infringe on the recreational enjoyment of certain types of areas or otherwise interfere with their natural function or other special values.

Recommendation: Solar energy facilities should not be sited in the categories of lands listed above and should not be sited immediately adjacent to these areas, if doing so would degrade the viewshed for scenic areas or negatively impact the ecological values for which these areas were designated.

B. Maximize Use of Areas That Are Already Degraded, Existing Infrastructure and Load to be Served as Appropriate

In addition to avoiding ecologically-sensitive lands, we recommend that the PEIS require that lands that are already impaired be considered first for proposed utility-scale solar development. Abandoned mines, developed oil and gas fields, and other brownfields, which are not being restored to ecological function, provide opportunities for solar energy development without loss of other uses and values. Such sites are often close to existing infrastructure, which is another important consideration, both in conjunction with degraded sites and as a separate factor. Proximity to existing infrastructure will minimize new road construction or major roadway improvements (such as paving and widening), avoiding another set of impacts on the public lands. Further, proximity to the load that will be served by the project will limit the amount of new transmission needed and reduce related income.

DOE has already emphasized the benefits of using brownfields for solar energy development in its "Brightfields" initiative, an attempt to revitalize heavily-impacted industrial areas by turning them into large-scale renewable energy generating areas. DOE has found that such use of brownfields contributes to urban renewal, allowing communities to take advantage of locally-

produced clean power, attracting "green" businesses to the area and allowing communities to offset their use of polluting energy sources.

Recommendation: The PEIS should specifically prioritize use of degraded lands that are not identified for restoration and sites with proximity to existing infrastructure and load to be served to avoid unnecessary impacts on public lands.

C. Additional Siting Considerations

The PEIS should also identify additional criteria to be considered in determining whether lands are appropriate for utility-scale energy development. The BLM should consider the availability of impaired lands on private or state land as alternatives to development on public land. In addition, the agency should consider:

- the availability of water at the site or, if water is not available on-site, other sources;
- likelihood that the project is ready to proceed - status of financing, power purchase agreements and regulatory permits;
- proximity to housing for workers – to determine additional infrastructure and use of roads that may be needed.

Recommendation: The PEIS should require evaluation of the above factors in determining whether a site is appropriate for utility-scale solar development.

II. Right-of-Way Terms and Conditions

The BLM will permit solar energy development subject to right-of-way (ROW) authorizations under Title V of the Federal Land Policy and Management Act (FLPMA) and implementing regulations, 43 C.F.R. Part 2800, which also requires a plan of development (POD). These documents should contain key terms for responsible development, including:

A. Reasonable Term and Diligent Development

While the BLM's ROW regulations do not impose specific limits on the terms for ROWs, as acknowledged in IM 2007-097, the term for the ROW should not exceed the design life of the project, typically 30 years. Further, ROWs should also require that companies exercise reasonable diligence in developing and producing solar energy, such that the ROW can be terminated if progress is not being made and other uses of the land are not precluded without justification.

B. Changes in Applicable Laws and Regulations are Incorporated

If applicable laws and regulations change during the term of the ROW, then they should be automatically incorporated. For example, species such as the sage grouse are currently being considered for listing under the Endangered Species Act. Should such a listing occur, the terms of the ROW must be clear that compliance with activities triggered by the listing are required and are not subject to challenge.

C. Monitoring, Phased Development and Adaptive Management

Plans of development should require that a minimum footprint first be developed, so that monitoring can determine not only if the project is likely to be technically successful but also if projected damage to the environment is consistent or requires additional mitigation measures or other changes to the project before proceeding. Only once technical and environmental considerations are addressed, should the project be permitted to proceed to the next level of development.

Detailed monitoring plans should be required for the construction and operation of the project to identify key indicators of environmental effects on-site and on adjacent lands. These plans should also provide for changes to the project to be made to ensure that environmental effects do not exceed expected and acceptable levels.

D. Restoration and Bonding

Bonding should be sufficient to cover the costs of restoration, as well as the cost of compliance with other terms of the ROW grant, including actions that the agency may take if the ROW grant is terminated for noncompliance. *See*, IM No.2007-097.

Restoration of the site includes not only removal of equipment but also reclamation of surface disturbance, including the facility footprint and access roads, and revegetation with native species in a distribution comparable to that of surrounding lands. However, based on the transformation of a site connected with utility-scale solar development, barring significant changes in technology, restoration may not be feasible. Further, sites selected for development on public land should ultimately be those with the combination of the highest solar potential and most acceptable location (in terms of other ecological values). Accordingly, the BLM should consider requiring project proponents to commit to long-term use of the land for solar generation, so that the bond amount could be used to ensure that the site is suitable for transfer to a successor or converted to another technology.

E. Management Practices to Limit Impacts on the Environment

Right-of-way grants should include a standard term requiring that operations are conducted in a manner that minimizes and seeks to avoid adverse impacts to land, air and water, and to cultural, biological, visual, and other resources, as well as to other land uses and users. The BLM should also retain the right to require reasonable measures be taken to fulfill this requirement, such as modification to facility siting or design, timing and location of construction activities, and specification of interim and final reclamation measures. The agency's standard oil and gas lease terms contain a comparable term, which could be used as a starting point. However, because the ROW should also include a right to require phased development and other changes based on monitoring results, the BLM's ability to require "reasonable measures" should be more broadly defined.

Other management practices that will limit the overall impact of utility-scale solar development should also be included in the terms of the ROW, such as:

1. locating roads and maintaining the site to avoid erosion and sedimentation, limit number of roads needed, minimize habit disruption;
2. preconstruction surveys for threatened and endangered species, as well as state listed species;
3. protection plans for adjacent habitat and species;
4. off-site mitigation where habitat disruption is unavoidable;
5. locate facilities in proximity to existing transmission infrastructure, roadways and sources of other necessary resources;
6. minimize the overall size of the facility;
7. minimize use of water;
8. include avian protection plans (*see* www.aplic.org) for all related transmission lines;
9. periodically assess feasibility of incorporating technological advances that improve efficiency and/or reduce impacts on wildlife and other natural resources.

F. Termination for Noncompliance

Should the ROW holder fail to comply with any of the terms set out in the grant or the plan of development, the BLM should have the ability to terminate the ROW if the failure continues for 30 days after written notice. The ROW grant should also explicitly provide that, in the event of termination, the BLM has the right to use the bonded funds to dispose of the facility and restore the site. Once again, while the agency's standard oil and gas lease contains a comparable term, it is important that the ROW grant for development of utility scale solar energy contain explicit remedies for not only termination but also for restoring the land to its previous condition.

Recommendation: The BLM should develop an expanded set of standard terms that will be set out in the PEIS and incorporated into all ROWs and plans of development where applicable.

G. Revisions to BLM's ROW Process

The BLM's right-of-way process was designed primarily for short-term uses and linear ROWs, such as pipelines, or ROWs with a relatively limited footprint, such as communication sites. Even in the case of ROWs for wind energy projects, there is still land that is not in active use and is available for other uses. ROWs for utility-scale solar energy development will be long-term and will encompass total disruption of the land to the virtual exclusion of all other uses, as acknowledged in IM No. 2007-097. Accordingly, the agency should consider revisions to the ROW process, both procedures and regulations, to address this important difference.

For instance, the federal government is currently compensated for ROWs by a relatively low cost monthly payment per acre of land. Due to the way that federal land will be exclusively devoted to the solar project, the agency could consider revising the payment scheme to reflect this reality and could include some form of royalty payment to acknowledge the profits that will be made by solar energy developers and/or to compensate the public for the loss of use of the land developed. More comprehensive revisions could also assess whether the ROW structure should be maintained for solar projects, or whether a lease or purchase approach might be more suitable.

Further, as discussed above, because sites for utility-scale solar development on public lands should be those that are most productive and most suitable, the agency should consider requiring that sites continue to be used for solar energy production. This approach could include limiting a project proponent's ability to obtain a ROW for a new project if the same proponent is seeking to abandon another site.

In addition, the BLM's current ROW policy is to process applications on a first-come, first-serve basis. However, this approach may not yield the best return for the agency and also may not lead to the most thoughtful development of parcels – for instance, where a wind energy project and a solar energy project could both be served by the same area or one project may have less environmental impacts. As the BLM acknowledges in IM No. 2007-097, the ROW regulations (43 CFR § 2804.23(c)) provide authority for offering public lands under competitive bidding procedures for solar energy right-of-way authorizations. Competitive bidding and comparison of projects based on their likely success, taking into account the ability to limit environmental effects, the applicant's technical and financial capability, and the amount of power to be generated, could be used to improve the process of awarding ROW grants to ensure that the best use is made of our public lands when they are provided for energy development.

Recommendation: The BLM should consider revisions to its ROW process to address the current explosion in applications for ROWs for both solar and wind development, as well as the particularly high impacts of utility-scale solar development, including through adjustments to the pricing and/or structure of ROWs and through providing a mechanism to choose amongst competing projects.

III. BLM Proposed Planning Criteria

The Notice of Intent identifies a list of planning criteria for amendment of applicable land use plans to incorporate the BLM's solar energy program. We agree that many of these criteria, reproduced below, will be necessary in properly analyzing solar energy development and have identified additional issues and clarification for the BLM to consider under each criterion; we have organized our comments by restating in summary fashion each of the proposed planning criteria listed in the Notice of Intent.

A. Comply with Applicable Laws and Policies

In complying with applicable laws and policies, the BLM should take the initiative to consult with the U.S. Fish and Wildlife Service to fulfill the requirements of the Endangered Species Act, instead of deferring consultation until specific projects are proposed. Further, per Executive Order 12898, BLM is required to assess the potential for disproportionately high and adverse human health or environmental impacts on minority and/or low-income populations. As discussed throughout these comments, development of utility-scale solar energy has the potential to degrade natural areas and to inflict market and non-market costs on local communities, as well as affect water supply and quality. The agency should consider the manner in which these costs might disproportionately affect minority or low-income populations in proximity to development and take appropriate steps to address potential environmental injustice.

B. Use PEIS as Analytical Basis for Amending Land Use Plans

In order for BLM to support amendment of land use plans and to tier to the PEIS in connection with subsequent decision-making processes, the analysis conducted under the National Environmental Policy Act (NEPA) must be sufficiently robust to support the determination that specific lands are suitable for development. The PEIS and subsequent amendment should also require site-specific environmental review prior to approval of projects with opportunities for public comment.

C. Develop Reasonable Foreseeable Development Scenario and Identify Lands Available for Development, Lands Available for Development with Restrictive Stipulations, and Lands Not Available

1. RFD scenario

We commend the BLM for developing a reasonable foreseeable development scenario (RFD) for solar energy development, which provides a projection of expected levels of development as a basis for evaluating and managing environmental effects. The RFD should project development for each resource management plan (RMP) that is amended by the PEIS and associated surface disturbance, including from associated infrastructure, such as roads and transmission. In addition, the RMP amendments established by the PEIS must include methods for monitoring impacts to other resources managed by BLM and a specific plan for conducting further NEPA review should the RFD appear likely to be exceeded. The specific applications for solar projects that the BLM is currently reviewing can serve as models for the PEIS and can provide valuable information for assessing the RFD. BLM should incorporate the specifics of these projects into the PEIS to provide examples for detailed impact analysis.

2. Identification of available lands

Due to the nature of large-scale solar energy production, mitigation measures and restrictive stipulations are severely limited. The most important aspect of mitigation for solar energy will be establishing lands that are closed to development. Therefore, the PEIS must specifically identify lands open to solar and lands closed to solar in addition to best management practices.

D. Limit Amendments to Utility-Scale Solar Energy Development and Associated Transmission Issues

After analyzing impacts from solar energy projects on other resources, it may become necessary for BLM to change management prescriptions for other resources in order to best protect them in the context of making lands available for utility-scale solar energy development. These additional prescriptions can and should be included in the RMP amendments.

E. Continue to Manage Other Resources Based On Current Terms of RMPs

The PEIS should address whether current RMP terms are satisfactory for protecting other resources after potential impacts from solar development have been analyzed and make changes as appropriate as part of the RMP amendments. We have included more information on potentially affected resources in Section IV.

F. Recognize Valid Existing Rights

While we realize the obligation of the BLM to recognize existing rights, BLM often has the ability to make changes in current conditions of use without foreclosing those rights and can also engage in negotiations and/or cooperative collaboration to effectuate important changes.

G. Coordinate with Other Governments/Agencies and Seek Consistency

FLPMA requires that the BLM's guidance and management policies shall "be consistent with officially approved and adopted resource related policies and programs of other Federal agencies, State and local governments and Indian tribes." 43 U.S.C. § 1712(c)(9); 43 C.F.R. § 1610.3-2. There are currently three major planning processes underway in the Western United States that we wanted to highlight for the BLM to address in the Solar PEIS because of the potential overlap in goals: the state of California's Renewable Energy Transmission Initiative (RETI), the Western Governors Association's (WGA) Western Renewable Energy Zones (WREZ), and the West-wide Energy Corridors PEIS.

RETI is a California "statewide initiative to help identify the transmission projects needed to accommodate renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting." (*see* http://www.energy.ca.gov/reti/index.html). RETI is relevant to the Solar PEIS because it will establish transmission projects that should be completed throughout the state of California for the purpose of connecting renewable energy projects to the statewide grid. RETI also considers opportunities in neighboring states, including Arizona and Nevada. Therefore, solar projects in California and neighboring states should be situated in accordance with the RETI results. The PEIS should state that solar projects in California and neighboring states will be assessed in accordance with their proximity to the RETI corridors.

WREZ is a cooperative initiative between the Western Governor's Association (WGA) and the US Department of Energy. It is a project to address transmission barriers to increased renewable energy production in the West. WREZ intends to "generate (1) reliable information for use by decision-makers that supports the cost-effective and environmentally sensitive renewable energy development in specified zones, and (2) conceptual transmission plans for delivering that energy to load centers" (*see* http://www.westgov.org/wga/initiatives/wrez/) Importantly, the WREZ effort will combine solar resource data from government and industry with lands, wildlife and natural resource information from state agencies and the conservation community. Most of the states within the scope of this PEIS have initiatives to identify locations and provide incentives for renewable energy development and transmission:

- New Mexico's Renewable Energy Transmission Authority was created to "stimulate clean energy production and create high-paying jobs, capital investment and greater economic development in rural areas." (www.nmreta.org)
- Colorado's Clean Energy Development Authority is directed to "facilitate the financing of renewable energy projects in Colorado."
- Nevada's Renewable Energy Transmission Access Authority is tasked to "propose recommendations for improved access to the grid system by which renewable energy industries can set up and have market access in Nevada and neighboring states."

The increased focus on renewable energy in this planning area also increases the importance of the WREZ process, which will incorporate information and address these issues on a west-wide scale. Accordingly, the Solar PEIS should coordinate with this parallel effort, and in particular, incorporate information and data when there is consensus reached between the environmental, renewable energy industry and utility and other stakeholders on zones/areas that are appropriate for large-scale solar energy development on public lands.

The West-wide Energy Corridors PEIS is a joint planning process among the DOE, BLM, USFS, and DOD. It intends to designate appropriate transmission corridors on public lands in the West. The West-wide Energy Corridor PEIS is of particular relevance to the Solar PEIS. These two processes should be viewed as an opportunity for synergy and as an opportunity to bring more renewable energy into the American electricity grid while minimizing environmental degradation. If both energy corridors and solar energy development projects are properly sited and renewable technologies such as solar, wind, and geothermal energy are given preference in new transmission rights-of-way within the corridors, these efforts together can help America reduce its reliance on the fossil fuels responsible for global climate change. Currently, the West-wide Energy Corridor PEIS is the subject of significant controversy, due to the failure to assess the need for corridors to support renewable energy, as well as the failure to avoid ecologically important areas.

In considering how areas suitable for solar development will relate to designated west-wide energy corridors, it would be better to coordinate the current WWEC PEIS with the Solar PEIS and have a set of energy corridors that focuses on delivering renewables to major market centers. In other words, analyzing in the current Solar PEIS whether "additional" or "separate" west-wide energy corridors should be designated to facilitate solar development may lead to duplicative corridors and unnecessary lands, wildlife and natural resource impacts.

In addition, the WGA has recently produced the Wildlife Corridors Initiative Report (available at http://www.westgov.org/wga/publicat/wildlife08.pdf), which identifies important wildlife corridors and habitats in the western states and makes recommendations for best protecting these crucial areas. BLM should consult this report for information on the areas identified and/or confer with the WGA Western Wildlife Habitat Council while preparing the PEIS.

The aforementioned planning projects and others currently underway in the West provide the BLM with an important opportunity in the form of a plethora of reliable information and planning partners. These resources should be utilized in order to maximize efficiency of solar energy while minimizing impacts to landscapes and wildlife.

H. Coordinate with Tribal Governments and Provide Strategies for Protection of Traditional Uses

BLM should make diligent efforts to consult with Native American tribal governments to determine whether there are sites or specific areas of particular concern, including sites of traditional religious and cultural significance, and incorporate this information into the PEIS. Tribes can also benefit economically from clean energy development and this is a good alternative to traditional extractive industries and the environmental and health impacts they have on native people. *See, e.g.*, http://www.grandcanyontrust.org/programs/native/programs2.php for a discussion of beneficial wind energy projects on tribal lands.

I. Take Into Account Protection of Cultural Resources and Engage in Required Consultation

FLPMA obligates the BLM to protect cultural, geologic, and paleontologic resource values. 43 U.S.C. §§ 1701(a)(8) 1702(c). In the context of historical and cultural resources, the National Historic Preservation Act of 1966 ("NHPA") (16 U.S.C. § 470 et seq.) affords heightened protection to these resources, establishing a cooperative federal-state program for the protection of historic and cultural resources. In particular, the review process set out in Section 106 (16 U.S.C. § 470f) obligates the BLM to consider the effects of management actions on historic and cultural resources listed or eligible for inclusion under NHPA. Additionally, Section 106 requires the BLM to consider the effects of its management actions on all historic resources and to give the Advisory Council on Historic Preservation an opportunity to comment before the BLM takes action. Section 110 of the NHPA requires the BLM to assume responsibility for the preservation of historic properties it owns or controls (16 U.S.C. § 470h-2(a)(1)), and to manage and maintain those resources in a way that gives "special consideration" to preserving their historic, archaeological, and cultural values. Section 110 also requires the BLM to ensure that all historic properties within the National Monument are identified, evaluated, and nominated to the National Register of Historic Places. *Id*. § 470h-2(a)(2)(A).

Further, the President's "Preserve America" initiative (*See* Exec. Order 13287, March 3, 2003) requires the BLM to advance the protection, enhancement, and contemporary use of its historic properties. The BLM must ensure that "the management of historic properties in its ownership is conducted in a manner that promotes the long-term preservation and use of those properties as Federal assets."

The BLM should take the opportunity to proactively consult and obtain information on cultural and historical resources in the areas proposed to be available for solar development so that there irreplaceable resources are identified and protected.

J. Recognize Special Importance of Public Lands to People Who Live in Nearby Communities and to Nation as a Whole

Extensive research exists demonstrating the key role that wildlands play in the vitality of nearby communities. The Wilderness Society released a report in 2007 entitled "Natural Dividends: Wildland Protection and the Changing Economy of the Rocky Mountain West" (available at www.wilderness.org and attached) that documents the importance of wilderness landscapes to western economies and provides additional references. Wildlands are also valued as places to visit and learn about for all Americans. The PEIS should acknowledge these values and take them into account as part of considering whether the benefits from use of an area of public land for solar energy development are sufficient to justify the long-term loss of that same land to citizens. A more detailed socioeconomic analysis is provided in Section IV.

K. Encourage Public Participation

We encourage BLM to maximize public involvement in preparation of the Solar PEIS. In addition to the public comment periods required by NEPA and BLM's regulations, there are other opportunities throughout the planning process for public involvement, which are used by many BLM offices. Public involvement allows the public to provide useful information and bring concerns to BLM's attention throughout the planning process, which improves the planning process and also can avoid controversy.

The BLM has identified the need to ensure sufficient data is available. In this context, we would also note that other BLM offices have made inventory data available to the public to assist in identifying new data needs and also made base data available for public use, and encourage BLM to take similar action in preparing the solar PEIS. By way of example, along with its release of the Draft RMP, the BLM's Arizona Strip Field Office provided zipped GIS files for all data layers needed to create the maps contained in the Draft RMP (and can be viewed on-line at http://www.blm.gov/az/GIS/files.htm#strip). The server space required for this operation is minimal and without this information, effective public participation in this process is severely hampered. GIS data for the West-wide Energy Corridors PEIS was also released to the public, allowing for more informed participation. This type of public participation is also consistent with the BLM's Land Use Planning Handbook (H-1601-1), which states that, "Documentation supporting the AMS [analysis of the management situation] should be maintained in the field office for public review" (Section III.A.4) and that, "Alternatives should be developed in an open, collaborative manner, to the extent possible" (Section III.A.5).

Many offices are providing a preliminary range of alternatives prior to formally releasing a Draft RMP, which gives the public a chance to provide input. After the comment period on the Draft, making analyses available before issuing the Final PEIS is another excellent way to increase public understanding of and participation in the PEIS process. The Kemmerer (Wyoming) Field Office, for example, has made their analysis of comments submitted on the Draft RMP and their ACEC evaluations public by posting them on their website, even though they have not yet issued the Proposed RMP/FEIS[1]. Making such analyses available to the public before the publication

[1] http://www.blm.gov/rmp/kemmerer/docs.htm

of the Draft PEIS will better prepare participants to understand the complex analyses and large amounts of data in the Draft PEIS and increase the relevance and usefulness of comments and other public participation. Making sure the public fully understands the proposed plans will also decrease conflict later in the process. We hope to see these types of opportunities provided to the many members of the public who are interested in the development of the solar PEIS.

The BLM should make every attempt to encourage the public to participate in the PEIS process including holding workshops, providing interim information regarding inventories of wilderness-quality lands and visual resources, posting GIS files, and posting analysis of comments submitted on the Draft PEIS to the PEIS website.

L. BLM Can Develop Protective Management Prescriptions for Lands with Wilderness Characteristics and Will Consider Public Input Regarding Lands to be Managed to Maintain Wilderness Characteristics

The Solar PEIS presents an opportunity for the BLM to consider information that it has received regarding lands with wilderness characteristics in the six states included in the PEIS, including inventorying these lands. The lands at issue in this PEIS contain numerous areas proposed for wilderness designation in citizen's wilderness inventories and/or found to have wilderness characteristics. Applicable law and current BLM policy provide for ongoing inventory of wilderness characteristics and management to protect wilderness characteristics through management prescriptions or other administrative designations on BLM lands, including as a priority over other uses.

Further, the April 2003 settlement agreement (Utah Settlement) between Secretary of the Interior Norton and the State of Utah (in which BLM abdicated its authority to designate any additional Wilderness Study Areas (WSAs)), does not affect BLM's obligation to value wilderness character or its ability to protect it, including in management prescriptions which would also merit exclusion of solar energy projects. We maintain that this agreement is invalid and will ultimately be overturned in pending litigation. Recently, a federal court in Utah revoked its approval of the Utah Settlement, stating that its approval of the initial settlement was never intended to be interpreted as a binding consent decree. Recognizing that the court's decision undermined the legal ground for the Utah Settlement, the State of Utah and the Department of Interior have now formally withdrawn the settlement as it was originally submitted. *See*, Motion to Stay Briefing and for a Status Conference, September 9, 2005, copy attached. This casts serious doubt upon BLM's current policy not to consider designating new WSAs. Because the State of Utah and the Department of Interior have withdrawn their settlement and do not intend to seek a new consent decree, there is currently no binding consent decree and the BLM has not even issued any updated guidance seeking to continue applying this misguided, and illegal, policy. [2]

The Instruction Memoranda (IMs) 2003-274 and 2003-275, which formalize BLM's policies concerning wilderness study and consideration of wilderness characteristics in the wake of the settlement contemplate that BLM can continue to inventory for and protect land "with wilderness

[2] Consequently, IM Nos. 2003-274 and 2003-275, which are explicitly based on an April 2003 settlement that no longer exists, are arguably invalid and do not apply to restrict BLM from designating new WSAs.

characteristics," such as naturalness or providing opportunities for solitude or primitive recreation, through the planning process. The IMs further provide for management that emphasizes "the protection of some or all of the wilderness characteristics as a priority," even if this means prioritizing wilderness over other multiple uses. This guidance does not limit its application to lands suitable for designation of WSAs; for instance, the guidance does not include a requirement for the lands at issue to generally comprise 5000-acre parcels or a requirement that the lands have all of the potential wilderness characteristics in order to merit protection. IM 2003-274 states that "BLM may continue to inventory public lands for resource or other values, **including wilderness characteristics**" and that the agency can "**manage them using special protections** to protect wilderness characteristics." (emphasis added). Further, IM 2003-275, Change 1, reads:

> The BLM can make a variety of land use plan decisions to protect wilderness characteristics, such as establishing Visual Resource Management (VRM) class objectives to guide the placement of roads, trails, and other facilities; establishing **conditions of use to be attached to permits, leases, and other authorizations to achieve the desired level of resource protection**; and designating lands as open, closed, or limited to Off Highway Vehicles (OHV) to achieve a desired visitor experience. (emphasis added).

Accordingly, administrative protection can and should be considered for lands not currently protected. In addition, the information submitted regarding citizen-proposed wilderness constitutes significant new information that must be addressed in this RMP revision. This information has not yet been analyzed in the existing land use plan, so NEPA requires analysis of the potential environmental direct, indirect and cumulative effects of oil and gas development on these areas and consideration of protection for them. *See*, 40 C.F.R. § 1502.9(c); Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 374 (1989). In a recent decision, the U.S. District for the District of Utah found that information regarding wilderness characteristics that was not considered in the existing land use plan was:

> **a textbook example of significant new information** about the affected environment (the **wilderness attributes and characteristics** of the Desolation Canyon, Floy Canyon, Flume Canyon, Coal Canyon, and Flat Tops unit) that would be **impacted by oil and gas development**; information that was **not reflected in BLM's existing NEPA analyses**.

Southern Utah Wilderness Alliance v. Norton, 457 F. Supp. 2d 1253 (D. Utah 2006) (attached). A compliant NEPA analysis requires not only assessment of potential impacts but also a consideration of potential mitigation measures, such as protecting lands with wilderness characteristics. 40 C.F.R. §§ 1502.14, 1502.16. The PEIS can and must consider protective measures tailored specifically to protect lands with wilderness characteristics as part of the RMP amendments.

Prior to identifying sites appropriate for solar development, we recommend that the agencies assess information received regarding wilderness characteristics, including inventorying lands identified, and exclude lands with wilderness characteristics, citizen-proposed wilderness, and

wilderness inventory units from the lands available for consideration of siting solar energy projects.

M. Environmental Protection and Energy Production are Both Desirable and Necessary, Not Mutually Exclusive

While we agree that these goals are not mutually exclusive, BLM is legally obligated to ensure protection of the environmental resources which it manages. For instance, FLPMA requires that: "In managing the public lands the [Secretary of Interior] shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. §1732(b). FLPMA also mandates that the public lands be managed "without permanent impairment of the productivity of the land or quality of the environment." 43 U.S.C. 1702(c). Similar obligations to prioritize protection of the environment and other resources of the public lands arise are contained in the Clean Air Act, Clean Water Act, Endangered Species Act, and National Historic Preservation Act. In complying with these laws, environmental protection must be given priority.

N. Consider and Analyze Climate Change Impacts, Including Anticipated Benefits from Solar

We support the BLM's recognition of the importance of analyzing the effects of its action on climate change. Global climate change is now acknowledged to be a major consideration for effects of major federal actions. The Supreme Court has concluded that "[t]he harms associated with climate change are serious and well recognized." Massachusetts v. E.P.A., 127 S.Ct. 1438, 1455 (2007). Further, the Supreme Court has held that while agency action may not completely reverse global warming, it does not relieve the agencies of the responsibility to take action to reduce it. Id. at 1458. In fact, an order issued by the Secretary of the Interior requires that:

> Each bureau and office of the Department will consider and analyze potential climate change impacts when undertaking long-range planning exercises, when setting priorities for scientific research and investigations, when developing multi-year management plans, and/or when making major decisions regarding the potential utilization of resources under the Department's purview.

U.S. Dept. of the Int., Sec. Order No. 3226 (Jan. 19, 2001), Section 3.

While there are many anticipated benefits to solar energy production over fossil fuels, the PEIS must address the potential for solar energy to have adverse impacts on climate change. For example, many western landscapes are already becoming increasingly fragile due to global climate change – especially desert landscapes that also have solar energy potential. In addition, these landscapes have important value as carbon "sinks," which could be lost if they are developed.[3] Further, undeveloped land has value as potential habitat as wildlife migrates to respond to climate changes. The destruction of these lands for solar energy production would thus contribute to the negative impacts of climate change. The PEIS should seek to mitigate

[3] *See, e.g., Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle?*, Science, Vol. 320, pp. 1094-140 (June 13, 2008) (attached).

negative impacts on climate change through the designation of appropriate lands open to solar energy development.

In order to properly analyze the impact solar development will have on climate change, the process must be considered as a whole. The savings in carbon emissions that a solar energy project provides may be significantly reduced or cancelled out depending on how much carbon is emitted in the construction phase or in transporting workers and supplies to a site. Therefore, in assessing impacts to climate change, BLM must analyze *net* emissions. An additional factor to consider is whether fossil fuels will be transmitted on lines designated for solar energy.

BLM must analyze net impacts of solar energy development on climate change and include consideration of landscapes and wildlife that already are or have the potential to be affected by climate changes. BLM should establish best management practices to mitigate potential climate change impacts. The Natural Resources Defense Council has included a detailed discussion of climate change in its comments and we incorporate those by reference herein.

O. BLM Will Use Geospatial Data in GIS to Facilitate Discussions of Affected Environment, Formulation of Alternatives, Analysis of Environmental Consequences, Display of Results

1. Lands with wilderness characteristics and proposed wilderness: GIS layers needed to complete the PEIS.

Prior to identifying areas appropriate for solar energy development as part of the PEIS, it is imperative that the agencies gather the necessary information to ensure that wilderness quality lands are not disturbed. The agencies have before them a unique opportunity to act as stewards of the public domain on a southwest-wide scale. By collecting and using appropriate GIS data layers before considering appropriate places for solar development, the agencies can ensure that they avoid disturbing our nation's wild places. **We recommend that the agencies collect and use the following GIS data layers to map areas that are unacceptable for siting corridors and in siting corridors to avoid impacting the identified areas:**

Citizen Proposed Wilderness Areas: The attached GIS layers document the most current citizen wilderness proposals and wilderness inventory units for Arizona, California, Colorado, New Mexico, and Utah. No comprehensive GIS layer exists for Nevada, so BLM should consult with the Nevada Wilderness Project (contact information below) to ascertain current proposal boundaries and areas of concern.

State	Contact Information
Nevada	**Address:** John Tull Nevada Wilderness Project 8550 White Fir Street Reno, NV 89523 **Website:** http://www.wildnevada.org **Phone:** (775) 746-7850 **Email:** john.tull@wildnevada.org

Many lands with wilderness characteristics have been inventoried and mapped by BLM field offices as part of RMP revisions. BLM should use this data to identify exclusion areas for solar development. Further, in identifying additional lands with wilderness characteristics, BLM should use GIS mapping to identify exclusion areas, and the agency should make these data layers available to the public as part of their PEIS.

2. Other GIS layers needed to complete the PEIS

As stated above, because the siting of solar energy development will have significant and long lasting impacts on public lands, it is critical that the agency gather, analyze, and make available to the public any GIS layers which describe sensitive or protected areas. In addition to the lands with wilderness characteristics, citizen proposed wilderness, and wilderness inventories discussed above, we recommend that the agencies **collect and use the following GIS data layers to map areas that are unacceptable for siting solar energy projects and in siting projects to avoid impacting the identified areas:**

1. Designated Wilderness Areas;
2. Wilderness Study Areas;
3. National Monuments;
4. National Conservation Areas;
5. Other lands within BLM's NLCS;
6. National Historic and National Scenic Trails;
7. National Wild, Scenic, and Recreational Rivers, study rivers and segments, and eligible rivers and segments;
8. ACECs;
9. Threatened, endangered and sensitive species habitat (available from USFWS[4], state wildlife agencies and, for BLM lands, from NatureServe[5]; critical cores and linkages for wildlife habitat (available from USFWS and state wildlife agencies, including in State Wildlife Action Plans, as well as the Wildlands Project and its affiliated regional organizations[6]) important bird areas (available from BLM and the National Audubon Society[7]); and
10. Riparian areas (available from SWReGAP[8], except for California, which is available from the UCSB Biogeography Lab[9]).

---

[4] http://www.fws.gov/southwest/es/newmexico/ES_home.cfm

[5] NatureServe was contracted to identify and map locations of threatened and endangered species habitat that exist only on BLM lands – making these areas even more critical to the survival of the species. This data can be found at www.natureserve.org

[6] http://www.twp.org/cms/page1158.cfm

[7] http://www.audubon.org/bird/IBA/

[8] http://ftp.nr.usu.edu/swgap/

[9] http://www.biogeog.ucsb.edu/projects/gap/gap_home.html

Recommendations: The PEIS should apply the proposed planning criteria with the additional clarification provided above.

IV. Issues for Further Analysis

As stated in the Notice of Availability:

> As currently envisioned, the PEIS will evaluate direct, indirect, and cumulative impacts to wildlife, wildlife habitat, threatened and endangered species, and vegetation; proximity to wilderness or other special management areas; and impacts to cultural, paleontological, socioeconomic, visual, and water resources. These resources are recognized as significant issues associated with utility-scale solar energy development.

We support the issues identified above and in the proposed planning criteria as those that could lead to significant impacts and/or merit further, in-depth analysis in the PEIS. We have highlighted certain additional issues below for further discussion of the analysis required.

A. Lands with Wilderness Characteristics

As discussed above, the Solar PEIS provides an opportunity for the BLM to evaluate information regarding lands with wilderness characteristics and to take necessary steps to protect those characteristics.

Recommendation: The PEIS should evaluate information on wilderness characteristics and, where necessary, inventory its lands to confirm the existence of wilderness characteristics, then consider alternatives to protect some of all of these characteristics, and incorporate appropriate management prescriptions into the PEIS and resulting RMP amendments.

B. Protection of Wildlife Habitat

Significant portions of the land that will be considered for solar energy development in the PEIS contain core habitat areas and migration linkages between those core areas, all of which need to be preserved in order for the regional ecosystems to continue to function. Fragmentation of wildlife habitat affects the ecological composition, structure, and functions of a landscape. Habitat fragmentation has been defined as the "creation of a complex mosaic of spatial and successional habitats from formerly contiguous habitat" (Lehmkuhl and Ruggiero 1991). **Although fragmentation can be difficult to measure, there are a variety of metrics that can be used to assess the degree of existing habitat fragmentation and the condition of the landscape, then applied to available data regarding distribution of wildlife and habitat, and ultimately used to make decisions regarding appropriate locations for energy corridors. We recommend that the agencies complete such an analysis as part of the PEIS.**

Existing road density can be calculated by measuring the length of linear features in a given sub-area at regular intervals and then reported as miles of route per square mile (mi/mi^2). The degree of habitat fragmentation, the distribution of unroaded areas, or core areas, can also be measured and calculated based on the amount of land beyond a given distance or effect zone, from transportation routes (Forman, 1999). Wildlife species respond to disturbances related to this type of network at varying distances, so determining the size distribution of core areas for a

range of effect zones (i.e., of 100ft, 250ft, 500ft and 1320ft) from all routes is also important. Wildlife literature will yield information on the effect zones for different species. For instance, an ongoing study by Sawyer et al. (2005, 2004, 2001) of GPS collared deer on the Pinedale Anticline observed that deer utilized habitat progressively further from roads and well pads over three years of increasing gas development and showed no evidence of acclimating to energy-related infrastructure. Birds are also impacted by roads and management practices associated with energy development, due to fragmentation, changes in vegetation and noise (Mabey and Paul, 2007; Robel, et al., 2004).

In addition to solar energy plants themselves, habitat fragmentation can be caused by transmission corridors, which will be necessary to transmit solar power to electricity grids. Wildlife habitat fragmentation caused by transmission lines (including branch powerlines), pipelines (including feeder pipelines) and roads generally fall into three broad categories:

1. Construction impacts (access, right-of-way clearing, construction of towers, stringing of cables);
2. Line maintenance impacts (inspection and repair); and
3. Impacts related to the physical presence and operation of the transmission line.

As such, wildlife habitat must be examined on an individual project and site-specific basis. The only way to accomplish this requirement is to ensure that each individual solar project is spatially evaluated for direct, indirect and cumulative impacts.

Specific activities that negatively impact wildlife and cause destruction of core habitat or habitat fragmentation include the construction of facilities, blading and scraping of the ground, disturbance of soil by the use of heavy machinery, noisy machinery during construction and maintenance, noise from helicopters, removal of vegetation, blasting, filling depressions (a.k.a. recontouring the landscape), disposal of waste and chemicals on site, use of herbicides, and the use of borrow pits.

The effects of these activities on wildlife can be severe and include removal of habitat, fragmentation of habitat, and the creation of edge effect vegetation and habitat (changes in composition, structure, microclimate, etc. of area adjacent to facility and transmission corridor). Species shown to avoid edges include red-backed vole, snowshoe hair, pine marten and red squirrels. In addition, it is logical to suspect that construction of facilities and transmission in previously undisturbed areas will lead to a direct loss of life to wildlife during construction, operation and service of transmission lines.

We have included The Wilderness Society's most recent Science and Policy Brief, "Habitat Fragmentation from Roads: Travel Planning Methods to Safeguard BLM Lands" (Appendix 1). Also included in Appendix 1 are four scientific reports prepared by TWS and discussed in the habitat fragmentation report. These include *Fragmenting Our Lands: The Ecological Footprint from Oil and Gas Development, Protecting Northern Arizona's National Monuments: The Challenge of Transportation Management, Wildlife at a Crossroads: Energy Development in Western Wyoming,* and *Ecological Effects of a Transportation Network on Wildlife.* In addition to summarizing the four reports included, "Habitat Fragmentation from Roads: Travel Planning

Methods to Safeguard BLM Lands" provides a summary of available scholarly and government reports and studies on the impact of habitat fragmentation on wildlife, provides methods for calculating habitat fragmentation, and provides recommendations on how to integrate fragmentation analysis into management.

***Recommendation*:** BLM should use the information provided in Appendix 1(as well as related information from State Wildlife Action Plans, Audubon Important Bird Areas, and the Wildlands Network) to identify core areas, measure habitat fragmentation, conduct a thorough fragmentation analysis, and inform decisions regarding designation of lands as available for solar energy in the PEIS, as well as incorporating these requirements into the PEIS to guide analysis of specific projects.

C. Special Management Areas

The Notice of Availability identified a number of different types of special management areas where utility-scale solar development is not appropriate. Areas in the National Landscape Conservation System are governed by other laws requiring protection as a priority.

- National Monuments are generally reserved by Presidential proclamation under the Antiquities Act of 1906 (16 U.S.C. § 432) to protect objects of historic or scientific interest, and must be managed to protect those values as a priority over other uses.

- National Conservation Areas are designated for the express purpose of protecting other natural values and management priorities are set out in enabling legislation.

- Section 10(a) of the Wild and Scenic Rivers Act provides similar management direction for wild and scenic river segments:

  > Each component of the national Wild and Scenic Rivers System shall be administered in such manner as to **protect and enhance the values which caused it to be included in said system** without, insofar as is consistent therewith, **limiting other uses that do not substantially interfere with public uses and enjoyment of these values**.

- .National Historic Trails closely follow a historic trail or route of travel of national significance in order to identify and protect their history for public enjoyment. National Scenic Trails provide maximum outdoor recreation potential and to support the conservation and enjoyment of the various qualities – scenic, historical, natural, and cultural – of the areas they pass through. *See, e.g.*, BLM website on National Scenic and Historic Trails (http://www.blm.gov/nlcs/nsht/). The purpose for which the trails were created, as summarized in the National Trails System Act, is "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation." 16 U.S.C. § 1241(a).

- BLM is obligated to manage the WSAs in accordance with the Interim Management Policy (IMP) for Lands Under Wilderness Review (BLM Manual H-8550-1), which requires that WSAs are managed to protect their wilderness values. The IMP requires the BLM to manage WSAs in accordance with the nonimpairment standard, such that no activities are allowed

that may adversely affect the WSAs' potential for designation as wilderness. As stated in the IMP, the "overriding consideration" for management is that:

> . . . preservation of wilderness values within a WSA is paramount and should be the primary consideration when evaluating any proposed action or use that may conflict with or be adverse to those wilderness values. (emphasis in original)

The IMP also reiterates that WSAs "must be managed to prevent unnecessary or undue degradation."

- FLPMA requires the BLM to "give priority to the designation and protection of areas of critical environmental concern [ACEC]." 43 U.S.C. § 1712(c)(3). ACECs are areas "where special management is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes." 43 U.S.C. § 1702(a).

Recommendation: The BLM is required to prioritize management to protect and enhance conservation values for special management areas, which is inconsistent with the development of solar energy development; these areas should be excluded from availability.

D. Socioeconomic Impacts

The socioeconomic impacts of potential solar energy development go far beyond the value of the electricity produced by such projects or the construction, operation and maintenance jobs which may be created. While certainly beneficial in our national quest for renewable energy and our important goal of reducing global warming pollutants, solar energy projects (as is the case with all industrial developments) will leave permanent impacts on the landscape of the West – a landscape which is both iconic and an important economic driver in this region. The public lands that may be impacted by solar energy projects enabled by the Solar PEIS are likely to include places which are important and valuable to all Americans. Development of these lands for solar energy development should be considered carefully and should account for all their potential values – both market and non-market. Only those projects that result in the highest and best use of our valuable open lands should be pursued.

Several specific areas of analysis which we feel should be addressed in the Solar PEIS are noted here and discussed in more detail below.

1. In developing criteria and priorities for approval of solar energy projects on public lands, the BLM and DOE should favor those projects which provide the greatest net benefits to the American public, by accounting for all the potential costs and benefits associated with such development.
    a. The Solar PEIS should address the potential benefits to the local area economies that arise from these undeveloped public lands, and which will be impacted by the development of solar energy projects and related transmission corridors.
    b. All opportunity costs of energy development on public lands should be fully examined in the Solar PEIS. The relative impacts of different power-generation

techniques should be compared and evaluated to ensure that net socioeconomic value of a project is maximized.

c. The Solar PEIS should include an assessment of the potential benefits of siting utility scale solar projects on private lands compared with development on public lands. The potential fiscal returns to the American public from siting on public lands should be compared with the potential fiscal benefits that might accrue to a private landowners through siting solar facilities on private lands (ROW, rental fees)

d. The Solar PEIS should consider the benefits as well as mitigation of costs by siting solar energy facilities on Brownfields. By avoiding costs to the ecological integrity and outdoor opportunities, the net benefits of siting a solar project on contaminated lands may be considerable.

2. The Solar PEIS should account for all conceivable non-market values, including the impacts on local quality of life, which are associated with the undeveloped public lands that may be impacted by solar energy development.

3. The socioeconomic analysis in the Solar PEIS should avoid the use IMPLAN and economic base models to assess the economic impacts of the proposed solar energy development and related transmission corridors on local communities. If the use of such models is unavoidable, these should not be the sole analytical tool for assessing the economic impacts. The socioeconomic analyses should asses the potential impacts of utility-scale solar energy projects and related transmission corridor development on local economies and residential and other private property values.

1. <u>Utility-scale solar energy development should maximum net public benefits.</u>

In developing criteria and priorities for approval of solar energy projects on public lands, the BLM and DOE should favor those projects which provide the greatest net benefits to the American public, by accounting for all the potential costs and benefits associated with such development.

We expect that the Solar PEIS will recognize that solar energy development, like any industrial development sited on public lands, will have negative impacts on these lands. These impacts may be as great as those associated with other energy development; however, we also recognize that the production and use of solar energy, if it replaces that of fossil fuel energy, will also have benefits. These include the lessening of greenhouse gas emissions from electricity production which, in turn, will be beneficial to undeveloped public lands by reducing the already measureable impacts of climate change.

At the same time, in light of climate change, undeveloped public lands are also increasingly important as a source of habitat for species impacted by climate change, as a source of forest and other vegetation which acts as a "carbon sink" and is thus important for mitigation of climate change. Undeveloped lands are also a source of increasingly scarce clean water and other ecosystem services. Solar energy development projects sited on undeveloped lands (both public and private) will reduce these benefits. These costs should be included in the Solar PEIS's assessment of net public benefits.

The Solar PEIS should recognize that not all solar energy development projects will produce the same type and level of public benefits and costs. Emphasis and priority should be given to those

projects which produce the largest net benefits, accounting for both market and non-market impacts on the public, the ecosystem, and the climate change mitigating abilities of western lands, both public and private.

a. Benefits to the Local Economy from Undeveloped Public Lands

The Solar PEIS should address the potential benefits to the local area economies that arise from undeveloped public lands which may be impacted by the development of utility-scale solar energy projects and related transmission corridors. The mere presence of undeveloped public lands and the natural and recreational amenities that they provide produce measurable economic benefits for local communities.

The Solar PEIS should fully address the impacts that utility-scale solar energy development on undeveloped public lands will have on the local economies throughout the study area. The economic benefits of undeveloped lands for local economies is well documented and has grown in importance as the U.S. moves from a primary manufacturing and extractive economy to one more focused on service sector industries. This shift means that many businesses are free to locate wherever they choose. The "raw materials" upon which these businesses rely are people, and study after study has shown that natural amenities attract a high-quality, educated and talented workforce – the lifeblood of these businesses.

As the economy of the West evolves, public lands, especially areas protected from development, are increasingly important for their non-commodity resources – scenery, wildlife habitat, wilderness, recreation opportunities, clean water and air, and irreplaceable cultural sites. A vast and growing body of research indicates that the economic prosperity of rural Western communities depends more on the natural amenities found on public lands and less on the extraction of natural resource commodities.[10] In a letter to the President and the Governors of all the Western states, 100 economists from universities and other organizations throughout the United States pointed out that, "The West's natural environment is, arguably, its greatest long-run economic strength" (Whitelaw et al. 2003).

New residents in the rural West often bring new businesses, and these are rarely tied to resource extraction. Some are dependent directly on the recreation opportunities on the surrounding public lands. Entrepreneurs are also attracted to areas with high levels of natural amenities. The Federal Reserve Bank of Kansas City has found that the level of entrepreneurship in rural communities is correlated with overall economic growth and prosperity (Low 2004). These businesses may be harmed or deterred if the quality of the scenic and natural amenities is degraded due to solar energy developments. The Solar PEIS must assess the value of undeveloped public lands and include criteria which will ensure that the economic role of these lands is not deterred when solar energy developments and any associated transmission lines are constructed.

Retirees and others who earn non-labor income are also important to rural western communities. Non-labor income makes up an average of 27% of total personal in the six-state region covered

---

[10] *See* Whitelaw and Niemi 1989, Rudzitis and Johansen 1989, Johnson and Rasker 1993 and 1995, Freudenburg and Gramling 1994, Snepenger et al. 1995, Deller 1995, Power 1995 and 1996, Bennett and McBeth 1998, Duffy-Deno 1998, McGranahan 1999, Nelson 1999, Rudzitis 1999, Morton 2000, Lorah 2000, Deller et al. 2001, Johnson 2001, Shumway and Otterstrom 2001, Lorah and Southwick 2003, Rasker et al. 2004, Holmes and Hecox 2004 and Reeder and Brown 2005, Sonoran Institute 2006, and Barrens et al. 2006 for some examples. See Haefele et al. (2007) for a detailed description of the research on the amenity economy and the ways in which local economies benefit from protected public lands.

by the Solar PIES.[11] If investment and retirement income were considered an industry it would be one of the largest in all of the states potentially impacted by proposed utility-scale solar energy development. Retirees are attracted by natural amenities that are available on undeveloped public lands. The potential impact that solar energy development will have on this source of income and economic activity must be accounted for in the Solar PEIS.

Growth in the professional and service sector is also tied to the natural and other amenities in the area. Protected public lands in the region enhance the West's attractiveness for both skilled workers and employers. Protected public lands provide indirect support for local and regional economies, a fact that is increasingly being recognized by communities throughout the West. These lands provide a scenic backdrop, recreation opportunities and a desirable rural lifestyle, and many other tangible and intangible amenities that attract new residents, businesses and income to the rural West. Many businesses are able to conduct national or international commerce from any location they choose. Other entrepreneurs simply choose to live in a particular place and build businesses in response to local needs. Research conducted by The Center for the Study of Rural America, at the Federal Reserve Bank of Kansas City (the Rural Center) has found that entrepreneurship is a strong indicator of rural economic health (Low 2004, Low et al. 2005, Thompson et al. 2006). The Rural Center has included entrepreneurship along with several other indicators of rural economic potential into a set of Regional Asset Indicators. These indicators include the natural and human amenities of a region – many of which are closely tied with undeveloped public lands (Weiler 2004). The six states included in the proposed Solar PEIS all have levels of human and natural amenities which are higher than the national average due in part to protected and undeveloped public lands. The role of these lands in the area's economy and the potential impact that solar energy development might have should be addressed in the Solar PEIS (Center for the Study of Rural America 2006a).

Research into what motivates entrepreneurs and businesses to choose particular locations consistently finds that amenities and quality of life top the list (Rasker and Hansen 2000, Snepenger et al. 1995, Rasker and Glick 1994, Whitelaw and Niemi 1989). Developing the proposed utility-scale solar energy projects on undeveloped public lands may hinder western communities ability to attract more small businesses into the region to further enhance this sector.

These findings together point to the value of public lands to strong local economies. Development of solar energy projects on these western lands could be seriously problematic, and this must be addressed in the Solar PEIS. To site solar energy development in a way that impairs these natural amenities would be short-sighted at best. The Solar PEIS should address this issue and provide detailed criteria to protect the economic benefits associated with undeveloped public lands.

Recommendations: The Solar PEIS must include a thorough examination of the full socioeconomic impacts likely to occur if utility-scale solar energy projects impact undeveloped lands. Some suggested analyses and sources of data can be found in *"Socio-Economic Framework for Public Land Management Planning: Indicators for the West's Economy"* (**attached**).

[11] In Arizona, investment and retirement income is 27% of total personal income. This income is 25% in California, 24% in Colorado, 31% in Nevada, 27% in New Mexico and 24% in Utah. Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (http://www.bea.gov/)

b. Opportunity costs

All relative costs of solar energy development on public lands should be fully examined in the Solar PEIS, especially benefits to the public and local economies. As discussed above, there is potential for the loss of economic opportunity from tourism, hunting, fishing, wildlife viewing, and other forms of recreation if solar facilities are installed on lands that hold special value to people, wildlife, and other elements of the ecosystem. These costs should be assessed by the BLM or the DOE for every site on which there is a plan to construct and operate a solar power facility.

However, local communities can certainly benefit from the presence of new power-generating infrastructure. Temporary jobs are created to manufacture parts and to construct the power facility. Once up and running, permanent positions are also needed to operate and maintain the facilities. Table 1 presents estimates on employment information for different types of power-generating facilities.

Table 1. Annual Jobs Created Per Megawatt of Generating Capacity

Energy Source	Temporary Jobs(per MW)	Permanent Jobs(per MW)
Solar-PV[a]	1.2[1]-33[3]	0.25[1]-2.5[3]
Solar-CSP[b]	3.25[4]-10[5]	0.275[4]-1.0[5]
Central Solar*	3.42[2]	1.62[2]
Wind	0.15[1]-0.88[1]	0.1[1]
Coal	0.21[1]-3.57[4]	0.5[4]-0.59[1]
IGCC Coal	2.54[6]	0.36[6]
Gas	0.21[1]	0.6[1]

a) PV: Photovoltaic
b)CSP: Concentrated Solar Power
*Central Solar makes use of both PV and CSP technologies
[1] Daniel M. Kammen, Kamal Kapadia, and Matthias Fripp (2004) *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* RAEL Report, University of California, Berkeley. P. 10.
[2] Navigant Consulting, Inc. estimates, June 2006.
[3] Clean and Diversified Energy Initiative. Solar Task Force Report. January, 2006. Western Governors' Association.
[4]Suemedha Sood. Harnessing the Sun: The Future of Green Jobs. April 11, 2008. The Washington Independent. http://washingtonindependent.com/view/harnessing-the-sun
[5] Dr. Franz Trieb. Powerpoint: Concentrating Solar Power Now: Clean Energy for Sustainable Development. German Aerospace Center. P. 11. 2007
[6] Frequently Asked Questions. FutureGen Alliance, Inc. 2006. http://www.futuregenalliance.org/faqs.stm

Typically, construction of a power plant takes between 2 and 3 years. Even if we assume that a coal/gas power plant takes 30% longer to construct, solar facilities still provide more employment hours per MWh produced (Kammen, et al.). In addition, for every MW of power capacity, solar plants employ a greater number of workers than do fossil fuel-based facilities.

Integrated Gasification Combined Cycle (IGCC) coal power plants, however, are an exception. They have the potential to offer up to 3.4 more manufacturing/construction jobs per MW capacity than either normal coal or gas plants. This is directly linked to greater initial capital costs for an IGCC coal plant.[12] An IGCC coal facility requires the manufacture of more complex equipment, which also may require skilled installation. All of this raises the costs of providing electricity, which is then passed on to the consumer. However, as discussed above and below, clean energy such as solar power is likely to have higher net pubic benefits when the impacts associated with lower pollution levels are also considered.

The absence of harmful effluence is another serious benefit of implementing solar energy. For a single megawatt-hour (MWh) of energy, a coal plant may produce between 0.3 and 1.5 tons of carbon dioxide (Carma.org). Over a year at a run-of-the-mill coal plant, this comes to about 3.7 million tons of CO2 and thousands of tons of other effluent.[13] Natural gas combined cycle plants are one of the leading "clean" fossil fuel-based energy producers. Still, they emit about 1900 tons of CO2, 0.045 tons of CO, and 0.075 tons of NOx per MW of total capacity.[14] IGCC coal facilities boast near-zero emissions from the technologies they implement. CO2 effluence is largely eliminated, and SO2 and NOx effluence is considerably lower than standard coal/gas power plants. However, it is still effluence that could be curbed completely by using solar energy systems. In general, for every 1 MW of coal/gas power replaced by a renewable source: approx. 3,640 tons CO2, 9.2 tons SO2, 11.2 tons NOx is avoided.[15]

These emissions have costs beyond the impairment of ecological services. Each year, effluence affects people across the country. Annually, there are hundreds of thousands of hospital visits and millions of lost worker days attributed to gases and particulate emitted by fossil fuel-based power plants.[16]

There are a number of additional costs to coal/gas power facilities. First, the fuel required to generate electricity is a resource into which considerable resources must be invested. Recovering gas/oil/coal often requires seismic analysis to locate the resource. Then the fuel must be extracted, processed, and transported to where it is needed. Solar power plants require only natural sunlight, which costs nothing to locate or transport. Coal power plants also use copious quantities of water. Traditional facilities annually use about 4.4 million gallons of water for every MW of capacity.[17] IGCC plants may be worse, requiring up to 2500 gallons every minute.[18] Even if significant water recycling is performed, the need still ads up. Furthermore, both traditional and IGCC coal facilities release waste water. Even if this waste water complies

---

[12] EnergyJustice.net. Fact Sheet: "Clean Coal" Power Plants (IGCC). http://www.energyjustice.net/coal/igcc/factsheet-long.pdf

[13] Environmental Impacts of Coal Power: Air Pollution. Union of Concerned Scientists. August 18, 2005. http://www.ucsusa.org/clean_energy/coalvswind/c02c.html

[14] L. Stoddard, J. Abiecunas, and R. O'Connell. Economic, Energy, and Environmental Benefits of Concentrating Solar Power in California. National Renewable Energy Laboratory. April, 2006.

[15] Concentrated Solar Power. American Solar Energy Society, Solar Electric Division. www.ases.org/divisions/electric/facts_csp.pdf

[16] Data for U.S. Moving Toward Ban on New Coal-Fired Power Plants. Earth Policy Institute. February 14, 2008. http://www.earth-policy.org/Updates/2008/Update70_data.htm

[17] Environmental Impacts of Coal Power: Water Use. Union of Concerned Scientists. August 18, 2005. http://www.ucsusa.org/clean_energy/coalvswind/c02b.html

[18] Frequently Asked Questions. FutureGen Alliance, Inc. 2006. http://www.futuregenalliance.org/faqs.stm

with EPA standards, contaminants are still released into natural water systems.[19] On the other hand, a 100 MW CSP plant only requires about 815,000 gallons of water every year, and there is very little waste water.[20]

Land is another finite resource that is necessary for all types of infrastructure, including power facilities. Table 2 shows estimates of the acreage needed for every MW of capacity for different facilities.

Table 2. Acres Per Megawatt of Generation Capacity

Energy Source	Acres/MW
Solar-PV	2.47[7]-12.36[7]
Solar-CSP	5.0[10]-12.33[8]
Wind	24.71[7]-50[9]
Coal	0.35[9]-1.1[11]
IGCC Coal	1.31[12]-2.36[12]
Gas	0.29[13]-0.41[13]

[7] PV FAQ's. U.S. Department of Energy, Energy Efficiency and Renewable Energy. National Renewable Energy Laboratory. (www.hubbertpeak.com/Apollo2/photovoltaics/HowMuchLandNREL.pdf)
[8] Concentrating Solar Power: From Research to Implementation. European Commission. European Communities, 2007.(ec.europa.eu/energy/res/publications/doc/2007_concertrating_solar_power_en.pdf)
[9] Cure for the Common Coal: Can Wind Power Replace Traditional Fossil Power? Time2Time.June 3, 2008. (http://uva72.blogspot.com/2008/06/cure-for-common-coal-can-wind-power.html)
[10] Concentrating Solar Power. U.S. Department of Energy, Energy Efficiency and Renewable Energy. National Renewable Energy Laboratory. (solareis.anl.gov/documents/docs/NREL_CSP_1.pdf)
[11] Jonah Lamb. Killer Coal. Salt Lake City Weekly. May 3, 2007. (http://www.slweekly.com/index.cfm?do=article.details&id=1CA7B2DC-2BF4-55D0-F1FC484A425B4016)
[12] Final Site Selection Report. FutureGen Industrial Alliance, Inc. Submitted to Department of Energy, Dec. 18, 2007.
[13] Eleanor Charles. A Flurry of Proposals for Gas-Fired Power Plants. The New York Times. October 24, 1998. (http://query.nytimes.com/gst/fullpage.html?res=9507E6D8123DF937A15753C1A96E958260&sec=&spon=&pagewanted=all)

In this category, fossil fuel-based power facilities appear to more efficient. However, the land necessary to extract and process their respective fuel sources should be reviewed in any adequate cost/benefit breakdown. There are also the costs of reclaiming sites where coal, oil, and gas have been extracted. These cost taxpayers hundreds of millions of dollars every year.[21] Without considering all of the costs behind every unit of power produced, any analysis of costs and benefits is insufficient.

Regardless of the type of facility, there are some means of abating the costs of installing a power plant. Undeveloped lands may be worth considerably more to recreational purposes and the ecosystem than are lands that have already been disturbed from their natural states. Therefore,

[19] EnergyJustice.net. Fact Sheet.
[20] Ivapah Solar Electric Generating System. The California Energy Commission. July1, 2008. http://www.energy.ca.gov/sitingcases/ivanpah/index.html
[21] Data Tables and Figures. 2006 Annual Report. OSM/DOI Strategic Plan Measures. Office of Surface Mining. 2006. http://www.osmre.gov/annualreports/06AR11.pdf

locating new facilities and corridors near existing infrastructure keeps essentially all of the benefits of a facility located anywhere while simultaneously reducing the market and non-market costs of installing the new infrastructure.

Recommendations: In order to ensure that any proposed utility-scale solar energy development results in maximum net public benefits, the analysis of such development must account for the all opportunity costs. This includes the costs associated with siting utility-scale solar energy development on undeveloped public lands, and the resulting loss of economic benefits, as well as the potential jobs and income to local communities. The analysis should also compare the relative costs of other forms of energy development

c. Benefits of siting on private lands

Within a consideration of reasonable alternatives, the BLM should consider whether siting a power facility on private lands has greater potential benefits than the equivalent project on public holdings.

The goal of installing any type of power-generating facility is to benefit the public as much as possible. If installed on public lands, annual ROW rents are collected by the BLM. If installed on private lands, payments would more often go directly to the local community, and through multiplier effects, would contribute to the vitality of local economies (and in turn the respective state and then federal economies) more than if the rent were collected by the federal government. It is therefore necessary to consider the direct impact on local economies from a new power facility being sited on private as opposed to federal land within the larger socioeconomic analysis.

Recommendations: The Solar PEIS should include an analysis of the relative benefits of siting utility-scale solar energy developments on private lands rather than on public lands. If the financial return to a private landowner would be higher, the agency should give a higher priority to siting on private lands.

d. Benefits as well as mitigation of costs by siting on Brownfields

There are millions of acres of contaminated lands in the U.S.[22] Serious potential exists for installing renewable power generation infrastructure on these lands.

The conditions of many brownfields are particularly well-suited for the development and operation of power facilities. There are many sites where the ground is relatively level and significant vegetation is absent; much of this was done when these sites were originally established. In addition, most brownfields are located within 5 miles existing electricity transmission infrastructure, reducing the need to further impact the nearby area by developing transmission corridors.[23] Furthermore, most of these sites already exist in a "heavy industry" zoning classification that a power facility requires. This also provides access to established waste streams.[24]

---

[22] Powerpoint: Land-Based Initiatives and Climate Change. SRA International. EPA Land Revitalization Staff Office. June, 2007. http://www.authorstream.com/Presentation/Margherita-45877-NARUC-Pres-July-15-Land-Based-Initiatives-Climate-ChangeJune-2007-Opportunities-GHG-Education-ppt-powerpoint/

[23] Ibid.

[24] Energy Department Announces National Initiative to Redevelop Brownfields with Renewable Energy. U.S. Environmental Protection Agency. April 4, 2008. http://www.epa.gov/brownfields/html-doc/brightfd.htm

Installing renewable power infrastructure on brownfields also avoids many of the costs associated with developing open public and private lands. Ecological integrity and opportunities for recreation are already largely absent. In fact, many of these contaminated land sites can be improved. Progressive land restoration would improve environmental conditions and help to mitigate carbon emissions.[25]

Recommendations: The Solar PEIS and consideration of individual projects should include an analysis of the relative benefits of siting utility-scale solar energy developments on brownfields and other degraded lands, both public and private. The analysis should examine the net public benefits of siting on these lands relative to siting on undeveloped lands, especially undeveloped public lands which may be more important for the climate change mitigation properties, the provision of recreation opportunities, their role in local economies and their provision of passive use and other non-market values.

2. Non-market values should be included in the economic analyses

One of the most important purposes of public lands, including those administered by the Bureau of Land Management, is the provision of public goods or non-market goods. Opportunities for solitude, outdoor recreation, clean air, clean water, the preservation of wilderness and other undeveloped areas would be underprovided if left entirely to market forces.

In the assessment of the socioeconomic impacts of solar energy development, the Solar PEIS must account for the non-market values associated with undeveloped wild lands. The agencies implementing the Solar PEIS have an inherent responsibility to see that these lands are not impaired in order to ensure that the public goods they produce continue to be provided and in quantities that meet the demand of all U.S. citizens.

Non-market values have been measured and quantified for decades. There is a well-established body of economic research on the measurement of non-market values, and the physical changes (which result in decreases in the source of these values) brought about by development are very easy to measure quantitatively.

This analysis is especially important when considering actions which would degrade or damage roadless areas or other lands with wilderness characteristics since these lands produce benefits and values that are seldom captured in the existing market structure. The literature on the benefits of wilderness and other undeveloped lands is well-established and should be used by the BLM and DOE to estimate the potential value of these lands where utility-scale solar energy development is proposed. Krutilla (1967) provides a seminal paper on the valuation of wilderness and has led the way for countless others who have done additional research all providing compelling evidence that these lands are worth much more in their protected state. Morton (1999), Bowker et al. (2005), Krieger (2001) and Loomis and Richardson (2000) provide overviews of the market and non-market, use and non-use values of wilderness and wildlands. See Walsh et al. (1984), Bishop and Welsh (1992), Gowdy (1997), Cordell et al. (1998), Loomis and Richardson (2001) and Payne et al. (1992) for several more examples.

Peer-reviewed methods for quantifying both the non-market and market costs of changing environmental quality have been developed by economists and are readily applicable to solar energy development. For a catalog of these methods see Freeman (2003). For a complete socioeconomic analysis, agencies implementing the Solar PEIC should adapt these methods to

[25] Land-Based Initiatives and Climate Change. 2007.

conditions in each of the proposed solar energy locations to obtain a complete estimate of the economic consequences of development.

The socioeconomic analysis in the Solar PEIS must also adequately address the potential impacts on the quality of life for residents of communities that will be impacted by solar energy development. The quality of life in many communities with abundant protected public lands is often tied inextricably with those lands. Any negative impacts on these lands from solar energy development may deteriorate aspects of the western quality of life. As discussed above, such a decline will create more than simply emotional or psychological impacts. Areas with high quality of life are better able to attract the entrepreneurs, skilled and creative workers, retirees and others who are important economic drivers of many western communities.

Recommendations: The Solar PEIS must measure and account for changes in non-market values associated with solar energy development. To do otherwise omits a very important socioeconomic impact that would directly result from solar energy development. The analysis must assess the non-market economic impacts to all Americans, including the passive use values of undeveloped public lands.

The Solar PEIS must also include an assessment of impacts on the local quality of life that are may result from utility-scale solar energy development on surrounding public lands. The potential resulting economic impacts of any decline in quality of life must also be assessed in order to fully evaluate the proposed development.

3. Recommended methods for socioeconomic analyses

a. Economic base models

The use of economic base models such as IMPLAN is insufficient to predict future economic impacts from solar energy development. While these models can be useful as a tool to develop static analyses of the regional economy, the agencies developing the Solar PEIS and local communities potentially impacted must be aware of the shortcomings and poor track record of such models as predictive tools. Economic base models do not consider the impacts of many important variables that affect regional growth in many rural communities, especially in the West. Attributes such as natural amenities, high quality hunting, fishing and recreational opportunities, open space, scenic beauty, clean air and clean water, a sense of community, and overall high quality of life are not measured or accounted for in economic base models, however these amenities are associated with attracting new businesses and migrants as well as retaining long-time residents. Many residents of Western communities (both long-time and new) earn retirement and investment income, and while it is technically possible, most economic base models completely fail to consider the important economic role of retirement and investment income.

Many economists have offered constructive critiques of the such models. See for example: Krikelas (1991), Tiebout (1956), Haynes and Horne (1997), Hoekstra, et al. (1990), Richardson, 1985 and the Office of Technology Assessment (1992). The ease of data acquisition for estimating the impacts of manufacturing, construction and resource extractive sectors combined with the difficulty of estimating the impacts of recreation and tourism underscores the potential bias favoring development in economic base models. The concern over the accuracy of these models combined with concern over the use of such models for planning, suggests that it is not

only inappropriate but a disservice to rural communities to rely on economic base analyses to estimate the economic impacts of public land management on rural communities.

***Recommendations*:** We recommend that the analysis performed for the Solar PEIS not rely solely on IMPLAN or on other models derived from economic base theory to predict the economic impacts of solar energy development. As these comments demonstrate the relationship between public land management and local and regional economic prosperity and growth is far more complex than these models assume, and given the potentially significant impacts on many of the region's public lands, use of such models will result in an incomplete and inadequate analysis of the socioeconomic impacts.

b. Estimation of the impacts to property values

There is a large body of work which looks at the positive impacts of open space and protected public lands on property values. These studies can be applied to infer the inverse decline in property values associated with the loss of protected public lands and open spaces that may occur when solar energy projects are sited on such lands. Numerous studies show that there is a positive correlation between property values and open spaces and protected public lands. Given that solar energy development may impact public land and open space throughout the six-state area, it is likely to have negative impacts on the property values in the region.

Several examples of such studies include Earnhart (2006), Bengochea Moranco (2003), Espey and Owosu-Edusei (2001), Bolitzer and Netusil (2000), Lutzenhiser and Netusil (2001), Geoghegan et al. (2003), Geoghegan (2002), Acharya and Bennett (2001), Irwin (2002), Tajima (2003), Luttik (2000), Loomis et al. (2004) and Breffle et al. (1998). McConnell and Walls (2005) provide a good overview of both property values and non-use values associated with open spaces. All of these studies provide empirical evidence of the potential losses to western citizens from the conversion of open space to industrial use.

Recommendations: The Solar PEIS should include an examination of the impacts of solar energy development on residential and other property values. The agencies should make a quantitative assessment of these potential impacts.

E. Scope of NEPA analysis

NEPA requires the agencies to take a "hard look" at the potential environmental consequences of this proposed action, so that they must assess impacts and effects that include: "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." 40 C.F.R. § 1508.8.

1. Analysis of environmental impacts should be conducted at the landscape level.

The scope of NEPA analysis must be appropriate to the scope of the proposed action. Kern v. United States Bureau of Land Management, 284 F.3d 1062, 1072 (9th Cir. 2002). **In the context of this PEIS, the agencies should look to the overall effect on the landscape of these six connected Western States, and the many resources it contains**. A landscape level analysis of proposed energy corridors will take into account the distribution of resources across the affected

states, complying with the agencies' legal obligations to truly assess potential impacts and yielding management decisions that will balance and protect the multiple resources of these public lands. The placement of and conditions placed on energy corridors can define which areas will remain or become roadless, and which areas will be disturbed and how. By affecting the fragmentation of the landscape, energy corridors can affect how naturally or unnaturally a landscape will behave in terms of water flow and quality, wildlife migration, and species composition and function. In considering the potential impacts of permitting an entire network of energy corridors, the agencies must consider how this placement will change the landscape and interfere with species' ability to migrate and survive.

The correct scope of analysis necessitates consideration of the connected landscapes of these states. For instance, as documented in the *Heart of the West Conservation Plan* (available at: http://wildutahproject.org/files/HOW_Executive_Summary.pdf) -- a science-based spatial analysis of the relative importance of various wildlife habitat cores and linkages throughout the Heart of the West ecoregion -- the areas of northeastern Utah, northwestern Colorado, and southwestern Wyoming are inextricably linked in an ecoregion with core habitat areas and key migratory linkages. As a result, impacts to wildlife habitat in one part of the Heart of the West ecoregion will affect wildlife viability throughout the ecoregion. Similarly, there are basin-wide impacts, in terms of changes to the water quantity and quality in the Green River system, and cumulative impacts to the common airshed, all of which affect the entire Heart of the West ecoregion. Other ecoregions in the planning area addressed by this PEIS are similarly interconnected. *See, e.g.,* the Wildlands Network - http://www.twp.org/cms/page1158.cfm .

A landscape approach is supported by NEPA guidance on cumulative impacts, which requires that the entire area potentially affected be included in a cumulative analysis and holds that a failure to include an analysis of actions within a larger region will render NEPA analysis insufficient. *See, e.g.*, Kern v. U.S. Bureau of Land Management, 284 F.3d 1062, 1078 (9th Cir. 2002) (analysis of root fungus on cedar timber sales was necessary for entire area).
Thus, in order to accurately evaluate the potential environmental consequences of west-wide designation of energy corridors, the cumulative impact analysis would necessarily look at the cumulative impacts on all of the directly and indirectly affected landscapes. The Environmental Protection Agency, in providing direction to its reviewers, emphasizes the importance of ensuring that the cumulative impact analysis is based on "geographic and time boundaries large enough to include all potentially significant effects on the resources of concern. The NEPA document should delineate appropriate geographic areas including natural ecological boundaries, whenever possible, and should evaluate the time period of the project's effects." U.S. Environmental Protection Agency, 1999, *Consideration Of Cumulative Impacts In EPA Review of NEPA Documents*. (emphasis original).

The Council for Environmental Quality's (CEQ) guidelines on cumulative effects analysis provide the following steps for determining the appropriate geographic boundary of cumulative impact analysis:

1. Determine the geographic area that will potentially be directly affected by an action – known as the "project impact zone";
2. Identify resources in the project impact zone that could be affected by the action;

3. Determine the geographic areas occupied by the resources outside the project impact zone.
4. Identify the appropriate area for analysis of cumulative effects based on the largest of the areas determined in step 3. Council on Environmental Quality, 1997, *Considering Cumulative Effects Under the National Environmental Policy Act.*

For the energy corridors, the geographic area of impact will include the resources, such as wildlife, within areas of proposed development and their habitat extending outside such areas. The agencies can and should take the overall impacts of the corridors on the affected landscapes into account when considering their potential environmental consequences. *See, e.g.*, Newmont Mining Corp., 151 IBLA 190 (1999) (Where the Bureau of Land Management could take into account the overall degradation from existing and connected proposed operations, a cumulative analysis of all impacts was required); Kern v. United States Bureau of Land Management, *supra.* (BLM must perform cumulative impact analysis of reasonably foreseeable future timber sales on spread of root fungus before approving single proposed sale). A landscape level analysis is an important part of a programmatic EIS, even if site-specific analysis might be deferred until authorization of specific projects. For instance, the U.S. Court of Appeals for the Ninth Circuit has held that analyzing the overall environmental risks involved in transporting oil from off-shore leases was appropriate and necessary in a PEIS, although specific analysis of individual pipeline locations could be deferred. County of Suffolk v. Secretary of Interior, 562 F.2d 1368, 1376-1377 (2nd Cir. 1977) (It was "essential to consider and weigh the environmental aspects of transportation, as well as of exploration and production."). In order to fulfill the mandate of NEPA that the agencies make an informed assessment of the environmental consequences of its actions, the landscape level effects of an expanded large-scale corridor system must be assessed.

2. Cumulative impact analysis should include other pending programmatic efforts and additional development to be supported by new corridors.

As noted above, NEPA requires the agencies to consider the cumulative impacts of the proposed corridors. The CEQ's NEPA regulations define "cumulative impact" as:

> the impact on the environment which results from the **incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions**. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7. (emphasis added).

The analysis of impacts included in the PEIS must address the cumulative impacts of both the development of utility-scale solar energy projects and other foreseeable connected activities within the same general areas. The resources that allow an ecosystem to function often share a common geography, such that changes to the water quantity and quality in a river system or impacts to an airshed (which may be affected by activities such as oil and gas drilling), all contribute in common. Similarly, changes to these resources may affect the core habitat and linkages that are critical for survival of wildlife and vegetation in a region. Accordingly, where

there are shared environmental resources that can act as indicators of the health of ecosystems, the agencies must analyze all of the direct and indirect impacts that affect them.

The Environmental Protection Agency provides the following guidance to its reviewers on assessing the range of other activities to be considered in cumulative impacts analysis:

1. the proximity of the projects to each other either geographically or temporally;
2. the probability of actions affecting the same environmental system, especially systems that are susceptible to development pressures;
3. the likelihood that the project will lead to a wide range of effects or lead to a number of associated projects; and
4. whether the effects of other projects are similar to those of the project under review.
5. the likelihood that the project will occur -- final approval is the best indicator but long range planning of government agencies and private organizations and trends information should also be used;
6. temporal aspects, such as the project being imminent. U.S. Environmental Protection Agency, 1999, *Consideration Of Cumulative Impacts In EPA Review of NEPA Documents.*

In this case, the BLM's obligation to analyze impacts must encompass not only the proposed and projected solar energy projects, but also the cumulative impacts of the projects, taken together with the impacts of existing, proposed, or reasonably foreseeable projects, on the environment. Thus, the BLM must analyze the cumulative impacts not just of the solar development projects, but also of other projects that will impact resources in common with this proposed action. As discussed above, there are other initiatives to support development and transmission of renewable energy projects and it is critical that the BLM coordinate with these processes and consider the cumulative impacts, which presumably can be reduced by proactive coordination, as well.

In determining the appropriate scope of environmental analysis for an action, the Government must consider not only the single proposed action, but also three types of related actions:

(1) Connected actions - Actions which are closely related and:

(i) Automatically trigger other actions which may require environmental impact statements.

(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; or

(iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

(2) Cumulative actions – Actions, which when viewed with other proposed actions, have cumulatively significant impacts.

(3) Similar actions – Actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental

consequences together, such as common timing or geography. 40 C.F.R. § 1508.25. Under any of these classifications, the coordinated actions that the agencies are taking though this PEIS trigger a broader assessment of the cumulative impacts.

The increased level of solar energy development projects that will follow the completion of this PEIS are also connected to new transmission projects that are likely to trigger preparation of an EIS. Impacts from transmission projects include direct affects to lands, wildlife and natural resources from the construction, ongoing maintenance and monitoring of transmission infrastructures and rights-of-way (ROW). These impacts include direct impacts to soils and vegetation due to clearing ROW, as well as direct wildlife impacts in terms of avian collisions and electrocutions. Indirect impacts include wildlife displacement, increased raptor prey opportunities on vertical structures and habitat fragmentation impacts on a variety of wildlife species. Additional transmission/ROW impacts to consider include noise, EMF, visual and aesthetic concerns.

In addition, the clustering of solar energy development projects with projects to develop more traditional forms of energy in order to access the new transmission corridors proposed in the West-wide Energy Corridor PEIS are likely to have a cumulatively significant effect on the resources in the area. And, since the energy corridors and new transmission will be tied, at least to some extent, on the location of developable energy sources, including solar, these projects are certainly similar in terms of geography. Both the various programs and the increased development projects will have a connected and cumulative effect on resources ranging from elk and pronghorn herds to bird of prey populations, sage grouse populations, air quality, water quality (and erosion and sedimentation), and overall potential for primitive recreation. Therefore, their combined impact should be taken into account as part of the analysis of cumulative impacts associated with this PEIS.

With the western U.S. already possessing over 100,000 linear miles of power lines, the Solar PEIS should analyze opportunities to maximize current grid assets to transport newly developed solar energy instead of new power lines in new ROW. In addition, the PEIS should analyze opportunities at the major population centers to reduce generation import (and therefore transmission) needs by maximizing efficiency, distributed generation resources and other demand-reducing efforts.

3. Site- and use-specific analysis must be conducted prior to designation and approval of energy corridors.

As noted above, the scope of NEPA analysis must be appropriate to the scope of the proposed action. Kern v. United States Bureau of Land Management, 284 F.3d at 1072. In the context of this PEIS, the future approval of individual solar development projects must be based on specific analysis of the proposed locations and uses of the corridors. If the PEIS will not seek to approve individual projects or take the place of site-specific analysis, then the scope of NEPA analysis can be focused more on the general types of impacts and the overall effect of this policy initiative, as is most common for a programmatic EIS. *See*, Northcoast Envt'l v. Glickman, 136 F.3d 660, 688 (9th Cir. 1998) (Programmatic EIS is used to examine "an entire policy initiative."). However, if the PEIS will commit the BLM to a specific course of action, such as

authorizing actual projects, then a site-specific and use-specific analysis of each corridor must be completed. *See*, State of California v. Block, 690 F.2d 753, 765 (9th Cir. 1982); County of Suffolk v. Secretary of Interior, 562 F.2d at 1378.

We recommend that the PEIS include definitive commitments to conduct site-specific NEPA analyses when individual project locations and specifications are identified. In fact, BLM's resource management plans and project-level EISs often state that site-specific analysis is not possible until a particular activity, such as a pipeline, is proposed. This approach would also be consistent with the NEPA regulation governing tiering environmental analysis for a site-specific action to a broader programmatic EIS. The regulation envisions that agencies can tier to a "broad environmental impact statement" so that the subsequent environmental document "shall concentrate on the issues specific to the subsequent action." 40 C.F.R. § 1502.20. In the context of the PEIS, this broader programmatic document should analyze the general effects of an increased level of development of utility-scale solar development. However, tiering to this type of analysis cannot support the approval of projects, which would require a NEPA analysis of the environmental consequences, as "specific to the subsequent action," be included in the PEIS.

4. Range of alternatives

The range of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c).

> NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme.

Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989) (citations and emphasis omitted).

An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. City of Tenakee Springs v. Clough, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally protective alternatives and mitigation measures. *See, e.g.*, Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094,1122-1123 (9th Cir. 2002) (and cases cited therein); *see also* Envt'l Defense Fund., Inc. v. U.S. Army Corps. of Eng'rs, 492 F.2d 1123, 1135 (5th Cir. 1974); City of New York v. Dept. of Transp., 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA's requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming "a foreordained formality."); Utahns for Better Transportation v. U.S. Dept. of Transp., 305 F.3d 1152 (10th Cir. 2002), modified in part on other grounds, 319 F3d 1207 (2003); Or. Envtl. Council v. Kunzman, 614 F.Supp. 657, 659-660 (D. Or. 1985) (stating that the alternatives that must be considered under NEPA are those that would "avoid or minimize" adverse environmental effects).

The current range of alternatives does not contain a sufficient range of alternatives that avoid or minimize environmental effects. Both the "no action" alternative and the "limited development" alternative are ways to proceed with considering solar application on a case-by-case basis. The "facilitated development" alternative (the proposed action) provide for the BLM to develop a solar energy program. There is no consideration of alternatives that would ensure more environmentally responsible approaches to solar energy development. In order to comply with the requirements of NEPA, the PEIS should include additional alternatives that consider:

- A facilitated program with exclusions for all lands with wilderness characteristics, critical habitat and migration corridors in addition to those exclusion areas identified in the Notice of Availability;
- A facilitated program that would be limited by disturbance of only a specific percentage of lands with solar potential at any given time – both for the entire planning area and for the individual field offices affected – to ensure that ecological functions are preserved. Additional disturbance would only be permitted once affected lands with existing disturbance had been restored;
- A facilitated program that prioritizes projects that can show that they will have a net benefit in impacting climate change; and/or
- A facilitated program that would only permit construction of solar projects in close proximity (i.e., within 5 miles) to existing transmission lines or within zones being designated through the RETI or WREZ processes.

Recommendations: NEPA analysis in the PEIS should be conducted at the landscape level, address cumulative impacts, set out standards for additional site-specific analysis for proposed projects, and include more environmentally protective alternatives.

F. Transmission

The Notice of Intent states: "The PEIS will consider whether designation by BLM of additional electricity transmission corridors on BLM-administered lands is necessary to facilitate utility-scale solar energy development." As discussed in detail above, the designation of new corridors should be considered in relation to not only existing transmission lines and the corridors currently being planned by the West-wide Energy Corridors PEIS, RETI, and WREZ processes, as well as others. If the BLM is going to designate new corridors in the PEIS, then BLM must complete all of the necessary NEPA analysis for those corridors, including a thorough discussion as to why the ongoing corridor designation processes will not be sufficient. In making a determination about the need for additional corridors, the BLM should commit to first coordinating with the ongoing designation processes and prioritize using those corridors, instead of designating still more corridors without coordination.

Recommendations: The PEIS must clearly address whether it is merely determining the potential need for new corridors to facilitate new solar energy projects or if the PEIS will also be designating corridors based on projected development. We would recommend that the PEIS focus on using existing and planned corridors, and coordinate with ongoing designation processes to ensure that corridors to support project solar energy development are being designated, instead of designating new corridors.

V. Department of Energy Solar Energy Program

Like the BLM, the DOE must adequately assess all impacts, market and non-market, associated with the development of the agency's solar energy program.

A. Current DOE Solar Energy Program

DOE should disclose the types of solar projects that it currently funds, as well as the specific environmental concerns that are currently addressed by the DOE Solar Energy Technologies Program. This will foster public understanding and participation in the PEIS process. DOE should also establish which program offices, in addition to the Solar Energy Technologies Program, will potentially utilize the PEIS in decision-making.

B. Issues to be Addressed in PEIS

The DOE should incorporate the planning criteria and significant issues identified by the BLM and also those listed in Section IV above for analysis in developing principles for awarding funding for solar energy projects. The scope of DOE's analysis and categories of lands and resources should be broader, however, since the agency's programs can fund projects sited on federal, state, private and tribal lands. For the same reason, socioeconomic impacts are of particular concern. As discussed within the socioeconomic section above, there may be various benefits (social, ecological, and economic) to placing a solar project on private lands or even state or tribal lands, which should be identified in an analysis of potential projects to be funded.

DOE should commit to only supporting solar projects that fully meet the criteria recommended in these comments. Environmentally protective stipulations should be included in all DOE grants; failure to comply with these criteria at any stage in the project should result in loss of funding. The Draft PEIS should include specific mitigation measures and best management practices that the agency, industry, and stakeholders will be expected to adhere to. It's essential that the public has the opportunity to review and comment on these practices during the PEIS process.

C. Range of Alternatives

The DOE should provide a broader range of alternatives than BLM because the agency can fund projects on tribal, state, private, and other federal lands in addition to BLM-administered lands and has no affirmative obligation to process ROWs. These alternatives can include prioritizing projects that have economic benefits, prioritizing projects that are the least environmentally destructive, and prioritizing projects on already degraded lands such as Brownfield or Superfund sites. The Draft PEIS should establish a range of alternatives for the agency to analyze and the public to comment on.

Recommendations: DOE should use this opportunity to mirror the process and analysis being conducted by the BLM, so it can develop a comprehensive set of principles for funding solar projects.

Thank you for considering these scoping comments and for your collective commitment to supporting renewable energy. Please include all of the undersigned in your list of interested persons for this PEIS.

We look forward to continuing to participate in this process. Please feel free to contact us if you have any questions or need additional information. We would also welcome the opportunity to meet with you to present and discuss these comments in person.

Sincerely,

Nada Culver
Senior Counsel, Public Lands Campaign
BLM Action Center
(303) 650-5818 Ext. 117
Nada_culver@tws.org

AND ON BEHALF OF:

Great Old Broads for Wilderness
Veronica Egan, Executive Director
649 E. College Drive
PO Box 2924
Durango, CO 81302

Californians for Western Wilderness
Michael J. Painter, Coordinator
PO Box 210474
San Francisco, CA 94121-0474

Grand Canyon Trust
Roger Clark, Air & Energy Director
2601 N. Fort Valley Road
Flagstaff, AZ 86001

Soda Mountain Wilderness Council
Dave Willis
P.O. Box 512
Ashland, OR 97520

California Wilderness Coalition
Monica Argandoña, Desert Program Director
167 North Third Avenue, Suite M

Upland, CA 91786

Western Environmental Law Center
Monique DiGiorgio, Conservation Strategist
679 East Second Avenue, Suite 11B
Durango, CO 81301

San Luis Valley Ecosystem Council
Christine Canaly
PO Box 223
Alamosa, CO 81101

Wyoming Outdoor Council
Bruce Pendery, Staff Attorney & Program Director
444 East 800 North
Logan, UT 84321

Southern Utah Wilderness Alliance
Heidi McIntosh, Conservation Director
425 East 100 South
Salt Lake City, UT 84111

Sierra Club
Bill Corcoran, Senior Regional Representative
3435 Wilshire Blvd., Suite 660
Los Angeles, CA 90010

Natural Resources Defense Council
Johanna H. Wald, Senior Attorney
111 Sutter Street
San Francisco, CA 94104

Red Rocks Forests
Terry Shepherd, Executive Director
90 West Center Street
Moab, UT 84532

Center for Water Advocacy
& Local Green Party of Moab
Harold Shepherd, Executive Director
PO Box 331
Moab, UT 84532

San Luis Valley Water Protection Coalition
Ceal Smith

PO Box 351
Alamosa, CO 81101

Western Resource Advocates
Tom Darin, Energy Transmission Attorney
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Defenders of Wildlife
Peter Nelson, Director, Federal Lands Program
1130 17th Street NW
Washington DC 20036-4604

Arizona Wilderness Coalition
Kevin Gaither-Banchoff, Executive Director
P.O. Box 40340
Tucson, AZ 85717

Colorado Environmental Coalition
Elise Jones, Executive Director
1536 Wynkoop Street #5C
Denver, CO 80202

Friends of the Missouri Breaks Monument
Dennis Tighe, President
717 13th Street SW
Great Falls, MT 59401

Nevada Wilderness Project
John Tull
8550 White Fir Street
Reno, NV 89523

Attachments

1. Letter from William H. Meadows, President of The Wilderness Society, to the House Appropriations Committee, July 8, 2008.
2. Haefele, M., P. Morton, and N. Culver. 2007. *Natural Dividends: Wildland Protection and the Changing Economy of the Rocky Mountain West.* Washington DC: The Wilderness Society.
3. Motion to Stay Briefing and for a Status Conference, September 9, 2005.
4. Southern Utah Wilderness Alliance v. Norton, 457 F. Supp. 2d 1253 (D. Utah 2006).
5. *Citizen-Wilderness Proposals,* CD of GIS Data.

6. The Wilderness Society. 2006. *Socio-Economic Framework for Public Land Management Planning: Indicators for the West's Economy.* Washington DC: The Wilderness Society.
7. *Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle?,* Science, Vol. 320, pp. 1094-140 (June 13, 2008).

Appendix 1

a. *Habitat Fragmentation from Roads: Travel Planning Methods to Safeguard BLM Lands*
b. *Fragmenting Our Lands: The Ecological Footprint from Oil and Gas Development*
c. *Protecting Northern Arizona's National Monuments: The Challenge of Transportation Management*
d. *Wildlife at a Crossroads: Energy Development in Western Wyoming*
e. *Ecological Effects of a Transportation Network on Wildlife*

References

Acharya, G. and L. L. Bennett. 2001. Valuing open space and land-use patterns in urban watersheds. *Journal of Real Estate Finance and Economics* 22(2-3): 221-237

American Solar Energy Society. 2008. Concentrated Solar Power, Solar Electric Division. (www.ases.org/divisions/electric/facts_csp.pdf, accessed July 8, 2008)

Barrens, R., J. Talberth, J. Thacher, M. Hand. 2006. Economic and Community Benefits of Protecting New Mexico's Inventoried Roadless Areas. Center for Sustainable Economy, Santa Fe, NM. Available at: http://www.sustainable-economy.org/uploads/File/Final%20Report.pdf *(*accessed February 22, 2007*)*

Bennett, K., and M.K. McBeth. 1998. Contemporary western rural USA economic composition: Potential implications for environmental policy and research. Environmental Management 22(3): 371-381.fs

Bengochea Moranco, A. 2003. A hedonic valuation of urban green areas. Landscape and Urban Planning 66(1): 35-41.

Bishop, R. C. and M. P. Welsh. 1992. Existence Values in Benefit-Cost Analysis and Damage Assessment. *Land Economics* 68(4): 405-417.

Bolitzer, B. and N.R. Netusil. 2000. The impact of open spaces on property values in Portland, Oregon. Journal of Environmental Management 59(3): 185-193.

Bowker, J. M., J. E. Harvard III, J. C. Bergstrom, H. K. Cordell, D. B. K. English, and J. B. Loomis. 2005. The net economic value of wilderness. In: Cordell, H. K., J. C. Bergstrom, and J.M. Bowker (eds), *The Multiple Values of Wilderness*. State College, PA: Venture Publishing.

Breffle, W. S., E. R. Morey and T. S. Lodder. 1998. Using contingent valuation to estimate a neighbourhood's willingness to pay to preserve undeveloped urban land. *Urban Studies* 35(4): 715-727.

California Energy Commission. July1, 2008. Ivanpah Solar Electric Generating System. (http://www.energy.ca.gov/sitingcases/ivanpah/index.html, accessed July 9, 2008)

Center for the Study of Rural America. 2006a. Regional Asset Indicators: Human Amenities. May 16, 2006. http://www.kansascityfed.org/RegionalAffairs/Indicators/Humanamenities_506.pdf

Center for the Study of Rural America. 2006b. Regional Asset Indicators: The Creative Workforce. July 2006. http://www.kansascityfed.org/RegionalAffairs/Indicators/Creative%20Workers_706.pdf

Cordell, H.K., M.A. Tarrant, B.L. McDonald and J. C. Bergrstrom. 1998. How the public views wilderness: More results form the USA survey on recreation and the environment. *International Journal of Wilderness* 4(3): 28-31.

Cure for the Common Coal: Can Wind Power Replace Traditional Fossil Power? Time2Time.June 3, 2008. http://uva72.blogspot.com/2008/06/cure-for-common-coal-can-wind-power.html

Deller, S.C. 1995. Economic Impacts of Retirement Migration. Economic Development Quarterly 9(1): 25-38.

Deller, S.C., T. Tsai, D.W. Marcouiller, and D.B.K. English. 2001. The Role of Amenities and Quality of Life in Rural Economic Growth. American Journal of Agricultural Economics 83(2): 352-365.

Duffy-Deno, K. T. 1998. The Effect of Federal Wilderness on County Growth in the Intermountain Western United States. Journal of Regional Science 38(1): 109-136.

Earnhart, D. 2006. Using contingent-pricing analysis to value open space and its duration at residential locations. *Land Economics* 82(1):17-35.

Earth Policy Institute. 2008. Data for U.S. Moving Toward Ban on New Coal-Fired Power Plants.(http://www.earth-policy.org/Updates/2008/Update70_data.htm, accessed July 9, 2008)

Espey, M. and K. Owosu-Edusei. 2001. Neighborhood parks and residential property values in Greenville, South Carolina. *Journal of Agricultural and Applied Economics* 33(3): 487-492.

Energy Justice Network. 2007. "Fact Sheet: 'Clean Coal' Power Plants (IGCC)." (http://www.energyjustice.net/coal/igcc/factsheet-long.pdf, accessed July 9, 2008)

European Commission. 2007. "Concentrating Solar Power: From Research to Implementation." (http://ec.europa.eu/energy/res/publications/doc/2007_concertrating_solar_power_en.pdf, accessed July 9, 2008).

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (German) 2003. Concentrating Solar Power Now – Clean Energy for Sustainable

Development.(http://www.escocyprus.com/epa/Specifications/CSP1.pdf, accessed July 9, 2008)

Forman, R.T. 1999. Estimate of the area affected ecologically by the road system in the United States. *Conservation Biology* 14: 31-35.

Freeman, A.M. III, 2003, *The Measurement of Environmental and Resource Values*, 2nd Edition, Resources for the Future, Washington, D.C.

FutureGen Industrial Alliance, Inc.2007. Final Site Selection Report, Submitted to the U.S. Department of Energy, Dec. 18, 2007.

FutureGen Alliance, Inc. 2006. Frequently Asked Questions. (http://www.futuregenalliance.org/faqs.stm, accessed July 9, 2008)

Geoghegan, J. 2002. The value of open space in residential land use. *Land Use Policy* 19(1): 91-98

Geoghegan, J., L. Lynch, and S. Bucholtz. 2003. Capitalization of open spaces into housing values and residential property tax revenue impacts of agricultural easement programs. *Agricultural and Resource Economics Review* 32(1): 35-45.

Gowdy, J. M. 1997. The Value of Biodiversity: Markets, Society, and Ecosystems. *Land Economics* 73(1): 25-4`.

Haefele, M., P. Morton, and N. Culver. 2007. *Natural Dividends: Wildland Protection and the Changing Economy of the Rocky Mountain West*. Washington, D.C.: The Wilderness Society. (available at: http://www.wilderness.org/Library/Documents/NaturalDividends.cfm).

Haynes, R. W.; Horne, A.L. 1997. Economic Assessment of the Basin. In T.M. Quigley and S.J. Arbelbide (eds.), An assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins: Volume IV. 1715-1870. USDA Forest Service, PNW-GTR-405, Pacific Northwest Research Station, Portland, OR.

Hoekstra, T.W., Alward, G.S., Dyer, A.A., Hof, J.G., Jones, D.B., Joyce, L.A., Kent, B.M., Lee, R., Sheffield, R.C., Williams, R. 1990. Analytical tools and information. Critique of Land Management Planning, Volume 4. USDA Forest Service, FS-455. 47 pp. Available at: http://www.fs.fed.us/institute/planning_center/1990_Critique_First_Planning_Round/critique%20of%20LMP-Vol%204%20ACR5%2090.pdf

Holmes, F.P. and W.E. Hecox. 2004. Does Wilderness Impoverish Rural Regions? International Journal of Wilderness 10(3): 34-39.

Irwin, E.G. 2002. The effects of open space on residential property values. Land Economics 78(4): 465-480.

Johnson, J. and R. Rasker. 1993. The Role of Amenities in Business Attraction and Retention. Montana Policy Review 3(2).

Johnson, J., and R. Rasker. 1995. The Role of Economic and Quality of Life Values in Rural Business Location. Journal of Rural Studies 11(4): 405-416.

Johnson, T.G. 2001. The Rural Economy in a New Century. International Regional Science Review 24(1): 21-37.

Kammen, D.M., K. Kapadia, and M. Fripp. 2004. Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate? RAEL Report,

Krieger, D. J. 2001. Economic Value of Forest Ecosystem Services: A Review. Washington D.C.: The Wilderness Society.

Krikelas, A.C. 1991. Industry structure and regional growth: A vector autoregression forecasting model of the Wisconsin regional economy. Ph.D. Dissertation. University of Wisconsin-Madison.

Krutilla, J. 1967. Conservation reconsidered. American Economic Review. 57: 787-796.

Lehmkuhl, J.F., and L.F. Ruggiero. 1991. Forest fragmentation in the Pacific Northwest and its potential effects on wildlife. Pages 35-46 in Ruggiero, L.F., K.B. Aubry, A.B. Carey, and M.H. Huff, tech. coords. *Wildlife and Vegetation of Unmanaged Douglas-fir Forests*. USDA Forest Service Gen. Tech. Rep. PNW-GTR-285. Portland, OR.

Loomis, J. B. and R. Richardson. 2000. Economic Values of Protecting Roadless Areas in the United States. Washington, D.C.: The Wilderness Society and Heritage Forests Campaign.

Loomis, J. B. and R. Richardson, 2001. Economic values of the U.S. wilderness system: Research evidence to date and questions for the future. International Journal of Wilderness 7(1): 31-34.

Loomis, J., V. Rameker, and A. Seidl. 2004. A hedonic model of public market transactions for open space protection. Journal of Environmental Planning and Management 47(1): 83-96.

Lorah, P. 2000. Population Growth, Economic Security and Cultural Change in Wilderness Counties. In McCool, S.F., D.N. Cole, W.T. Borrie, and J. O'Loughlin, comps. Wilderness Science in a Time of Change Conference, Volume 2: Wilderness within the Context of Larger Systems, 1999 May 23-27. Missoula, MT. Proceedings RMRS-P-15-VOL 2., U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden, UT.

Lorah, P. and R. Southwick. 2003. Environmental Protection, Population Change, and Economic Development in the Rural Western United States. Population and Environment 24(3): 255-272.

Low, S. 2004. Regional Asset Indicators: Entrepreneurship Breadth and Depth. The Main Street Economist, September, 2004. Center for the Study of Rural America, Federal Reserve Bank of Kansas City, Kansas City, MO.

Low, S., J. Henderson, and S. Weiler. 2005. Gauging a Region’s Entrepreneurial Potential. Economic Review (Third Quarter) Federal Reserve Bank of Kansas City.

Luttik, J. 2000. The value of trees, water and open space as reflected by house prices in the Netherlands. Landscape and Urban Planning 49: 161-167

Lutzenhiser, M. and N.R. Netusil. 2001. The effect of open spaces on a home’s sale price. Contemporary Economic Policy 19(3): 291-298.

Mabey, Sarah, Ph.D. and Ellen Paul. 2007. Critical Literature Review, Impact of Wind Energy and Related Human Activities on Grassland and Shrub-Steppe Birds. (available at

http://www.nationalwind.org/pdf/IMPACTOFWINDENERGYANDRELATEDHUMANACTIVITIESONGRASSLANDANDSHRUB-STEPPEBIRDS.pdf, accessed July 14, 2008)

McGranahan, D.A. 1999. Natural Amenities Drive Rural Population Change. U.S. Department of Agriculture, Economic Research Service, Food and Rural Economics Division. Agricultural Economics Report No. 781.

Morton, P. 1999. The economic benefits of wilderness: theory and practice. Denver University Law Review, 76(2): 465-518.

Morton, P. 2000. Wilderness, the Silent Engine of the West's Economy. The Wilderness Society, Washington, DC.

National Association of Regulatory Commissioners, 2007. "Land-Based Initiatives and Climate Change." (Power Point presentation) SRA International. EPA Land Revitalization Staff Office. (http://www.narucmeetings.org/Presentations/NARUC%20Pres%20July%2015.ppt#486,2,Land-Based Opportunities, accessed July 9, 2008) Navigant Consulting, Inc. estimates, June 2006.

Nelson, P.B. 1999. Quality of Life, Nontraditional Income, and Economic Growth: New Development Opportunities for the Rural West. Rural Development Perspectives 14(2): 32-37.

New York Times. October 24, 1998. "A Flurry of Proposals for Gas-Fired Power Plants." By Eleanor Charles (http://query.nytimes.com/gst/fullpage.html?res=9504EFDC173FF936A15753C1A96E958260 accessed July 9, 2008)

Payne, C., J. M. Bowker, and P. C. Reed. (compilers) 1992. The economic value of wilderness: Proceedings of the conference; 1991 May 8-11; Jackson, WY. Gen. Tech. Rep. SE-78. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 330 pp.

Power, T. 1995. Economic Well-Being and Environmental Protection in the Pacific Northwest: A Consensus Report by Pacific Northwest Economists. University of Montana, Missoula, MT.

Power, T. M. 1996. Lost Landscapes and Failed Economies. Island Press, Covelo, CA.

Rasker, R. and D. Glick. 1994. Footloose Entrepreneurs: Pioneers of the New West? Illahee 10(1): 34-43.

Rasker, R. and A. Hansen. 2000. Natural Amenities and Population Growth in the Greater Yellowstone Region. Human Ecology Review 7(2): 30-40

Rasker, R., B. Alexander, J. van den Noort, and R. Carter. 2004. Public Lands Conservation and Economic Well-Being. The Sonoran Institute, Tucson, AZ. Available at: http://www.sonoran.org/programs/prosperity.html.

Reeder, R. J. and D. M. Brown. 2005. Recreation, Tourism and Rural Well-Being. U.S. Department of Agriculture, Economic Research Service. Economic Research Report Number 7. 38 pp.

Richardson, H.W. 1985. Input-Output and Economic Base Multipliers: Looking backward and forward. Journal of Regional Science Vol. 25(4).

Robel, Robert J. et al. 2004. Effect of Energy Development and Human Activity on the Use of Sand Sagebrush Habitat by Lesser Prairie-Chickens in Southwestern Kansas. (available at http://kec.kansas.gov/wptf/robertrobel.pdf, accessed July 14, 2008)

Rudzitis, G. 1999. Amenities Increasingly Draw People to the Rural West. Rural Development Perspectives 14(3): 9-13.

Rudzitis, G., and H.E. Johansen. 1989. Amenities, Migration, and Nonmetropolitan Regional Development. Report to National Science Foundation. Department of Geography, University of Idaho, Moscow, ID.

Rudzitis, G. and R. Johnson. 2000. The Impact of Wilderness and Other Wildlands on Local Economies and Regional Development Trends. In McCool, S.F., D.N. Cole, W.T. Borrie, and J. O'Loughlin, comps. Wilderness Science in a Time of Change Conference, Volume 2: Wilderness within the Context of Larger Systems, 1999 May 23-27. Missoula, MT. Proceedings RMRS-P-15-VOL 2., U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden, UT.

Salt Lake City Weekly. May 3, 2007. "Killer Coal" by Jonah Owen Lamb (http://www.slweekly.com/index.cfm?do=article.details&id=1CA7B2DC-2BF4-55D0-F1FC484A425B4016, accessed July 9, 2008)

Sawyer et al., 2005 Annual Report, Sublette Mule Deer Study (Phase II): Long-term monitoring plan to assess potential impacts of energy development on mule deer in the Pinedale Anticline Project Area, (October 2005) <http://www.west-inc.com/reports/PAPA_2005_report_med.pdf> (visited November 23, 2005).

Sawyer, H., and F. Lindzey. 2004. Assessing Impacts of Oil and Gas Development on Mule Deer. *Transactions from the 69th North American Wildlife and Natural Resources Conference*.

Sawyer, H., and F. Lindzey. 2001. Sublette Mule Deer Study. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. 51pp.

Shumway, J.M. and S.M. Otterstrom. 2001. Spatial Patterns of Migration and Income Change in the Mountain West: the Dominance of Service-Based, Amenity-Rich Counties. Professional Geographer 53(4): 492-501.

Snepenger, D.J., J.D. Johnson, and R. Rasker. 1995. Travel-Stimulated Entrepreneurial Migration. Journal of Travel Research 34(1): 40-44

Sonoran Institute. 2006. “The Potential Economic Impacts of Wilderness in Dona Ana County, New Mexico.”

Stoddard, L., J. Abiecunas, and R. O'Connell.2006. Economic, Energy, and Environmental Benefits of Concentrating Solar Power in California. Golden, CO: National Renewable Energy Laboratory.69 pp. (http://www.nrel.gov/docs/fy06osti/39291.pdf, accessed July 9, 2008)

Tajima, K. 2003. New estimates of the demand for urban green space: implications for valuing the environmental benefits of Boston's Big Dig project. Journal of Urban Affairs 25(5): 641-655.

Tiebout, C.M. 1956. Exports and regional economic growth. Journal of Political Economy 64:160-64.

Thompson, E., G. Hammond, and S. Weiler. 2006. Amenities, Local Conditions, and Fiscal Determinants of Factor Growth in Rural America. RWP 06-08, Research Working Papers, The Federal Reserve Bank of Kansas City, Economic Research Department.

Union of Concerned Scientists. 2005. "Environmental Impacts of Coal Power: Air Pollution." (http://www.ucsusa.org/clean_energy/coalvswind/c02c.html, accessed July 9, 2008).

Union of Concerned Scientists. 2005. "Environmental Impacts of Coal Power: Water Use." (http://www.ucsusa.org/clean_energy/coalvswind/c02b.html accessed July 9, 2008)

United States Congress, Office of Technology Assessment. 1992. Forest Service planning: Accommodating uses, producing outputs, and sustaining ecosystems, OTA-F-505. Washington, DC.

University of California, Berkeley. P. 10.(http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf, accessed July 9, 2008)

U.S. Environmental Protection Agency. 2008."Energy Department Announces National Initiative to Redevelop Brownfields with Renewable Energy." (http://www.epa.gov/brownfields/html-doc/brightfd.htm, accessed July 9, 2008)

U.S. Department of Energy, Energy Efficiency and Renewable Energy. National Renewable Energy Laboratory. 2004 PV FAQ's. (www.hubbertpeak.com/Apollo2/photovoltaics/HowMuchLandNREL.pdf, accessed July 9, 2008)

U.S. Department of Energy, Energy Efficiency and Renewable Energy. National Renewable Energy Laboratory. "Concentrating Solar Power." solareis.anl.gov/documents/docs/NREL_CSP_1.pdf

U.S. Department of the Interior, Office of Surface Mining. 2006. Annual Report Data Tables and Figures.(http://www.osmre.gov/annualreports/06AR11.pdf, accessed July 9, 2008)

Walsh, R. G. J. B. Loomis, and R. A. Gillman 1984. Valuing Option, Existence, and Bequest Demands for Wilderness. Land Economics, *60(1): 14-29.*

Washington Independent Harnessing the Sun: April 11, 2008."The Future of Green Jobs." by Suemedha Sood. (http://washingtonindependent.com/view/harnessing-the-sun, accessed July 9, 2008)

Weiler, S. 2004. Racing Toward New Frontiers: Helping Regions Compete in the Global Marketplace. The Main Street Economist, *March 2004. Center for the Study of Rural America, Federal Reserve Bank of Kansas City, Kansas City, MO.*

Western Governors' Association, Clean and Diversified Energy Initiative. 2006. Solar Task Force Report.

Whitelaw, E., and E.G. Niemi. 1989. Migration, Economic Growth, and the Quality of Life. In Proceedings of the Twenty-Third Annual Pacific Northwest Regional Economic Conference, Corvallis, OR, pp 36-38.

Whitelaw, E., et al. 2003. A Letter from Economists to President Bush and the Governors of Eleven Western States Regarding the Economic Importance of the West's Natural Environment. (100 total authors.) Available at: http://www.ourforests.org/fact/120303letter.pdf (accessed January 17, 2008)

May 22, 2009

Delivered via U.S. mail (including data CD attachment) and electronic mail (without data attachment).

Linda Resseguie
Solar PEIS Project Director
Bureau of Land Management
Mail Stop 1000LS
1849 C Street NW
Washington, DC 20240

Re: Considerations for Solar Energy Study Areas in BLM Solar Energy Development Programmatic Environmental Impact Statement

We are writing in response to news that the Bureau of Land Management (BLM) is considering developing an alternative in the Draft Solar Energy Development Programmatic Environmental Impact Statement (PEIS) which would designate "Solar Energy Study Areas" (Study Areas) and providing information based on our current understanding of this process. Since it informs our recommendations, we are summarizing our understanding of this process below:

- Study Areas will be selected for lands which have high solar potential, proximity to existing transmission and other infrastructure, and limited environmental and other land use conflicts;
- The PEIS will complete detailed analysis of potential impacts from solar development in these Study Areas, allowing future projects within Study Areas to benefit from environmental analysis tiered to the PEIS;
- BLM has already begun the process of identifying Study Areas, and has mapped candidate Study Areas in each of the six states analyzed in the PEIS.

The Wilderness Society supports the efforts of the agencies to develop a PEIS to address the many benefits and challenges of solar energy development on public lands. A thoughtful approach to renewable resource development, including transmission, is vital.

Identifying the best places for solar energy development is an important first step in ensuring that the transition to a clean energy future does not come at the expense of our lands, water, wildlife, and communities. For this reason, we support the BLM's consideration of designating "least conflict" areas as priority Study Areas for development; however, the manner in which Study Areas are selected will ultimately determine whether this is a successful approach.

Thorough consideration of input from the broad array of stakeholders in this process will be crucial in a successful Study Areas designation process. The Wilderness Society and our conservation partners have much to offer in this regard, and hope to be as helpful as possible to the BLM in refining the Study Areas. As of now, the BLM has not provided maps or GIS data depicting the candidate Study Areas, nor has the agency provided detailed information on the criteria used to identify the Study Areas. Without this information, providing detailed input and review will be challenging. To make our participation as useful as possible, we urge the BLM to provide for review maps and GIS data of the Study Areas as well as detailed information on the identification criteria used.

Whether or not additional data is provided, The Wilderness Society still intends to provide input on appropriate criteria for designating Study Areas, and has begun the process of coordinating with conservation partners. As a threshold matter, however, we are providing the GIS data for Citizens' Proposed Wilderness areas (Appendix A, attached), so that the BLM can screen candidate Study Areas for conflict and remove any overlap. These data were submitted with our scoping comments last summer and are already part of the record, but we are providing them again for your convenience.

These Citizens' Proposed Wilderness areas have been inventoried by various citizens groups, conservationists, and agencies and found to have "wilderness characteristics," including naturalness, solitude and the opportunity for primitive recreation. These lands also provide important wildlife habitat, cultural and scientific resources, invaluable ecosystem services including clean air and water, important economic benefits, and many other resources and values. Though they do not represent all lands with wilderness characteristics in the West, the lands referenced in this letter and Appendix A (attached) are the most current representation of lands identified by the responsible groups to-date. Development in Citizens' Proposed Wilderness areas would be ecologically irresponsible and would lead to high levels of conflict; they should be excluded from Study Areas.

In sum, The Wilderness Society supports the BLM's efforts to identify priority "least conflict" Study Areas for development in the PEIS, and we will be working with our conservation partners to provide detailed input on designation of Study Areas.

To ensure the Study Areas are as useful as possible in promoting responsible, sustainable solar energy development, we recommend that the BLM:

- Provide maps and GIS data of the candidate Study Areas, as well as detailed information on the criteria used to identify them;
- Provide an opportunity for public comment on the proposed Study Areas;
- Screen the candidate Study Areas for conflict with Citizens' Proposed Wilderness areas and remove any overlap;
- Fully consider additional forthcoming detailed input from The Wilderness Society and conservation partners.

Thank you for your consideration of our recommendations. We would be happy to discuss these further at your convenience or upon submission of our additional materials.

Sincerely,

Alex Daue, Renewable Energy Coordinator
BLM Action Center
The Wilderness Society
1660 Wynkoop, Suite 850
Denver, CO 80202

Cc:
Eddie Arreola, Arizona State BLM Solar Energy Development PEIS Lead
Ashley Conrad-Saydah, California State BLM Solar Energy Development PEIS Lead
Maryanne Kurtinaitis, Colorado State BLM Solar Energy Development PEIS Lead
Patrick Gubbins, Nevada State BLM Branch Chief for Non-Renewable Resources
Brian Amme, Nevada State BLM Planning and Environmental Coordinator
Cynthia Sandoval, New Mexico State BLM Solar Energy Development PEIS Lead
Mike DeKeyrel, Utah State BLM Solar Energy Development PEIS Lead

SONORAN INSTITUTE
Shaping the Future of the West
www.sonoraninstitute.org

TUCSON, ARIZONA
BOZEMAN, MONTANA
PHOENIX, ARIZONA
MEXICALI, BAJA CALIFORNIA
HELENA, MONTANA
CHEYENNE, WYOMING
DENVER, COLORADO
GLENWOOD SPRINGS, COLORADO

August 13, 2009

Teri Raml
Phoenix District Office Manager
BLM Arizona State Office
One North Central Avenue, Suite 800
Phoenix, AZ 85004-4427

Re. Restoration Design Energy Project, Call for Projects

Dear Ms. Raml:

The Sonoran Institute, The Wilderness Society, Sierra Club, Arizona Wilderness Coalition, and Tonopah Area Coalition are pleased that the Bureau of Land Management (BLM) is providing an additional opportunity to consider siting of renewable energy projects on BLM lands through its National System of Public Lands Restoration Design Energy Project.

In response to the BLM's request for project proposals, we looked at three parcels of land identified by the BLM as candidates for land disposal in the Agua Fria National Monument and Brandshaw-Harquahala and the Sonoran Desert National Monument-Phoenix South resource management plans which may be worthwhile candidates for solar energy projects. We selected these parcels because they met the BLM's Solar Study Area criteria for solar resource, slope, parcel size, and proximity to existing utility corridors. Also, because of the BLM criteria for identifying parcels for disposal, such parcels also meet the Restoration Design Energy Project's criteria for parcels that "do not have higher resource values and may be suitable for energy development."

We conducted rapid site assessments for these parcels (site assessment for each site are included as an attachment). These assessments identified a number of issues that will require further investigation by the BLM should the agency decide that these site merit consideration as project sites. Rather than get into a detailed discussion of the individual sites, we would like to highlight issues that we believe will likely cut across these sites and other project proposals that the BLM may assess (highlighting these issues may contribute toward the development of criteria that the BLM can use in the selection of proposed projects to evaluate):

- Locating near other approved or proposed solar projects – There are a number of solar projects likely to be sited on private and state trust lands that are near BLM lands. There is value in having the BLM assess proposed projects near these sites, both for the cumulative impact analysis that would result and also because it may encourage

the location of sites in close proximity to each other, thereby reducing the cost and environmental impacts associated with dispersed siting and transmission and other infrastructure development.

- Aligning with other planning efforts – Proposed solar projects may conflict with local land-use plans, as well as regional transportation and utility corridor planning. Consultation with local government and state agencies is critical.

- Engaging Neighboring Developers – To the extent that proposed projects are adjacent or close to land that has been platted for development, there may be opportunities to explore with landowners their interest in promoting solar power on BLM lands for their development projects.

- Engaging Federal Facilities – Same point as above. The BLM may be able to provide land for siting and the federal agency housed at the facility secures funding for the solar power project from the Federal Energy Management Program.

- Engaging Other Landowners – We note that landfills, CAP canal, correctional facilities, communication sites, private businesses and other facilities may be interested in siting smaller-scale power generating opportunities on neighboring BLM lands.

- Siting Near Adjacent Power Plants – Locating near existing power plants may offer opportunities to take advantage of existing infrastructure and water resources, such as treated effluent to cool solar plants.

- Encouraging Low-water Use Project – We note that water use by solar projects is likely to emerge as a serious concern for any proposed project in Arizona. We would encourage the BLM to establish some additional criteria for proposed projects that encourage low- or no-water use proposals.

We thank you for the opportunity to share our thoughts on this promising initiative. We would be happy to discuss the disposal sites we assessed, as well as any other candidate project sites you are considering.

John Shepard
Senior Adviser
Sonoran Institute

Rebecca Knuffke
Central Arizona Campaigns Coordinator
The Wilderness Society

Sandy Bahr
Chapter Director
Sierra Club

Kevin Gaither-Banchoff
Executive Director
Arizona Wilderness Coalition

David Schwake
Tonopah Area Coalition

Protocol Among the Members of the Western Governors Association, The U.S. Department of the Interior, The U.S. Department of Agriculture, The U.S. Department of Energy, and The Council on Environmental Quality Governing the Siting and Permitting of Interstate Electric Transmission Lines in the Western United States

A. BACKGROUND

1. Open transmission access has accelerated the regionalization of electric power markets in the West. Existing electric transmission systems that were generally designed to move power within local utility systems, bring power from generation sites to regulated utility customers, and interconnect neighboring utilities to improve reliability with some coordination transactions are now increasingly being used to enable power sales across large geographic areas.

2. The transmission system in the continental United States is organized into three separate electric interconnections. The Western Interconnection, which covers all or parts of 14 Western states, two Canadian provinces and northwest Mexico, has a different transmission topology than the other interconnections because of highly variable seasonal demand within the interconnection and the long distances between where the power is generated and where it is consumed. In the West, power sales have taken place across large geographic areas and between regions for decades.

3. Generally, authority to site transmission lines and grant the power of eminent domain for the construction of new transmission facilities has been exercised by the states.

4. Although Western states have a sterling record in permitting interstate transmission lines, expanding regional wholesale electricity markets and the preponderance of federally-administered lands in the West necessitate closer cooperation among states, local governments, federal agencies and tribal governments to ensure an efficient permitting and siting of new interstate transmission facilities.

5. This Protocol is a step in implementing the *Memorandum of Understanding Among the U.S. Department of Energy, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Environmental Protection Agency, Council on Environmental Quality, and the Members of the Western Governors' Association Regarding Energy Development and Conservation in the Western United States*, signed in 2001.

B. POLICY POSITION

1. The purpose of this Protocol is to establish a framework that will enable affected states, local governments, federal agencies and tribal governments to participate in a systematic, coordinated, joint review process for siting and permitting of interstate transmission lines in the Western Interconnection.

2. The Protocol is intended to increase the efficiency of the siting process by including all affected governmental entities with authority for siting and permitting interstate transmission facilities. It is the intent of Western Governors to work with the appropriate local governments, federal land management agencies, and tribal governments and solicit their participation on Project Teams established under this Protocol.

3. The Western Governors believe that a coordinated joint review process involving states, local governments, federal agencies, and tribes can expedite the siting and construction of needed transmission facilities to better ensure adequate, affordable and reliable electricity supply to Western consumers.

4. When linked with a pro-active regional transmission planning and implementation process that considers transmission and non-transmission alternatives and appropriate systems for financing new transmission and alternatives, a coordinated, interstate joint review of proposed interstate transmission facilities will enable identification and consideration of interstate needs, facilitate the construction of needed transmission, and ensure that the public interest is protected.

C. OBJECTIVES IN DEVELOPING A COORDINATED JOINT REVIEW PROCESS

1. Create an efficient environmental review process that results in documents that can be shared and used by all entities with jurisdiction in the siting and permitting process.

2. Establish and periodically review joint time lines for the conduct and timely completion of review and regulatory decision-making.

3. Establish a common understanding of the informational needs, regulatory requirements, and public interest issues prior to the environmental review proceeding.

4. Eliminate duplication of agency pre-application, scoping, and permit review meetings among affected state, local, federal and tribal authorities.

5. Create a transparent streamlined review process that is structured, user friendly and predictable.

6. Facilitate early notification and sharing of information among affected states, local governments, federal agencies, tribal governments and the project sponsors.

7. Preserve and protect authority of each affected state, local government, tribal government, and federal agency.

D. IMPLEMENTATION

1. To implement this process, the parties to this agreement will adopt the following elements as part of the coordinated joint review of specific proposed interstate transmission projects:

   a. Designation of a Project Team – The governors of states affected by a proposed transmission line shall convene a team of appropriate representatives from each state to coordinate the review of a proposed project and to ensure the timely notification, consultation, and joint sharing of information and solicitation of recommendations among states, local jurisdictions, and other affected parties. Representatives of federal agencies (and federal agency teams) and tribal governments with permitting or land management responsibilities shall be invited to join the Project Team. Participation on the Project Team shall in no way diminish the responsibilities or authority of any member.

   b. Determination of Need – The Project Team shall evaluate assessments of the need for the project developed through regional transmission planning processes and other processes and shall provide the assessments and their evaluation, as necessary, to any agency. The Project Team's evaluation shall in no way bind determinations and decisions made by the appropriate state, federal, tribal, and local authorities.

   c. Federal Agencies' Responsibilities – The appropriate federal land management agency(ies) will participate on the Project Team, as necessary, to expedite the siting review process and improve efficiencies of the application process consistent with Executive Order 13212. The Fish and Wildlife Service will commit to consult and cooperate by participating early and, as appropriate and as resources are available, throughout the review process to assist the Project Team members in meeting their Endangered Species Act and Migratory Bird Treaty Act compliance requirements. The Bureau of Land Management, Forest Service and Fish and Wildlife Service will follow the process described in the August 30, 2000, *Memorandum of Agreement – Endangered Species Act Section 7 Programmatic Consultations and Coordination among the Bureau of Land Management, Forest Service, National Marine Fisheries Service and Fish and Wildlife Service.*

d. Decisions, Activities, and Records – The Project Team shall establish procedures to encourage joint activities, records, and decisions regarding planning, evaluating, and monitoring of a proposed transmission line or facility. The specific activities which the Project Teams and other interested parties agree to perform jointly, the manner of execution, including level of detail, methodology, management and staff interaction, dollar value, and such other items as the parties deem necessary and appropriate shall be negotiated and clearly set forth in work plans and/or subsequent agreements covering individual energy projects. Any decision issued by a state, federal or local authority which is appealed or protested is not binding on the decisions that may be issued by other agencies who are members of the Project Team.

e. Consolidated Environmental Review – The activities which the parties hereby agree to undertake jointly may include, but are not limited to: preparation of environmental assessments and environmental impact statements, as appropriate; the evaluation of baseline conditions of the natural, social, and economic environment; evaluation of potential impacts of a project and alternatives; public involvement efforts; monitoring impacts of project construction and operation; and all other activities that are required to determine compliance with federal, state, local, and tribal laws and regulations. The Project Team shall jointly develop procedures for a consolidated environmental review of a proposed project.

f. Timelines –The Project Team shall establish and periodically review common, mutually agreeable deadlines for activities, reviews, and decisions. The Project Team will identify where joint decisions are to be made, and by whom. Timelines will include and account for the time that may be needed to address and dispose of disputes or administrative appeals of decisions made by all jurisdictional authorities, should such disputes or appeals of decisions be filed.

g. Information Requests – The Project Team shall serve as a clearinghouse for agency requests for information from developers of the proposed project and provide information to the developer about necessary permits, licenses, approvals, processes, and information requirements.

h. The Project Team shall provide that all non-proprietary or non-privileged information on the project and the work of the Team is available to the public, to the extent allowed by law. Among other methods, the Project Team will develop and maintain an internet-based information system that links to the permitting processes and activities of state, federal, tribal, and local agencies. Such transparent information will help to develop a common understanding of the project among permitting agencies and with the public.

i. Project-specific agreements will be developed and may be modified or amended by written mutual agreement among the parties, and terminated by mutual agreement or after 30 days' written notice by any party.

j. Each Project Team shall establish procedures that can be used to address disagreements on subjects, including, but limited to, scheduling, data requirements, data adequacy and jurisdictional issues raised by the participating entities.

2. Western governors will work with grid organizations in the West, including the Western Electricity Coordinating Council, the Mid-Continent Area Power Pool, the Western Utility Group and any Regional Transmission Organizations that form in the West, and others to facilitate the exchange of information needed by appropriate federal, state, tribal, and local agencies for planning, siting, and reviewing permit applications.

3. The Federal Power Marketing Administrations (PMA) support efforts to streamline and expedite the transmission facility siting process. Each PMA shall review their siting process for federal interstate transmission lines in order to ensure the provision of timely notification and joint sharing of information, and to explore the possibility of consolidating required reviews.

4. Nothing in this Protocol shall be construed to limit, repeal, or in any manner modify the existing legal rights, privileges, and duties of the signatories to this protocol as provided by agreement, statute or any other law or applicable court decision. Nothing in this Protocol shall commit federal agencies to enter into any contract or other binding obligation.

5. Nothing in this Protocol may be construed to obligate the United States to any current or future expenditure of resources in advance of the availability of appropriations from Congress.

E. AUTHORITIES

The National Environmental Policy Act of 1969, 42 U.S.C. 4321, 4331(b) provides the authority for the Federal Government's participation in this Protocol. Additional authority is provided to the Bureau of Land Management under the Federal Land Policy and Management Act, 43 U.S.C. 1701, 1737 (b), to the Fish and Wildlife Service under the Fish and Wildlife Coordination Act, 16 U.S.C. 661, and to the Bureau of Indian Affairs under the Synder Act, 35 U.S.C. 2, 13, and 25 U.S.C. 324.

F. ADMINISTRATIVE PROVISIONS

1. The Governors intend that all states in the Western Interconnection sign the Protocol and will seek to secure the same from the appropriate federal agencies, tribal governments and Canadian provinces.

2. Each signatory to this Protocol will provide the Western Governors' Association with the name of a point of contact within the appropriate governmental agency for the implementation of this Protocol, including the necessary notifications herein.

3. Governors will give copies of this Protocol to state agencies with responsibilities for the review of transmission proposals.

4. Any party to the Protocol can unilaterally withdraw its participation in the agreement.

6. The Protocol can be amended or modified if all parties agree.

7. Upon signature, the protocol immediately will be effective and the Governors intend that executive orders or other administrative action to implement this Protocol be completed within 120 days of the signing.

8. The Western Governors' Association, through its affiliate, the Western Interstate Energy Board, will provide a report on the implementation of this Protocol at each annual meeting of the Association, and may provide interim reports as warranted.

9. The signatories will review the Protocol and its implementation on an annual basis.

Jane Dee Hull — 6/23/02
Chair of the Western Governors' Association — Date

Judy Martz — _____
Vice Chair of the Western Governors' Association — Date

Jim Geringer — 6/23/02
WGA Lead Governor for Energy — Date

John G. Kitzhaber — 6/23/02
WGA Lead Governor for Energy — Date

_____ for — 6/23/02
Secretary of Energy — Date

Mark Rey — 7/26/02
Secretary of Agriculture — Date

Gale Norton — 6/23/02
Secretary of the Interior — Date

[illegible] — 6/20/02
Chairman, Council on Environmental Quality — Date

[illegible] — 6/23/02

Harvey E Johnson — 6/23/02

Michael [illegible] — 6/23/02

Bill Owens. — 6/23/02

Dirk Kempthorne — 6/23/02

Kenny C Guinn — 6/23/02

Gary Locke — 6/23/02

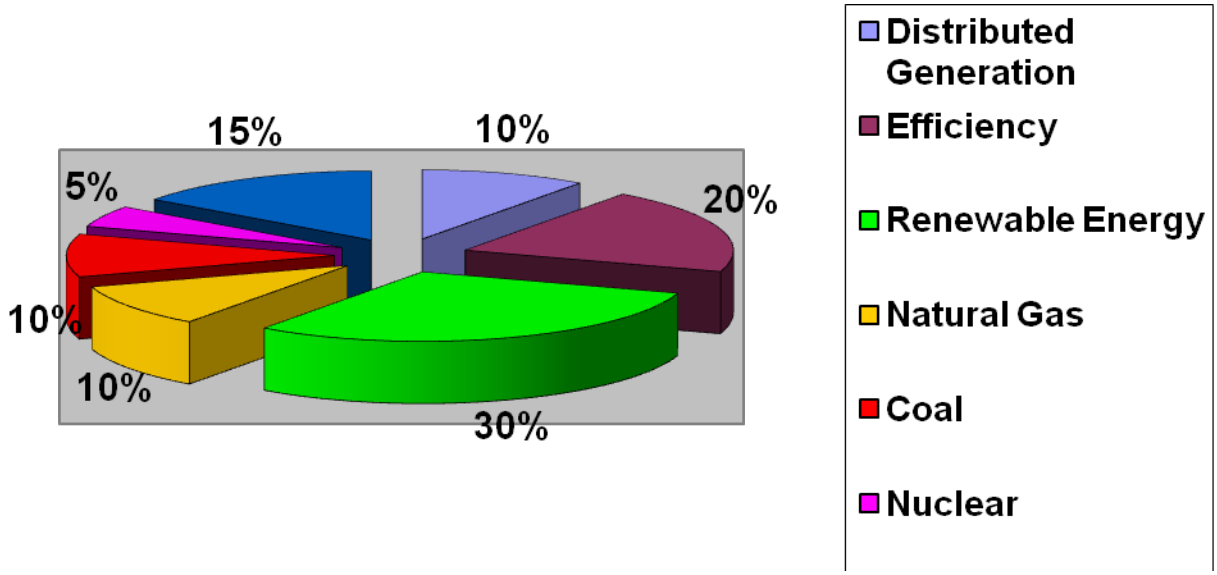
Gray Davis — 9/4/02

Exhibit 5 – Scenario Development for Identifying Megawatt Target

Scenario development would start with a west-wide load forecast for 2030. The 2030 scenario would include adding load requirements for vehicle electrification and targets to meet the carbon emission-reductions goals. Major resource components for scenarios would include: demand-side features (efficiency, demand management, distributed generation, smart grid and demand response, vehicle-to-grid, etc.); existing gas, coal, nuclear and hydro contributions; planned retirements for coal and other carbon-heavy power generation; and, the contribution of large-scale renewable energy resources such as solar. Different scenarios would include meeting state RPS requirements; using energy conservation, greatly increased efficiency and demand-side management to meet a large percentage of our resource needs; putting a price on carbon emissions; and retirement of existing coal plants to reduce greenhouse gas emissions.[i]

As a baseline, in 2007, electric generation in the western U.S. was comprised of: 31% coal; 31% natural gas; 23% hydro; 10% nuclear; and 5% renewables. For illustration purposes, a hypothetical scenario of resources to meet 2030 load is provided below.

Hypothetical Scenario of Resources to Meet 2030 Load in the Western Interconnection



BLM will benefit greatly from this exercise as part of the PEIS. Having a clear vision and goal will help the agency identify what its contribution should be toward an overall renewable energy goal. For example, a long-term clean energy vision for the West might result in the identification of 80,000 MW of newly installed renewable energy by 2030. This would include contributions from wind, solar and geothermal. Under this example, solar contributions might be estimated at 40,000 MW of the 80,000 MW total. If 25% of the solar contribution came from private and tribal lands, that would allow BLM in the PEIS to focus on finding sites appropriate for 30,000 MW of large-scale solar. With that type of a long-term and realistic target, BLM would have a much easier time of identifying already-disturbed sites and other locations with minimal resource conflicts to locate future projects. In addition, developing a long-term clean energy vision for the West with multiple scenarios would allow the agency to

focus on a much narrower set of corridors for transmission expansion, again allowing the agency to look at existing and already-disturbed corridors to facilitate solar resources.

[i] Forecasting energy demand and the associated levels of energy production on public lands is a very complicated and dynamic process that should be re-visited at regular intervals. For example the RETI process has revised its net short estimate at least once since the RETI process began.

Exhibit 6: Site-specific Comments on Solar Energy Study Areas – Arizona

The comments in this exhibit are a subset of comments prepared by the Sonoran Institute and are included with their permission. Please accept and fully consider these comments, submitted on behalf of the following groups: Arizona Wilderness Coalition, The Wilderness Society, Western Resource Advocates, and Wild Utah Project.

At the end of the document are narratives from site assessments Sonoran Institute conducted for the three AZ SESAs. Each assessment includes a set of accompanying maps. Due to the maps' size, we were unable to include these with our comments, but these can be requested by contacting John Shepard at the Sonoran Institute (520-290-0828).

I. Overarching concerns regarding SESAs in Arizona – impacts on wildlife corridors and habitat.

In identifying low known conflict areas that might be candidates for SESAs, the BLM relied on Arizona Department of Fish and Game (AZGFD) data that ultimately precluded significant amount of BLM lands from consideration as SESAs. We note that this data was used as part of the WGA's WREZ initiative, and that during that process concerns were raised that AZGFD may have overstated the amount of wildlife habitat that would be significantly impacted by solar energy development. As a result, the AZGFD agreed to revisit its findings.

Recommendations: The BLM should request that, once it has revisited its findings, the AZGFD provide the agency and make publicly available the multiple wildlife data layers that are part of its analysis, so that all interested parties have the opportunity to assess and prioritize the various wildlife values that will be under consideration as part of the PEIS.

II. Joint planning/venture opportunities with Arizona State Land Department

Given the fragmented nature of land ownership between the BLM and the Arizona State Land Department's trust lands, there are likely economies of scale and financial advantages to both agencies working together to identify and approve lands for solar siting. The three proposed SESAs in Arizona underscore this opportunity. Significant amount of trust lands are either immediately adjacent to or in close proximity to the SESAs. Moreover, the SESA's relatively small size and the likelihood that site constraints might be identified may lessen their viability for utility-scale solar projects. Collaborative planning between both agencies could expand siting opportunities on their lands, as well as enhance the appeal of these lands to solar developers by allowing one or more projects co-locate and share infrastructure.

Recommendations: The BLM should effectively engage the Arizona State Land Department as a cooperating agency and, if the Land Department consents, consider extending the PEIS to include trust lands adjacent to SESAs as a precursor to collaborative planning.

III. Site-specific Issues

a. Gillespie SESA

The current configuration of this SESA (narrow width and scenic road bisecting the proposed area) would appear to present problems for siting a utility-scale project. We would request that the BLM consider possible adjustments to the area's boundaries away from Webb Mountain and closer to the transmission corridor, including moving the north-eastern boundary toward the natural gas pipeline and using scenic road as southern boundary.

We note that trust lands lie north of the proposed area. (If reconfigured as we suggest, these trust lands would be immediately adjacent to the area's boundaries.). We would encourage the BLM to include an alternative in the PEIS which analyzes the development of these lands as part of a joint planning effort between the BLM and the Arizona State Land Department.

The area falls within the Phoenix Active Management Area, so there are some restrictions on what water resources might be available for a utility-scale solar plant. We do note that the proposed area is located south-west of an area identified by Arizona Department of Water Resources as experiencing significant subsidence (primarily west of Arlington School Road). The PEIS should assess the impact that a utility-scale, wet-cooled solar plant's groundwater pumping will have on subsidence rates on nearby lands.

Recommendations: The PEIS should consider reconfiguring the Gillespie SESA's boundaries away from Webb Mountain and closer to the transmission corridor, consider expanding the PEIS to include trust lands (with the Land Department's consent), and assess potential impacts of water use for utility-scale solar development .

b. Brenda SESA

We suggest that the BLM consider possible boundary adjustments in order to preserve the wash and drainage area in northwest corner, which may involve aligning the western boundary with Avenue 42 East and moving southern boundary toward U.S. 60.

We note that trust lands lie immediately north and east of the proposed area's current boundaries. We would encourage the BLM to include an alternative in the PEIS which analyzes the development of these lands as part of a joint planning effort between the BLM and the Arizona State Land Department.

We also note that the proposed area lies adjacent to a large BLM Solar Energy ROW application (#AZA 034750) that is now closed. This demonstrated interest by industry in developing solar projects on these adjacent lands, in addition to the likelihood that they may have similar characteristics to the Brenda SESA, warrant their consideration as

potential SESA lands. We recommend that the BLM evaluate the lands covered under this application for inclusion in the Brenda SESA or as a separate SESA.

Recommendations: The PEIS should consider reconfiguring the Brenda SESA's boundaries to preserve wash and drainage areas, consider expanding the PEIS to include trust lands (with the Land Department's consent), and consider expanding or creating a separate SESA to include all or a part of the lands included in the closed ROW application (#AZA 034750).

c. Bullard Wash SESA

There is a significant Joshua Tree forest on the northern portion of the area. We would request consideration of a boundary adjustment in order to preserve this forest. Also, there appears to be some overlap between the area's northwest reach and a wildlife linkage corridor as identified by Arizona Game and Fish and the Arizona Department of Transportation.

We note that trust lands lie immediately west, east, and south of the proposed area's current boundaries. We would encourage the EIS to include as an alternative the development of these lands as part of a joint planning effort between the BLM and the Arizona State Land Department.

On July 1, 2009, during a site visit of the SESA, a Southwest Willow Flycatcher was observed flying over the parcel, but no nests were identified. The BLM should analyze any potential impacts to Southwest Willow Flycatcher habitat as part of the PEIS.

Recommendations: The PEIS should consider reconfiguring the Brenda Wash SESA's boundaries to preserve the Joshua Tree forest on its northern edge and consider expanding the PEIS to include trust lands (with the Land Department's consent).

IV. Consideration of additional SESAs

Because the BLM's stated goal of identifying and analyzing SESAs in the PEIS is to determine the most appropriate locations for solar development on public lands, it is critical that a robust set of SESAs be identified and development be guided to these lands. A description of the methodology used by Arizona BLM to identify the three Arizona SESAs (Attachment A, attached) indicates that there were five other SESAs identified through the screening process. These SESAs were not included in the SESAs published for public comment because of overlap with existing solar ROW applications. Overlap with existing ROW applications was not included in the exclusion criteria directed by the BLM WO to the states, and any such overlap does not diminish an area's potential to be a successful SESA. In fact, SESAs included for public comment in several other states overlap with existing ROW applications. The BLM should analyze these additional five areas for potential inclusion as SESAs.

Recommendations: The BLM should analyze the additional five areas identified in the Arizona BLM screening process for potential inclusion as SESAs.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Kevin Gaither-Banchoff, Executive Director
Arizona Wilderness Coalition
P.O. Box 40340
Tucson, AZ 85717

Tom Darin, Staff Attorney, Energy Transmission
Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

SESA Site Assessments

BRENDA SOLAR ENERGY STUDY AREA

Field Investigation
July 2009
Sonoran Institute

SUMMARY: Brenda Solar Energy Study Area of approximately 4,325 acres on BLM land.

LOCATION: The Solar Energy Study Area (SESA) is 115 miles west of Phoenix and is two miles east of Brenda, AZ, in La Paz County. Site is 15 miles east of Quartzsite and 30 miles west of Salome AZ. Highway US 60 is one mile south of the site. Ave 42E bisects the west side of the area, while Ave 47 and Bouse Wash are on the eastern side of the site. Brenda is three miles north of Interstate 10 but lacks an exit. Central Arizona Project (CAP) is five miles east of SESA. Bear Hills are one mile west and south. The

Ranegras Plain follows Bouse Wash northwest to southeast. See T4N, R16W Sections 1-5, 8,9,10 & T5N R15W Section 31.

Brenda SESA is overlaid with Pending Solar Application AZA 035155. Site was surrounded on east, south, and west by BLM ROW Solar Energy Application AZA 034750, which is now closed. The SESA is bordered by BLM land, private land on southeast, and State Trust land on north.

TRANSMISSION CORRIDORS: South of the Brenda SESA is a proposed WWEC transmission corridor that runs parallel with Interstate 10. This corridor is 3 miles south of SESA. Paralleling US 60 is lower voltage transmission line in a corridor one mile south of Brenda SESA.

INSOLATION: The west half of the area is rated at 7,341 watt-hours / per sq. meter/ day of incoming solar radiation. The east half of the SESA is rated at 7,297 by National Renewal Energy Laboratory (NREL) modeling.

CLIMATE: In this region, of the Sonoran Desert, precipitation ranges from 3.7 - 13.4 inches per year. To the east, a 100-year precipitation average of 6.8 inches per year is recorded for Salome, AZ. (Brenda lacks weather station.) However, the Brenda SESA borders the Lower Colorado River Subdivision that records even lower amounts of annual rain. Cloud free days dominate. Summer temperatures can reach over 114 degrees. Drought for past decade has stressed this region.

SOILS: In this area an alluvial fan stretches from the nearby volcanic mountain range south and east to a plain that has a gradual slope towards Bouse Wash. This site contains a top level of small, darkened 'varnished' basalt rocks. This layer forms 'desert pavement.' This unique layer comes from the erosion of parent mountains and is bound together by fine grain soil. By providing a crust that stabilizes sand and dirt, this layer results in erosion and dust control, and is a rare scenic feature. Patches of desert pavement stretch diagonally across the Solar Study Area to Bouse Wash. In the lowest elevation, like the Bouse Wash floodplain and Ranegras Plain, soft 'flour like' soil caps the alluvial basin. (Soil resource for this region is under study. No data is currently available from National Resource Conservation Service.)

SLOPE: The 4,325 acre SSA slopes < 3 percent gradually south west to north east across 5.5 miles of bajada and alluvial plain to Bouse Wash. One major wash (not named) on the west side and many arroyos (gullies) divide the site diagonally.

VEGETATION: Within the Lower Colorado River Valley Subdivision, this area also includes some flora of the neighboring Arizona Upland Subdivision of the Sonoran Desert. This region of bajadas and desert plains is characterized by creosote bush, triangle bursage, ironwood, and buckhorn cholla. Additions (from AZ Upland) include saguaros and ocotillo.

Cattle grazing allotments and terrain are key factors affecting the Sonoran desert vegetation within the SESA. The western points visited show a long history of grazing. Additional stress due to a decade of drought has resulted in sparse amounts of small bushes and grasses. Today, the west side corral and tank is maintained. These improvements are inside the Brenda Solar Energy Study Area. Similar effects of significant cattle grazing were found inside the northeast corner of the SESA and along a small mesquite bosque near Bouse Wash. Retirement of one or more cattle allotments may affect land outside of the SESA.

The creosote bush-dominated desert floor is divided by numerous small washes that are lined with Palo Verde, mesquite, and ironwood trees, plus compass barrel, buckhorn cholla, and saguaro cactus. In this area, these small, but numerous, washes are the arteries between the peninsulas of the 'desert pavement' in the topography of this part of the Sonoran Desert environment. Studies show that desert regions like this one can only support vegetation on less than 30% of the surface.

Broken surface allows invasive (non-native) plants to out compete native plants in areas that have been disturbed. Invasive plants (like Tamarisk) have already affected roads, development sites, and abandoned farm land in this region.

Significant amount of abandoned farmland exists near east side of Solar Energy Study Area.

WILDLIFE: Evidence of jackrabbits, gophers, lizards, coyote, doves, and turkey vultures were found during short hikes into the SESA. Arizona Game & Fish Department analysis of this area lists Species of Concern: Sonoran Desert Tortoise. BLM has given this area a "sensitive" designation for the Sonoran Desert Tortoise.*

HISTORIC: Plomosa Windmill, cattle tank, and corral on west side of Solar Study Area are over 50 years old. The Ranegras Plain follows Bouse Wash. Ranegras is described as a corruption of a Hualapai word (hanagas) which means "good". The possibility that General Patton trained troops near the SESA relates to a historic structure and known activity north and south of SESA.

ECONOMIC: This site is remote. Few residents live in this region. Once based on mining, Brenda is now tied to tourism and winter snowbirds via three large, and several small, RV Parks, plus a restaurant and vehicle repair shop. Salome and Quartzsite are larger towns but are outside of this region. Abandoned farm land exists east of the Bouse Wash. A sewage sludge disposal plant northeast of area may represent the region's only industry. Further east a group of cattle feed lots exist along Vicksburg Road. Unincorporated Brenda is in the Salome Consolidated elementary and high school district.

REMAINING POINTS: The Brenda SESA shows considerable stress from cattle grazing and drought. In this region, a considerable amount of farmland is fallow. Questions exist regarding hook-up to 500kV Transmission Corridor along with

competition with neighboring ROW application. Review of possible cultural resource, grazing allotment(s), land subsidence, and groundwater or CAP resource for SESA are still needed. Brenda SESA is Department of Defense Airspace Consultation Area.

*Arizona Game & Fish Department web site & on-line environmental review tool. Data from AZGFD Heritage Data Management System.
(Updated 0909.)

BULLARD WASH SOLAR ENERGY STUDY AREA

Field Investigation
July 2009
Sonoran Institute

SUMMARY: Bullard Wash Solar Energy Study Area covers 8,203 acres of BLM land.

LOCATION: Bullard Wash Solar Study Area (SESA) is approximately 20 miles northwest of Wickenburg, AZ, in Yavapai County. North access of the area is via Highway 93, a.k.a. Joshua Tree Parkway, and Alamo Road, which runs parallel with the north edge of SESA. Bullard Wash is near the southern boundary. Tres Alamos Wilderness is five miles north. Harcuvar Mountain Wilderness and Bullard Peak (3,124 elevation) are six miles southwest of SESA. See T9N, R9W Sections 1-5, 7, 9, 10, 22-25. Pending ROW Solar Application AZA 035156 overlays much of this SESA.

TRANSMISSION CORRIDORS: A transmission corridor that contains two 500kV lines is five miles east of SESA. (The corridor runs north south).

INSOLATION: The north 80% is rated at 7,500 and 7,498 watt-hours / per sq. meter / day of incoming solar radiation. The southern 20% is rated at 7,389 by National Renewal Energy Laboratory (NREL) modeling. This SESA has the highest insolation of the three study areas.

CLIMATE: In this region, of the Sonoran Desert, precipitation averages 11.2 inches per year (Wickenburg, AZ). This is nearly twice the rain fall that the other two SESA receive annually. Summer temperatures can reach over 109 degrees. Drought for over the past decade may have stressed this region. Estimated 200-240 frost-free days.

SOILS: The Basin and Range Province provides deep alluvial valleys with through-flowing drainage. In this area, fine to medium textured soils are well drained alluvium made of sands and rocks. South of the SESA, on the desert floor, fine 'flour like' soil caps the basin. Whitlock or Whitlock Anthony gravelly sandy loam and Mojave sandy loam dominate the SESA.

SLOPE: Bullard Wash is a 8,203 acre SESA that slopes gradually from northeast to southwest at < 3 percent. Many minor washes and arroyos divide the site northeast to southwest with small undulations.

VEGETATION: The elevation of the SESA is 2,851' vs. 1,117' of Phoenix. Area combines the flora of the Arizona Upland Subdivision of the Sonoran Desert with a mingling of plants, like Joshua tree, tied to the Mohave Desert.

The SESA is characterized by a transition zone that combines velvet mesquite, creosote bush, triangle bursage, ocotillo, hedgehog, fishhook barrel, compass barrel, buckhorn cholla, and saguaro cactus with, soaptree yuccas, tall grasses, and Joshua trees.

This unique combination of plants is reduced within the area as it slopes southwest to an elevation approximately 450 feet lower. The SESA north boundary is approximately ½ mile south of the unmaintained Alamo Road. This separates the SESA from the road and the highest quality vegetation but does not remove it completely from the transition zone. However, the southern (and lower) half of the SESA lacks the flora diversity seen in the north half. There, creosote dominates the plain.

While cattle grazing allotment(s) cover this entire SESA and are combined with neighboring State Trust allotment(s), the effects are spread over a large and relatively lush desert environment. The west tank (on private land in holding) shows decades of damaging cattle traffic. However, other stock tanks show less damaging impacts. Cattle grazing allotment(s) and terrain are key factors affecting Sonoran desert vegetation within the SESA. Retirement of one or more cattle allotments may affect more land than just the SESA.

WILDLIFE: Evidence of jackrabbits, lizards, coyote, ringtail cat, deer, doves, Swainson's hawk, southwestern willow flycatcher, and turkey vultures were seen during visits. Numerous examples demonstrate the quality of the environment and a wide variety of wildlife. This area is part of Arizona Game & Fish Department (AZGF) Hunting Unit 44A. Analysis by AZGF of this area lists Species of Concern: Sonoran Desert Tortoise, Banded Gila Monster, California Leaf-Nosed Bat, Cave Myotis (bat). Endangered: Desert Pupfish and Gila Topminnow*. BLM "Sensitive" designation for Sonoran Desert Tortoise, and Leaf-Nosed Bat.

HISTORIC: Corral in north half of SESA is over 50 years old. Small amounts of historic debris were found at the corral and two camp sites. No other historic resources were found except for three dammed wash-style water tanks. No analysis was made regarding cultural resources.

ECONOMIC: This site is remote. No residents live in this region. Mines exist; however, few if any are active. Ranching is active on many, maybe even most, of the allotments on BLM and State Trust land within this region. The SESA is within Congress (AZ) Elementary School District.

REMAINING POINTS: Ground water resource and cultural resource are unknown at this time. The remote location, rugged terrain, and large (8,203 acre) size make this a difficult SSA to appraise. During both visits training flights of two F-16's from Luke Air Force Base were seen over this SESA and neighboring Wilderness Areas. The Bullard Wash SESA is within the Department of Defense's Airspace Consultation Area.

* Species of Concern (SC) term defined under Endangered Species Act – Arizona Game & Fish Department web site & on-line environmental review tool. Data from AZGFD Heritage Data Management System.

GILLESPIE SOLAR ENERGE STUDY AREA

Field Investigation
July 2009
Sonoran Institute

SUMMARY: Proposed BLM Gillespie Solar Energy Study Area of approximately 3,790 acres.

LOCATION: The Solar Energy Study Site (SESA) is 50 miles west of Phoenix and southwest of Arlington (valley) AZ in Maricopa County. The east edge of the SESA is two miles west of the Gila River and Old US 80 Highway. After four miles Agua Caliente Scenic Road reaches the SESA. Site includes portions of sections in T2S, R6W & T2S, R7W.

Nearby Pending ROW Solar Energy Applications include: AZA 035157 (includes part of SESA) and AZA 035166 directly north of Gillespie SESA; AZA 034799 and AZA 034758 are northwest of the SESA (four and nine miles respectively); and closed application AZA 034806. Palo Verde Nuclear Generating Station and PV/Salt River Project transmission hub are nine miles north.

The Gillespie Solar Energy Study Area is two miles north of Webb Mountain and Woolsey Peak Wilderness, three miles northeast of Signal Mountain Wilderness, and four miles east of Arizona Game and Fish Department Gila River Wildlife area.

TRANSMISSION CORRIDORS: Two 500kV Transmission Corridors border the SESA. One touches the east corner. Another 500kV line runs parallel with the west end of the SESA and has been approved for expansion by 2012. This corridor includes Southern Pacific Rail Road track. El Paso Natural Gas lines run parallel with the SSA one mile north of the boundary. El Paso Natural Gas Gila Station (compressor site) is one mile from north east corner of the SESA.

INSOLATION: The west half of the area is rated at 7,431 watt-hours / per sq. meter / day of incoming solar energy. The east half of the area is rated at 7,364 by National Renewal Energy Laboratory (NREL) modeling.

CLIMATE: In this region of the Sonoran Desert, precipitation averages 7.5 inches per year to the north (Tonopah) and 6.1 inches to the south (Gila Bend). Cloud free days dominate. Summer temperatures can reach over 113 degrees. Drought for over that past decade has stressed this region. Region is rated at 260-320 frost-free days.

SOILS: The region hosts patches of cryptobiotic soil. Portions of this area expose a top level of small, darkened ‘varnished’ basalt rocks. This layer forms ‘desert pavement’. This layer comes from the erosion of parent mountains and is bound together by fine grain soil. This rare feature provides a crust that stabilizes sand and dirt, plus it provides

a unique type of erosion and dust control. The area also includes well-drained soil dominated by extremely gravelly course sandy loam of Gunsight Cipriano complex.

SLOPE: In this basin and range region, the SESA is dominated by nearby volcanic mountain ranges south and west of the area. Webb Mountain drains north toward the SESA where a major wash bends around an escarpment and divides the east half from the west half. This 'terrace' makes up the largest part of SESA and allows a gradual slope north for two miles toward Centennial Wash.

The western part of the SESA has a gentle slope of < 3 percent with only arroyos (gullies) dividing the area. However the 3,790 acre SESA is divided by a significant wash and undulating terrain in the middle of the area. Parts of this middle band have slopes of 3-7 percent. While the narrow eastern extension of the SESA is again flat at < 3 percent slope.

VEGETATION: This area contains the flora common to the Arizona Upland Subdivision of the Sonoran Desert. This region's bajada is characterized by plants like creosote bush and triangle bursage; trees like mesquite, ironwood, and Palo Verde, plus cactus like barrel, cholla, and saguaro. Due to cattle grazing allotment(s) and terrain, the vegetation variety and density varies within this area. A long history of grazing is shown by a lack of small plants like triangle bursage. A decade of drought may also contribute to sparse amounts of bushes and grasses. Retirement of cattle allotment(s) may affect more land than just the SESA.

The 'flat top terrace' of the escarpment (the western half of SESA) is dominated by creosote bush but also supports scattered buckhorn and pencil cholla plus saguaro cactus that line the arroyos.

Invasive (non-native) plants compete with native plants in areas that have been disturbed and can be a development issue. Roads, abandoned farm land, and developed property have been affected by invasive plants in this region. One plant is listed on Arizona Game & Fish Department (AZGFD) web site for this specific area is Straw-top cholla (native plant law 'salvage restricted; collection only with permit').*

WILDLIFE: Evidence of jackrabbits, gophers, lizards, coyote, deer, doves, road runner, red tail hawk, and turkey vultures were seen during short hikes into this area. AZGFD analysis of this area lists Species of Concern as Sonoran Desert Tortoise, California Leaf-Nosed Bat, Cave Myotis (bat). Listed as Endangered under ESA: Southwestern Willow Flycatcher, Yuma Clapper Rail. BLM "Sensitive" designation for Sonoran Desert Tortoise, California Leaf-Nosed Bat*.

HISTORIC: Agua Caliente Scenic Road (BLM defined) bisects half of the study area. It has experienced several alignments since the 1920's. Near the road, a small debris site inside the SESA could be from 1930's. Poison Well, over 50 years old, (historic), is near SESA southeast corner. Outside the SESA are a dozen small mines that dent the earth's

surface near Webb Mountain. The Gillespie Dam trestle bridge and Enterprise Canal (1886) are historic features three miles east of SESA.

ECONOMIC: No residents live close to this remote site. Mining was short lived in this region. However, farming in nearby Arlington Valley along the Gila River has over a 100-year history. Ranching on tracts of private, BLM, and State Trust land continues. The Desert Rose restaurant & bar, a post office, the Hassayampa General Store, a small feed lot, and a grade school are all located nearby. Abandoned cotton gin site and abandoned farm land exist (private and State Trust land) in this region. Area is within Arlington Unified School District (elementary) and Buckeye Union High School District.

REMAINING POINTS: The Gillespie SESA shows stress from cattle grazing and drought. In this region significant farmland is fallow. Cultural resource, grazing allotment(s) and ground water resources need further evaluation. El Paso Pump Station near east SESA boundary has EPA posting regarding Chromate discharge from plant. Remediation and off-site ground water monitoring continues. Gillespie SESA is over-flight zone for Luke AFB and considered an Airspace Consultation Area by Department of Defense.

*Arizona Game & Fish Department web site & on-line environmental review tool. Data from AZGFD Heritage Data Management System.

Exhibit 7: Site-specific Comments on Solar Energy Study Areas – California

Please accept and fully consider these comments, submitted on behalf of the following groups: The Wilderness Society, Mojave Desert Land Trust, Defenders of Wildlife, Desert Protective Council, California Wilderness Coalition, California Native Plant Society, Wild Utah Project, and Californians for Western Wilderness.

Introduction

In response to BLM interest in siting criteria for solar projects on public lands, a number of organizations[1] including NRDC and The Wilderness Society developed a list of criteria specifically designed for use by the BLM to identify appropriate areas for solar development in the California Desert Conservation Area (CDCA). These criteria were developed with input from conservation professionals, biologists and other scientists familiar with the CDCA and its land resource values. They were designed to aid in the identification of lands potentially suitable for solar energy development with the least amount of environmental conflict. The criteria were designed primarily to "filter out" lands having high environmental resource values and high sensitivity with respect to relatively large-scale land-disturbing activities. The criteria are attached as Attachment A.

The siting criteria were developed with the following assumptions:

1. The criteria are to be used in the identification of potentially suitable public lands administered by BLM in the CDCA.
2. Public lands within the Solar Energy Study Areas that meet the siting criteria attached to these comments should be given the highest priority for solar energy development by the permitting agencies.
3. Public lands meeting the siting criteria but located outside the four SESAs currently proposed should also be considered for Solar Energy Study Areas.

The BLM should use these siting criteria in order to minimize environmental concerns and facilitate development of environmentally responsible solar projects in a timely manner. The criteria facilitate distinguishing between public lands as follows: 1) Public lands in the CDCA that are not suitable for solar energy pilot projects, and 2) Public lands in the CDCA that are potentially suitable for such development.[2]

Analysis

We applied the siting criteria to the four proposed SESAs in California using GIS analysis. In order to minimize environmental conflicts, the proposed SESAs should be modified to address the concerns identified below. It is important to note that there are

[1] In alphabetical order: California Wilderness Coalition, Center for Biological Diversity, Defenders of Wildlife, Desert Protective Council, National Parks Conservation Association, Natural Resources Defense Council, Sierra Club, The Nature Conservancy, The Wilderness Society, The Wildlands Conservancy, Western Watersheds Project.

[2] Public lands described in the criteria are represented by specific names commonly used in the CDCA Plan and other planning/environmental review documents. We use these names to represent actual public land areas within the CDCA rather than list lands by legal description.

some discrepancies between GIS shape files for cultural resources and mapped cultural resources in BLM documents. Better data are needed on these important resources. It is critical that the BLM consult with tribal chairpersons to obtain clarification on the location of all significant cultural sites.

We are providing as Attachment B the map *"Potential Solar Energy Study Areas"* that was previously submitted by environmental stakeholders to the BLM in May 2009. The map has one revision -- the Imperial West area no longer appears on the map as a viable solar energy study area due to new information regarding the occurrence of species of concern in this area.

Proposed California SESA Comments

Iron Mountain SESA: We recommend eliminating this SESA due to the high occurrence of sensitive resources and general inconsistency with our siting criteria, as follows:

- Includes lands in Citizens Wilderness Inventory
- Inadequate electrical transmission facilities
- Connectivity and biological linkage in the ecotone between the Mojave and Colorado Deserts (opportunities exist to improve biological connectivity across the MWD Aqueduct for the desert tortoise, bighorn sheep and other wide-ranging species)
- Desert tortoise habitat in the western, northwestern and northeastern areas
- Mojave fringe toed lizard, desert rosey boa, desert night lizard present
- Western edge overlaps with known range of bighorn sheep
- Possible conflict with Patton's Iron Mountain Divisional Camp ACEC [3]
- This area has been identified by Native American tribes as having great cultural significance[4]
- Large drainage which functions as an ephemeral stream
- Very good occurrence of the dune interior verbena - FWS special status and BLM special management
- Numerous occurrences of other rare plants[5]

---

[3] Patton's Iron Mountain Divisional Camp overlaps southwestern portion of SESA. The boundaries of the ACEC are outside the SESA but the cultural polygon that we have in GIS overlaps - need clarification on cultural resources within study area. Mojave Desert Land Trust. (2008). *A Constraints Study of Cultural Resource Sensitivity within the California Desert*. Unpublished manuscript. p. 33. Attachment C.

[4] The Salt Song Trail incorporates the sacred landscapes and cultural areas of the Nuwuvi, Southern Piute (14 bands) across four states. These landmarks are described in the Nuwuvi Salt Songs and represent ancient villages, gathering sites for salt and medicinal herbs, trading routes, historic sites, sacred areas, ancestral lands and pilgrimages in a physical and spiritual landscape of stories and songs. Bands outside California may also have an interest in siting of energy projects and utility corridors. Source: The Cultural Conservancy, San Francisco State University Department of American Indian Studies. The Salt Song Trail Project – contact Philip Klasky pklasky@igc.org (415) 561-6594. For information on importance of the Iron Mountain and Ward Valley area contact The Native American Land Conservancy, Kurt Russo, Ex. Dir. frkvalues@aol.com, 800-670-6252.

[5] CNPS listed plants - Androstephium breviflorum (CNPS List 2.2, State Rank S1.2) Eriastrum harwoodii (CNPS List 1.B, State Rank S2, Global Rank G2). Iron Mountain is largely unknown in terms of botanic resources.

- Probable bighorn sheep movement corridors[6]
- Visual impacts as identified in CEC letter to the Renewable Energy Transmission Initiative dated November 19, 2008 (p.4) (Attachment D)

Riverside East SESA: The SESA in eastern Riverside County should be reduced to avoid impacts to sensitive resources identified below:

- Desert Tortoise Critical Habitat outside ACEC in western and southern areas
- Desert tortoise habitat in the western, northwestern and northeastern areas[7]
- Connectivity and biological linkage for desert tortoise:
    - between the Northern Colorado and Eastern Colorado Recovery Units[8]
    - between the Chuckwalla and Chemehuevi Critical Habitat Units
- Microphyll woodland habitat and newly discovered plant species surrounding Palen Dry Lake
- Western half of the study area is heavy microphyll woodland and is on transition zone between Mojave and Sonoran ecoregions
- Probable important linkage function provided by Pinto Wash, a large wash on the far northwestern boundary which drains into Chuckwalla Valley
- Many cultural and archaeological resources:
    - Sidewinder Well ACEC and Palen Dry Lake ACEC and shoreline contain prehistoric habitation sites, mesquite processing sites and lakeshore sites[9]
    - Ford Dry Lake may contain potentially important cultural resources[10]
    - Colorado Desert aboriginal trails
    - The South McCoy Mountains may contain potentially important cultural resources[11]
    - Possible Papago Creation site north of Desert Center[12]
    - Overlaps with the boundaries of historic Camp Rice, that has been recommended eligible for the National Register of Historic Places[13]
- Southeastern portion of Joshua Tree National Park
- Probable bighorn sheep movement corridors[14],[15]

---

[6] Bare *et al*. (2009). *Cumulative Impacts of Large-scale Renewable Energy Development in the West Mojave.*

[7] (CNDDB 2009)

[8] This linkage was used by the USFWS to justify combining these two recovery units in the recent Draft Revised Recovery Plan)

[9] Mojave Desert Land Trust. (2008). p. 34.

[10] *Ibid*. p. 35.

[11] The McCoy Wash Petroglyph Site is located in this area, but the petroglyph site is included inside the McCoy Mountains wilderness area and does not overlap with the proposed SESA boundary. The area around the petroglyph site is extremely sensitive to any ground disturbance. Mojave Desert Land Trust. (2008).

[12] Location has been identified based upon public concern for the location. Research regarding the site needs to be conducted. Mojave Desert Land Trust. (2008). p.45.

[13] Part of the World War II (WWII) Desert Training Center/ California–Arizona Maneuver Area

[14] Bare, L., Bernhardt, T., Chu, T., Gomez, M., Noddings, C., Viljoen, M. (2009). *Cumulative Impacts of Large-scale Renewable Energy Development in the West Mojave: Effects on habitat quality, physical movement of species, and gene flow.* Unpublished manuscript, University of California, Donald Bren School of Environmental Science and Management, Santa Barbara, CA. Attachment E.

- Yellow warbler and Mojave fringed toed lizard occupy Carl's Dunes (adjacent to Blythe)
- Rare plants occurrences and habitats[16]
- Important biological connectivity for all plants and animals between the Mojave and Colorado Deserts[17]

Pisgah SESA: We recommend reducing this study area to avoid impacts to the following:

- Rare plant occurrences and habitats[18]
- Desert Tortoises and habitat, and associated movement corridor along the western edge of the Cady Mountains that provides biological connection between the Ord-Rodman and Superior-Cronese Critical Habitat Units
- Sensitive cultural resources sites[19]
- Significant drainage from the Cady Mountains (not yet mapped by the National Wetlands Inventory)
- Pisgah lava flow (site of current research into biological evolution)
- Two sections of former Catellus lands acquired for purposes of conservation of habitat and the associated species

Imperial East SESA: Based on currently available information there are few anticipated resource conflicts with this proposed SESA:

- Flat-tailed horned lizard range, but not in a designated Flat-tailed Horned Lizard Management Area
- Field research is being conducted by the California Native Plant Society to determine if special status plants occur here

Additional Areas for Study

The Solar PEIS must include a robust alternatives analysis to comply with NEPA requirements and each "action alternative" should include alternative SESAs for

---

[15] Epps, C., Wehausen, J.D., Bleich, V.C., Torres, S.G., Brashares, J. S., "Optimizing dispersal and corridor models using landscape genetics," Journal of Applied Ecology 44 (2007): 721.

[16] The sand dune habitats at the eastern end of the Eagle Mountains currently support 2 CNPS listed rare plants (Cryptantha costata, Eriastrum harwoodii), and one watchlist plant (Astragalus aridus). Other CNPS listed species impacted are: Cryptantha costata, CNPS List 4.3, Proboscidea althaeifolia, a CNPS List 4.3 plant, Colubrina californica, Senna covesii, Ditaxis californica, Ditaxis claryana, Abronia villosa var. aurita, Hymenoxys odorata, Teucrium cubense ssp. depressum, Wislizenia refracta ssp. refracta, Grusonia parishii, Astragalus insularis var. harwoodii, Corypantha alversonii, Castela emoryi.

[17] Opportunities exist to improve biological connectivity across the I-10 corridor for the Desert Tortoise, Bighorn Sheep and other wide-ranging species.

[18] Very good occurrence of white margin beard tongue in northeastern part of SESA and in Lavic Lake/Pisgah Crater. Rare and special status plants: Penstemon albomarginatus, a CNPS List 1B.1, Androstephium breviflorum, Castela emory CNPS listed.

[19] Trails out of the Cady Mountains towards Cronese Dry Lake and obsidian chipping sites; Troy Lake on western edge has not been surveyed to professional standards. This area contains geoglyphs, habitation sites, lithic scatters, rock art, and isolated hearths on both sides of Interstate 40. Troy and Cronese Dry Lakes need to be thoroughly inventoried. Research regarding the site needs to be conducted. Mojave Desert Land Trust. (2008). p.45.

consideration. Using the same siting criteria applied to the four proposed SESAs, we have so far identified three additional areas in the CDCA that may be appropriate for solar development. These areas contain significant amounts of public land that could be aggregated with adjacent private land for solar development, contain little or few resources of concern, and are near existing electrical transmission facilities. They are shown on the map provided as Attachment B.

Antelope Valley
The Antelope Valley in Kern County meets several key criteria for environmentally responsible solar energy development. It is comprised of large expanses of abandoned agricultural lands, is near existing transmission lines, and is near urban areas where ample housing is available. The Antelope Valley appears to be an important, strategically located area for potential long-term solar energy development that could be addressed through a partnership involving the Department of Energy, state and local agencies, and BLM.

The Antelope Valley area contains 4,040 acres of public land and there are 82,379 acres of private land in the immediate vicinity that may also be appropriate for solar development.

Chocolate Mountains
Portions of the East Mesa near the Coachella Canal, which we are calling the Chocolate Mountains Area, should be considered as a possible SESA. This area contains 6,370 acres of public land, and there are 7,068 acres of private land in the immediate vicinity that may also be appropriate for solar development. It should be noted that this area has the potential to contain archeological sites on the east and west side of the Salton Sea.[20] A cultural survey and consultation with the Argonne people would be necessary in this area.

Westmoreland
The Westmoreland area contains 4,460 acres of public land that should be considered as a possible SESA, and there are 582 acres of private land in the immediate vicinity that may also be appropriate for solar development.

Conclusion
The BLM must provide clear rationales for selection of criteria and methodology for applying those criteria to support decisions made regarding the SESAs and their possible designation as Solar Energy Zones. We strongly recommend that the BLM use the attached siting criteria and the GIS data provided by numerous NGOs in California to make its analysis as robust and thorough as possible. The criteria represent the very hard work of numerous organizations and reflect the shared expertise of conservation professionals, biologists and other scientists familiar with the CDCA and its land

[20] The area has the potential to contain "archeological sites, including fish traps and rock art which are within the band of shoreline sites in Imperial County that have not been previously noted in the archeological record. These sites are on the east and west side of the Salton Sea and should be noted as significant features on the landscape. The sites should be considered to be fragile and are in need of documentation." Mojave Desert Land Trust. 2008. p. 45.

resource values. Our organizations believe that there are opportunities to develop utility-scale solar projects in low conflict areas on public lands in California, and we look forward to working with the BLM and its partners to find these appropriate locations.

Sincerely,

Alice Bond, California Policy Analyst
The Wilderness Society
655 Montgomery St., Suite 1000
San Francisco, CA 94111

Pat Flanagan, Resource Advocate
Mojave Desert Land Trust
6393 Sunset Road
Joshua Tree, CA 92252

Peter Nelson, Federal Lands Program, Director
Defenders of Wildlife
1130 17th Street N.W.
Washington D.C. 20036-4604

Nick Ervin, Board of Directors President
Desert Protective Council
P.O. Box 3635
San Diego, CA 92163

Monica Argandona, Desert Program Director
California Wilderness Coalition
167 N. Third Avenue, Suite M
Upland, CA 91786

Greg Suba, Conservation Program Director
California Native Plant Society
2707 K Street
Sacramento, CA 95816

Michael J. Painter, Coordinator
Californians for Western Wilderness
P.O. Box 210474
San Francisco, CA 94121

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

Exhibit 8: Site-specific Comments on Solar Energy Study Areas – Colorado

Please accept and fully consider these comments, submitted on behalf of the following groups: The Wilderness Society, Center for Native Ecosystems, Colorado Environmental Coalition, Western Resource Advocates, and Wild Utah Project.

Overall, the four Solar Energy Study Areas (SESAs) identified in Colorado appear to have been well selected to avoid insurmountable conflicts with other resources and values, and we support their inclusion and detailed analysis in the Draft PEIS. However, there are resource concerns for all of the Colorado SESAs which will need to be addressed with detailed analysis and proposed impacts minimization and mitigation strategies in the Draft PEIS. Further, as described in detail below, to ensure that BLM follows its obligations under the Endangered Species Act and the BLM Special Status Species Manual, the agency may want to consider revising the boundaries of the SESAs to avoid impacts to occupied Gunnison's prairie dog colonies and areas that may contribute to Gunnison's prairie dog recovery.

I. Special Management Areas – Sangre de Cristo National Heritage Area[1]

The Notice of Availability identified a number of different types of special management areas where utility-scale solar development is not appropriate. National Heritage Areas are governed by laws requiring management for protection, enhancement, and interpretation of the natural, cultural, historic, scenic, and recreational resources of the Heritage Area. Legislation was passed in March of 2009 designating Conejos, Costilla and Alamosa counties as the Sangre de Cristo National Heritage Area (NHA). This area also includes the Los Caminos Antiguos scenic by-way.

The mission of the Sangre de Cristo NHA is to promote, preserve, protect and interpret the profound historical, religious, environmental, geographic, geologic, cultural and linguistic resources of the area. These efforts will contribute to the overall national story, engender a spirit of pride and self-reliance, and create a legacy in the Colorado counties of Alamosa, Conejos, and Costilla.

The geologic resources found in the NHA are directly associated with human habitation. The layered water systems first brought in game that attracted many Native tribes to the area, going back 12,000 years. Hispanic settlers from the south were enticed by the water to raise crops and sheep. This area boasts the oldest town in Colorado (San Luis), the oldest parish in Colorado (Our Lady of Guadalupe), and the oldest water rights in Colorado. Anglo ranchers and farmers historically raised cattle and wheat, and today raise crops of alfalfa, potatoes, and lettuce. The geographic isolation of the area has essentially preserved the cultural identity of those groups.

Historically, the SLV area was a crossroads of culture. Mt. Blanca, southeast of the Great Sand Dunes, marks the eastern boundary of the Navajo. Mt. Blanca is considered

[1] Much of the information in this section was gathered by the San Luis Valley Ecosystem Council. It has been edited and included with their permission.

one of four mountain peaks in the four corner area to be sacred among various tribes who inhabited and traded in this area.

Three of the four SESAs are located within the Sangre de Cristo NHA – Four Mile East, Los Mogotes East, and Antonito Southeast. Four Mile East is also bisected by the Scenic by-way route and gateway to the Great Sand Dunes National Park.

Recommendation: BLM should analyze the potential impacts of designating the Four Mile East, Los Mogotes East and Antonito Southeast SESAs and the impacts of potential solar development in those SESAs to the Sangre de Cristo NHA and the Los Caminos Antiguos scenic by-way, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated. BLM should ensure that any SESA designations and subsequent solar development are consistent with the management requirements of the Sangre de Cristo NHA.

II. Biological Resources

a. General habitat issues to be addressed in the Draft PEIS

The San Luis Valley is home to a rich and varied ecosystem. A GIS analysis performed by Center for Native Ecosystems identified overlap with habitat for several species (see Appendix A), as well as overlap with the Colorado Natural Heritage Program Mineral Hot Springs Potential Conservation Area (PCA). Though a larger set of data were used to screen the SESAs (see Appendix B), overlap was only identified in data from the Colorado Division of Wildlife, the Southern Rockies Network Vision, and the Colorado Natural Heritage Program. This overlap is also mapped in Google Earth kmz files (included in the attached CD, Attachment A).

Recommendation: BLM should analyze potential impacts to wildlife habitat and the Colorado Natural Heritage Program Mineral Hot Springs PCA from designating the Colorado SESAs and the impacts of potential solar development in the SESAs, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

b. Overlap with occupied Gunnison's prairie dog colonies and recovery areas

Gunnison's prairie dogs are highly imperiled. Solar energy projects could create major conflicts for prairie dog recovery by destroying and/or fragmenting habitat, introducing perching structures for raptors, creating new roads that allow access for prairie dog shooters and weeds, and adding structures to the landscape that make it more difficult for prairie dogs to detect predators and communicate with other individuals in order to avoid predation.

Montane populations like those of the San Luis Valley (see attached map of Gunnison's prairie dog range, Attachment B) are at particular risk of extinction, and the U.S. Fish and Wildlife Service has determined that these warrant protection under the Endangered

Species Act (73 Fed. Reg. 6660-6684 (Feb. 5, 2008)). This determination places obligations on BLM to reduce or eliminate threats to this species, including solar energy projects, and to promote conservation of this species and minimize the likelihood of listing. To comply with its obligations under the Endangered Species Act and its Special Status Species Manual, BLM should consider revising the SESA boundaries to exclude occupied Gunnison's prairie dog colonies, including a half-mile buffer around colonies, and to exclude likely-to-be-reoccupied habitat that is essential to the recovery of the Gunnison's prairie dog.

In addition, the Colorado Division of Wildlife is in the process of approving a statewide Conservation Strategy for Gunnison's and White-tailed Prairie Dogs, and is also developing Individual Population Area Action Plans. BLM should also ensure that its actions are consistent with these Gunnison's prairie dog recovery efforts. Appendix A includes overlap with occupied Gunnison's prairie dog colonies, and the overlap is also mapped in Google Earth kmz files (included in the attached CD, Attachment A).

Recommendations: To ensure that BLM follows its obligations under the Endangered Species Act and its Special Status Species Manual, the agency should ensure that solar projects on public lands do not pose a threat to this species or increase the necessity of listing Gunnison's prairie dogs under the Endangered Species Act. To ensure compliance with these obligations, BLM should consider revising the SESA boundaries to exclude occupied Gunnison's prairie dog colonies, including a half-mile buffer around colonies, and to exclude likely-to-be-reoccupied habitat that is essential to the recovery of the Gunnison's prairie dog. BLM should also analyze the potential impacts to Gunnison's prairie dogs of designating the SESAs and the impacts of potential solar development in the SESAs, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Josh Pollock, Conservation Director
Center for Native Ecosystems
1536 Wynkoop St, Ste 303
Denver, CO 80202

Carrie Curtiss, Program Director
Colorado Environmental Coalition
1536 Wynkoop St., Ste. 5C

Denver, CO 80202

Tom Darin, Staff Attorney, Energy Transmission
Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

Appendix A – Overlap with Species Habitat

Note: overlap with Gunnison's prairie dog colonies highlighted.

Study Area	Conservation Type	Acres of Conflict
Antonito Southeast	Pronghorn overall range	9,591
	Pronghorn winter range	9,591
	Elk Severe Winter Range	5,442
	Elk Overall Range	9,591
	Elk Winter Range	5,442
	Black Bear Overall Range	9,591
	Bald Eagle Winter Range	9,592
	Bald Eagle Winter Forage	9,575
	Gunnison's Prairie Dog Overall Range	9,591
	Gunnison's Prairie Dog Colonies	9
	Southern Rockies Network Vison - Wildlife Linkage	9,560
	Southern Rockies Network Vison - Medium Use Compatible	27
	Mountain Lion Overall Range	9,591
	Mule Deer Overall Range	9,591
DeTilla Gulch	Pronghorn overall range	1,520
	Pronghorn Perennial Water	22
	Pronghorn Winter Range	1,520
	Pronghorn Winter Concentration	608
	Elk Winter Range	497
	Elk Severe Winter Range	497
	Elk Overall Range	1,520
	Black Bear Overall Range	1,520
	Bald Eagle Winter Range	747
	Gunnison's Prairie Dog Overall Range	1,520
	Gunnison's Prairie Dog Colonies	352

	Southern Rockies Network Vison - Medium Use Compatible	1,518
	CNHP PCA - Mineral Hot Springs	1,026
	Mountain Lion Overall Range	1,520
	Mule Deer Overall Range	1,520
	Mule Deer Winter Range	1,127
Fourmile East	Elk Overall Range	3,878
	Elk Summer Range	213
	Pronghorn overall range	3,878
	Pronghorn winter range	3,878
	Elk Highway Crossings	6
	Black Bear Overall Range	3,878
	Bald Eagle Winter Range	3,878
	Gunnison's Prairie Dog Overall Range	3,878
	Gunnison's Prairie Dog Colonies	1,016
	Southern Rockies Network Vison - Low Use Compatible	3,840
	Mountain Lion Overall Range	3,878
	Mule Deer Overall Range	3,878
Los Mogotes East	Pronghorn overall range	5,905
	Pronghorn Winter Range	5,905
	Pronghorn Perennial Water	26
	Pronghorn Winter Concentration	3,142
	Pronghorn Severe Winter Range	5,693
	Elk Severe Winter Range	5,905
	Elk Winter Range	5,905
	Elk Overall Range	5,905
	Black Bear Overall Range	5,905
	Bald Eagle Winter Range	5,905
	Gunnison's Prairie Dog Overall Range	5,905
	Gunnison's Prairie Dog Colonies	518
	Southern Rockies Network Vison - Low Use Compatible	5,737
	Mountain Lion Overall Range	5,905
	Mule Deer Overall Range	5,905
	Mule Deer Winter Range	134

Appendix B – Entire List of GIS Data Used to Screen SESAs

Full Colorado CNE Screen List	**Source**
BLM Designated ACEC's	BLM
Citizens Proposed Wilderness	SRCA

Colorado Natural Heratage Program (CNHP) Element Occurrances	CNHP
CNHP Potential Conservaiton Areas	CNHP
CNHP Networks of Conservation Areas	CNHP
Colorado Natural Areas Program (CNAP) Natural Areas	CNAP
Colorado State Wildlife Areas (CDOW)	CDOW
USFS Roadless Areas	USFS
USFS Research Natural Areas (RNA)	USFS
Proposed Research Natural Areas (CNAP)	CNAP
Heart of the West Wildlands Network Design	Wild Utah Project
Potential RNA Pike-San Isabel NF and Commanche-Cimmeron NG	USFS
SRCA inventoried Roadless Areas	SRCA
TNC Southern Rocky Mountains Ecoregional Plan Portfolio	TNC
Southern Rockies Ecosystem Project (SREP) Southern Rockies Wildlands Network Design	CNE
SREP Wildlife Linkages	CNE
Dudly Bluffs rare wildflowers	unknown
Susans's Purse-making Caddisfly	unknown
BALD EAGLE-active nestsites	CDOW
BALD EAGLE-communal roost	CDOW
BALD EAGLE-inactive nestsite	CDOW
BALD EAGLE-roost sites	CDOW
BALD EAGLE-unknown nestsites	CDOW
BALD EAGLE-winter concentration	CDOW
CST GROUSE-winter range	CDOW
CST GROUSE-overall range	CDOW
Columbian sharp tailed grouse production area	CDOW
CST GROUSE-production area	CDOW
Comanche mtn plover nest survey	unknown
greater prairie chicken production area	CDOW
greater prairie chicken overall range	CDOW
greater prairie chicken historic range	CDOW
CDOW greater sage-grouse leks	CDOW
greater sage grouse winter range	CDOW
greater sage grouse severe winter	CDOW
greater sage grouse brood area	CDOW
greater sage grouse brood area	CDOW
greater sage grouse production area	CDOW
greater sage grouse production area	CDOW
CDOW potential greater sage grouse core areas	CDOW
greater sage grouse leks 4 mile buffer TWS	CDOW
gunnison sage grouse winter range	CDOW
gunnison sage grouse severe winter	CDOW
gunnison sage grouse production area	CDOW

gunnison sage grouse overall range	CDOW
gunnison sage grouse historic habitat	CDOW
gunnison sage grouse brood area	CDOW
gunnison sage grouse habitat status	CDOW
Commanche lesser prairie chicken leks	CDOW
lesser prairie chicken special management area	CDOW
lesser prairie chicken production area	CDOW
lesser prairie chicken overall range	CDOW
lesser prairie chicken historic range	CDOW
least tern production area	CDOW
least tern foraging area	CDOW
plains sharp tailed grouse production area	CDOW
plains sharp tailed grouse winter range	CDOW
plains sharp tailed grouse overall range	CDOW
piping plover production area	CDOW
piping plover foraging area	CDOW
mexican spotted owl FS protected activity centers	CDOW
mexican spotted owl FS survey	CDOW
mexican spotted owl proposed critical habitat	FWS
mexican spotted owl designated critical habitat	FWS
mexican spotted owl protected activity centers	FWS
bonytail chub designated critical habitat	FWS
colorado pikeminnow designated critical habitat	FWS
razorback sucker designated critical habitat	FWS
humpback chub designated critical habitat	FWS
CO river cutthroat watersheds	CDOW
CO River cutthroat Trout habitat	CDOW
greenback cutthroat watersheds	CDOW
rio grande cutthroat watersheds	CDOW
TX horned lizard overall range	CDOW
BToad CurrentRange	CDOW
boreal toad CNHP eors 02 2002	CNHP
boreal toad breeding sites	CDOW
boreal toad observations	CDOW
boreal toad potential translocation sites	CDOW
boreal toad surveying	CDOW
KIT FOX-overall range	CDOW
CDOW LYNX potential habitat	CDOW
BLM & FS lynx linkages	USFS & BLM
BLM & FS lynx analysis units	USFS & BLM
FS NE Lynx habitat	USFS
FS SW lynx habitat	USFS
potential douglas county pocket gopher habitat 1990	Douglas County
potential douglas county pocket gopher habitat 2003	Douglas County
prarie dog all layers combined	CDOW

prebles m. j. mouse critical habitat	FWS
prebles m. j. mouse critical habitat stream names	FWS
prebles m. j. mouse occupied range	FWS
prebles m.j. mouse trapping survey points 2004	FWS
swift fox overall range	CDOW
Astragalus debequaeus-Iliamna grandiflora-Lomatium concinnum-Oenothera acutissima-Oxytropis besseyi var abnapiformis-Penstemon gibbensii	unknown
Cirsium perplexans BLM	BLM
Mentzelia rhizomata BLM	BLM
Penstemon debilis	unknown
Penstemon grahmii proposed critical habitat	FWS
Porter feathergrass	unknown
eriogonum pelinophilum	unknown
AbertsSquirrelOverallRange	CDOW
BighornMigrationPatterns	CDOW
BighornMigrationCorridors	CDOW
BighornMineralLick	CDOW
BighornOverallRange	CDOW
BighornProductionArea	CDOW
BighornSevereWinterRange	CDOW
ElkMigrationPatterns	CDOW
MooseMigrationPatterns	CDOW
MuleDeerMigrationPatterns	CDOW
PronghornMigrationPatterns	CDOW
BighornSummerConcentrationArea	CDOW
BighornSummerRange	CDOW
BighornWaterSource	CDOW
BighornWinterConcentrationArea	CDOW
BighornWinterRange	CDOW
BlackBearFallConcentration	CDOW
BlackBearHumanConflictArea	CDOW
BlackBearOverallRange	CDOW
BlackBearSummerConcentration	CDOW
BTPrairieDogOverallRange	CDOW
BWQuailConcentrationArea	CDOW
BWQuailOverallRange	CDOW
ElkHighwayCrossings	CDOW
ElkLimitedUseArea	CDOW
ElkMigrationCorridors	CDOW
ElkOverallRange	CDOW
ElkProductionArea	CDOW
ElkResidentPopulationArea	CDOW
ElkSevereWinterRange	CDOW
ElkSummerConcentrationArea	CDOW

ElkSummerRange	CDOW
ElkWinterConcentrationArea	CDOW
ElkWinterRange	CDOW
GBHeronForagingArea	CDOW
GBHeronHistoricNestArea	CDOW
GBHeronNestingArea	CDOW
GeeseBroodConcentrationArea	CDOW
GeeseForagingArea	CDOW
GeeseMoltingArea	CDOW
GeeseProductionArea	CDOW
GeeseWinterConcentrationArea	CDOW
GeeseWinterRange	CDOW
MassasaugaOverallRange	CDOW
MooseConcentrationArea	CDOW
MooseOverallRange	CDOW
MoosePriorityHabitat	CDOW
MooseSummerRange	CDOW
MooseWinterRange	CDOW
MtnGoatConcentrationArea	CDOW
MtnGoatMigrationCorridors	CDOW
MtnGoatMineralLick	CDOW
MtnGoatOverallRange	CDOW
MtnGoatProductionArea	CDOW
MtnGoatSummerRange	CDOW
MtnGoatWinterRange	CDOW
MtnLionHumanConflictArea	CDOW
MtnLionOverallRange	CDOW
MtnLionPeripheralRange	CDOW
MuleDeerConcentrationArea	CDOW
MuleDeerCriticalWinterRange	CDOW
MuleDeerHighwayCrossing	CDOW
MuleDeerLimitedUseArea	CDOW
MuleDeerMigrationCorridors	CDOW
MuleDeerOverallRange	CDOW
MuleDeerResidentPopulationArea	CDOW
MuleDeerSevereWinterRange	CDOW
MuleDeerSummerRange	CDOW
MuleDeerWinterConcentrationArea	CDOW
MuleDeerWinterRange	CDOW
OspreyForagingArea	CDOW
OspreyNestsites	CDOW
PeregrineMigratoryHuntingHab	CDOW
PeregrineNestingArea	CDOW
PeregrinePotentialNesting	CDOW
PheasantConcentrationArea	CDOW

PheasantOverallRange	CDOW
PipingPloverForagingArea	CDOW
PipingPloverProductionArea	CDOW
PronghornLimitedUseArea	CDOW
PronghornConcentrationArea	CDOW
PronghornMigrationCorridors	CDOW
PronghornOverallRange	CDOW
PronghornPerennialWater	CDOW
PronghornResidentPopulationArea	CDOW
PronghornSevereWinterRange	CDOW
PronghornWinterConcentration	CDOW
PronghornWinterRange	CDOW
PtarmiganOverallRange	CDOW
PtarmiganOverallRange	CDOW
RiverOtterConcentrationArea	CDOW
RiverOtterNatalDen	CDOW
RiverOtterOverallRange	CDOW
RiverOtterWinterRange	CDOW
ScaledQuailOverallRange	CDOW
THLizardOverallRange	CDOW
TurkeyOverallRange	CDOW
TurkeyProductionArea	CDOW
TurkeyRoostSites	CDOW
TurkeyWinterConcentrationArea	CDOW
TurkeyWinterRange	CDOW
WhPelicanForagingArea	CDOW
WhPelicanNestingArea	CDOW
WhPelicanOverallRange	CDOW
WTDeerConcentrationArea	CDOW
WTDeerHighwayCrossing	CDOW
WTDeerOverallRange	CDOW
WTDeerWinterRange	CDOW
Miscellaneous	COMaP Version 7

Exhibit 9: Site-specific Comments on Solar Energy Study Areas – Nevada

These comments are a subset of the comments prepared by the Nevada Wilderness Project and are included with their permission.

Please accept and fully consider these comments, submitted on behalf of the following groups: The Wilderness Society, Western Resource Advocates, and the Wild Utah Project.

In this section, we provide information about conservation concerns that we have identified for each of the SESAs. We also provide suggestions for how some of the SESAs might be improved and ways that impacts on the ground might be lessened or addressed with further research into the on-the-ground conditions at the SESA. We have organized these by Field Office.

Briefly, NWP filtered the sites against available biological data including Nevada Natural Heritage Program (NNHP) data, Nevada Department of Wildlife (NDOW) data, and data from other conservation groups using a Geographic Information System. The biological information from this filtering process provides valuable baseline information for each SESA and is useful in identifying potential wildlife conflicts. Only species that have some conservation concern within the state (e.g., NDOW species of concern or species where limited information is available on their overall state). NWP also examined SESAs against a composite model of species diversity for Nevada that we produced using Southwest Regional GAP Analysis Project 30-m wildlife habitat models. This model included all models available for profiled species in Nevada's Wildlife Action Plan and species that were in the NNHP dataset but not in the Wildlife Action Plan. Overall, 96 species were used after removing several problematic species or models (e.g., no bat species were included as their habitat models were too general to be informative). This will be referred to as the biodiversity model below.

Overall, the SESAs appear to have been chosen well, and, notwithstanding the issues raised and boundary revision recommendations outlined below, should be included in the Draft PEIS for detailed analysis and consideration for designation.

Battle Mountain Field Office

Gold Point: There were no records in the NNHP dataset. The long-nosed leopard lizard was listed in the NDOW data. Overall, there are very few apparent conflicts from the data. The biodiversity model shows low overall diversity for the site relative to other study areas.

Millers: There were no NNHP records, but desert horned lizard and long-nosed leopard lizard are present from NDOW data. This solar study area lies north of Hwy 6/95 and northwest of the Miller's rest stop, an important bird migration stop and birding location; consideration of possible impacts on migratory birds should be included. The Big Smoky Valley is heavily impacted with roads and mineral exploration throughout this area making this a site that has already sustained a fair amount of developmental impacts. The northeast portion is comprised of stabilized dunes, habitat rich in small mammal diversity and worth trying to avoid due to the preponderance of important vertebrate and invertebrate species often found in these sites (e.g., pallid kangaroo mice, desert kangaroo rat, dune beetles, etc.). Although there are no records present in the available datasets, this is likely an unstudied area that would benefit from investigation. NWP recommends that the stabilized sand dunes be explicitly excluded from the Millers SESA.

Ely Field Office

Dry Lake Valley North: Eastwood milkweed appears in the NNHP dataset for the area and should be excluded. The dark kangaroo mouse, desert horned lizard and burrowing owl are present based on the NDOW data. Burrowing owl colonies and dark kangaroo mice areas should also be excluded. We can assist in defining these exclusions by providing maps under separate cover. Overall, this site has numerous roads and a relatively high incidence of annual grass invasion along the east based on modeling of annual grasses for Nevada by NNHP. The prevalence of several rare or important species warrants careful monitoring of impacts from development.

East Mormon Mountain: A small population of Las Vegas buckwheat has been identified at this site, and measures to avoid this species should be made. A model of desert tortoise habitat indicates that this area is good habitat for the species. Recent fires to the north and west of the SESA might be worth consideration for development if site suitability for solar exists. It might be possible to adjust the site so desert tortoise habitat that has not already burned is removed and replaced with areas that are burned. Additionally, The Nature Conservancy's "Meadow Valley Wash - Muddy River - Mormon Mesa" priority landscape. Transmission already exists at the site, so it could provide utility-scale solar to the grid with minimal development of transmission.

Delamar Valley: There are no obvious conflicts from the available data. The site is placed along the planned SWIP corridor, so transmission has to be developed before the site can be available for solar development. Much of the SESA is on a dry lakebed. It should be noted that bighorn migration corridors to the south between the Desert Refuge and the Delamar and Meadow Valley Ranges may be negatively affected by future transmission development associated with this site. NWP would like to work with NDOW, USFWS, the BLM and other appropriate agencies to ensure landscape permeability for bighorn sheep as transmission development proceeds.

Dry Lake: This SESA has desert tortoise and rosy two-tone beardtongue from the NNHP data. Several intersections occur with NDOW mapped movement corridors for desert bighorn sheep, but wildlife corridors are supposed to be excluded in SESA designation. Adjustments should be made to exclude those corridors. The NDOW data shows the presence of the banded Gila monster, common chuckwalla, desert banded gecko, desert horned lizard, desert night lizard, LeConte's thrasher, long-nosed leopard lizard, sage sparrow and western banded gecko. The proximity to Las Vegas, and existing transmission development in the area make this one of the more heavily inventoried SESAs in Nevada; it also makes this an area that has seen impacts from exurban activities that are damaging to the quality of wildlife habitats (an example of cumulative impacts). Because rocky outcrops are high-quality habitat for many of the lizard species of conservation concern and because solar energy construction may require the removal these large boulders, NWP recommends the BLM explicitly exclude rock outcrops from the SESA. The area also shows high biodiversity potential, typical of much of the Mojave Desert. Because of the many species showing up in the southern portion of this SESA, it would seem more feasible to limit the site to the northern portion of the current SESA. A preferred alternative SESA is depicted below where the northern portion is kept and the SESA is extended to the east following I-15 and the Moapa Valley Indian Reservation, shown as black cross-hatching in the image. This configuration would avoid bighorn movement corridors and not press up against bighorn habitat in the Arrow Canyon Range. Additionally, some of the more sensitive species found in the south

of the current SESA are excluded. The alternative SESA is approximately 13,500 acres (see Figure 1).

Amargosa Valley: Desert tortoise (NNHP), desert horned lizard, desert iguana and long-nosed leopard lizard (NDOW) are recorded on the site. The SESA is well outside of the buffer zone established by the Nevada State Water Engineer to protect the endangered Devil's Hole pupfish, although there is still considerable controversy over the biological meaning of that buffer. There are several disturbances on-site, including a railway grade and roads that bisect the site making it a relatively fragmented area. There are no other identifiable conflicts from our filtering, and the site shows only moderate biodiversity in the biodiversity model.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Tom Darin, Staff Attorney, Energy Transmission
Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

.

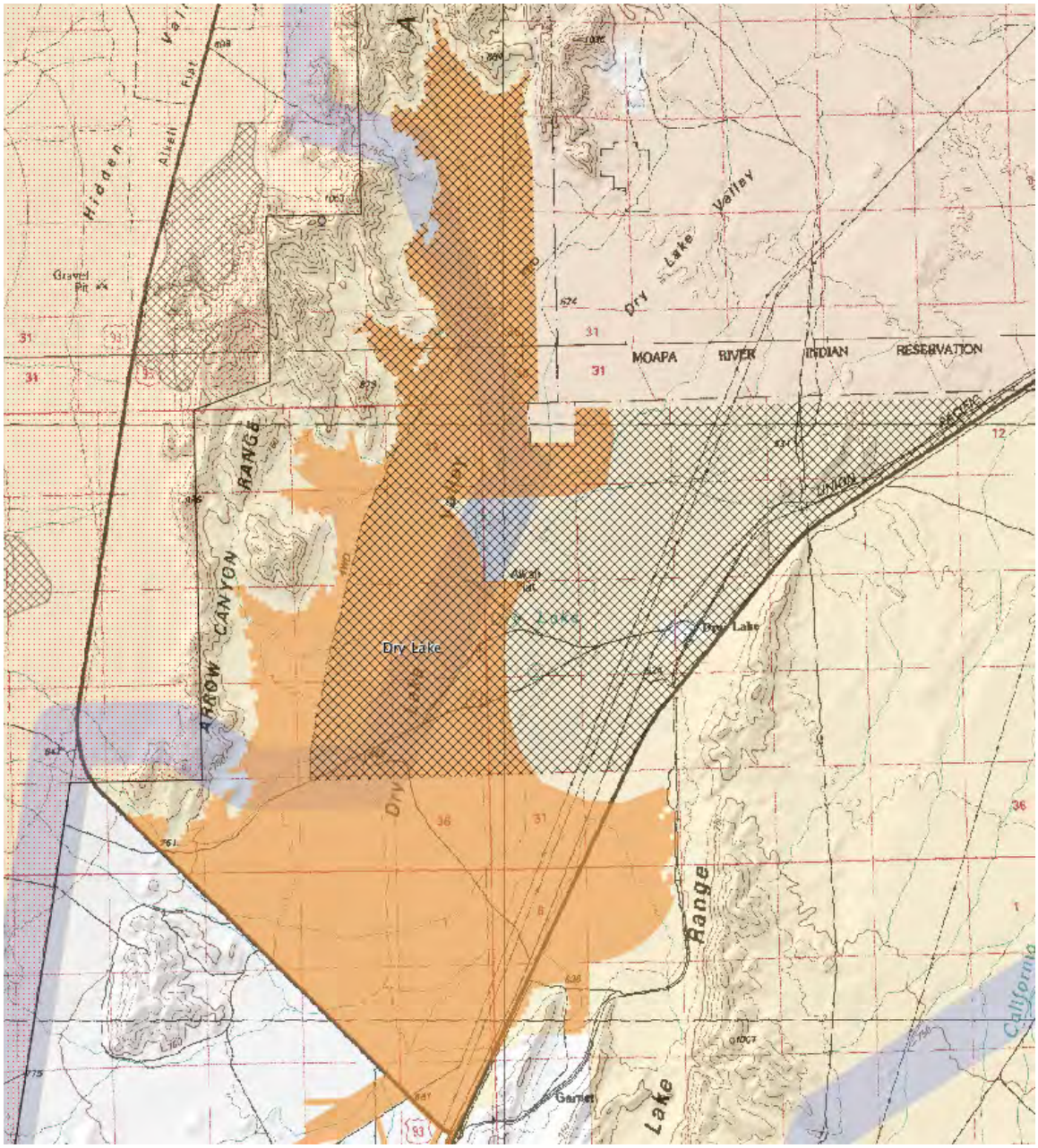


Figure 1. Dry Lake proposed alternative Solar Energy Study Area, Nevada. Cross-hatched area represents the NWP proposed SESA.

Exhibit 10: Site-specific Comments on Solar Energy Study Areas – New Mexico[1]

Please accept and fully consider these comments, submitted on behalf of the following groups: The Wilderness Society, Western Resource Advocates, and Wild Utah Project.

A positive aspect of the three New Mexico Solar Energy Study Areas (SESAs) is that they are all located near existing infrastructure, and thus would require less new road building than if they were located more remotely. The Afton SESA may need boundary adjustments to avoid important reptile habitat, but overall appears to contain the least amount of potential conflicts with natural and cultural resources and should be included for detailed analysis in the Draft PEIS.

The Mason Draw and Red Sand SESAs have significantly more conflicts. Though the BLM Las Cruces field office originally identified the Mason Draw and Red Sand SESAs as potentially appropriate areas for solar development, the field office has undertaken subsequent, more detailed review and identified unacceptable conflicts. Because of these conflicts with natural and cultural resources and wildlife management areas, the field office has sent a letter to BLM Washington Office recommending that both the Mason Draw and Red Sand SESAs be dropped from consideration. It is clear that much potential for conflict exists in these areas, and BLM will need to study these areas in detail to determine whether they are appropriate for inclusion as SESAs.

In addition to consultation with BLM and others, these comments are informed by a GIS analysis. This analysis screened the SESAs with the following data layers:

1. Designated Critical Habitats for species protected as Threatened and Endangered under the Endangered Species Act
2. BLM ACECs and Special Management Areas
3. TNC Ecoregional portfolios
4. NM Highlands Wildlands Network SITES analysis
5. New Mexico Wilderness Alliance BLM Inventory Units
6. USGS Southwest ReGAP: overall species richness, and by taxonomic group

Mason Draw SESA

- This SESA intersects southwestern corner of New Mexico Wilderness Alliance (NMWA) BLM Citizens' Wilderness Inventory Unit "Sleeping Lady Hills" by approx. 350 acres and also clips the "Robledos-Las Uvas" unit by approx. 480 acres (see Figure 1; GIS data for the NMWA Citizens' Wilderness Inventory Units included in Exhibit 2 of broad comments submitted under the same cover as these New Mexico-specific comments). This overlap is unacceptable and unnecessary – the Mason Draw SESA should, at a minimum, be redrawn to exclude these inventory areas.

[1] Much of this information was gathered by Defenders of Wildlife. It has been edited and included with their permission.

The NMWA inventory of the area found that the Robledos-Las Uvas complex contains a wide variety of biological, archaeological and historic resources. Given its close proximity to this roadless area complex, it is likely that the Mason Draw solar energy study area shares many of these characteristics and values.

The Robledos-Las Uvas complex contains a high diversity of vegetation types, especially cacti (including the State-endangered night-blooming cereus). Pronghorn, mule deer, mountain lion, bobcat, coyote, bats, rock squirrels and other rodents, quail, and numerous other birds also call this area home. The grasslands found here are important to a declining grassland fauna and provide habitat for rare birds like the Aplomado falcon and Baird's sparrow. The abundance of cliffs in the mountains provides nesting and perching sites for many raptors, including bald and golden eagles, various hawks and owls, and the Federal-endangered peregrine falcon. Reptile diversity is also high; banded rock rattlers, Madrean alligator lizards, and Trans-Pecos rat snakes are all found here, as are other reptiles that reach the northern or western limits of their range.

Archaeological and historic resources are also rich in the Greater Robledo Mountains – Sierra de las Uvas Complex. At least 20 historic and prehistoric sites are known to occur within or adjacent to the Robledo Mountains Wilderness Study Area, including some of the earliest known prehistoric habitation sites in southern New Mexico. Also included are several undisturbed pothouse villages, two Lithic Indian sites in Horse Canyon, and at least two excellent petroglyph sites in the Sierra de las Uvas. More prehistoric sites likely exist, but no comprehensive survey has taken place. The historic Butterfield Trail also runs through the area.

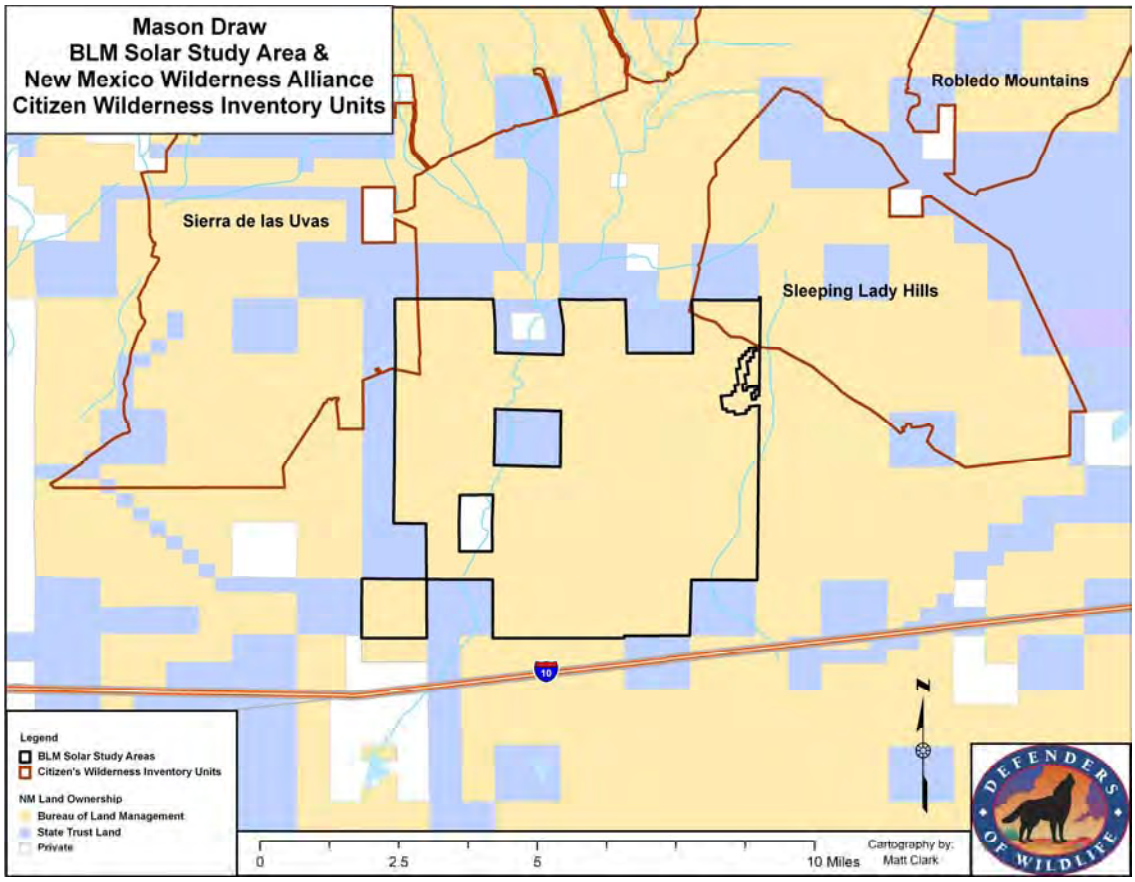


Figure 1. This map depicts overlap and conflict of the Mason Draw SESA with the New Mexico Wilderness Alliance's BLM Citizen's Wilderness Inventory Units.

Additional considerations:

- This SESA is located within a BLM Habitat Management Planning area for pronghorn and mule deer (see Figure 2). Industrial solar development is not consistent with maintaining and/or improving habitat for these two species, both of which are very sensitive to roads, traffic, human development and disturbance.
- The Nature Conservancy (TNC), in cooperation with the BLM and other entities, conducted a Rangeland Ecological Assessment (REA) for the southern half of New Mexico. In this assessment, there are two areas totaling approximately 1,000 acres in the west and south of the Mason Draw SESA mapped as "unresolved",that may contain some grassland reference condition elements[2].

[2] See p. 35 of the Rangeland Ecological Assessment
http://nmconservation.org/projects/rangeland_ecological_assessment/

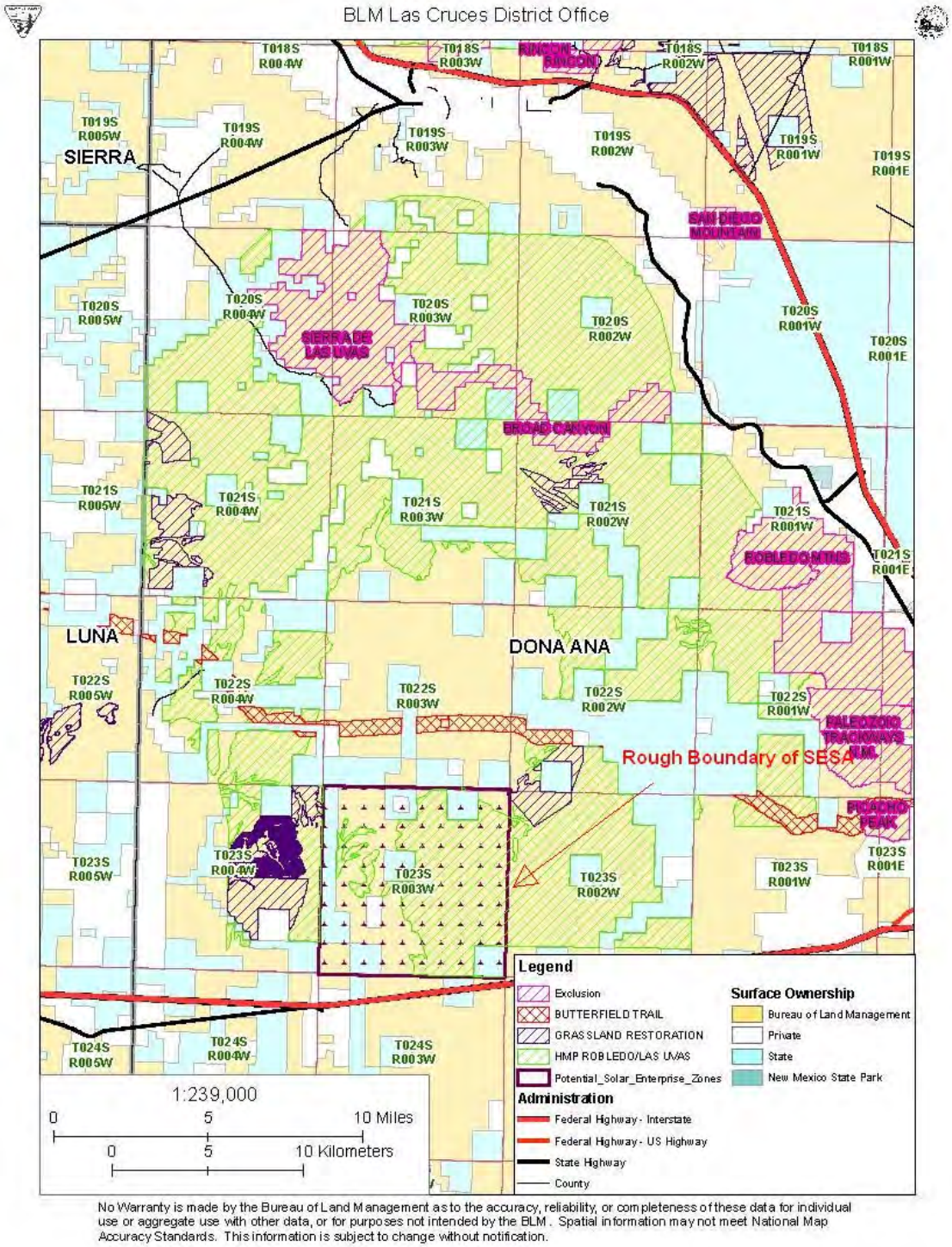


Figure 2. This map depicts overlap and conflict of the Mason Draw SESA with the BLM Habitat Management Planning Area for pronghorn and mule deer.

Recommendations: At the very least, BLM should revise the boundary of the Mason Draw SESA to exclude the overlap with the NMWA Citizens' Wilderness Inventory Units. Based on potential resource conflicts and issues raised by the BLM Las Cruces

District Office regarding overlap with the BLM Habitat Management Planning area for pronghorn and mule deer, as well as the additional issues raised above, BLM should carefully analyze this area and determine whether all or part of it is appropriate for inclusion as a SESA. If it is included, BLM should analyze the potential impacts of designating the SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

Red Sand

- TNC's Rangeland Ecological Assessment identifies a grassland area in the northwestern portion of this SESA that contains approximately 6,400 acres of reference condition-quality grasslands (See Figure 3). Reference condition Chihuahuan desert grasslands are very rare, and BLM should carefully consider whether they are appropriate for inclusion in the SESA.

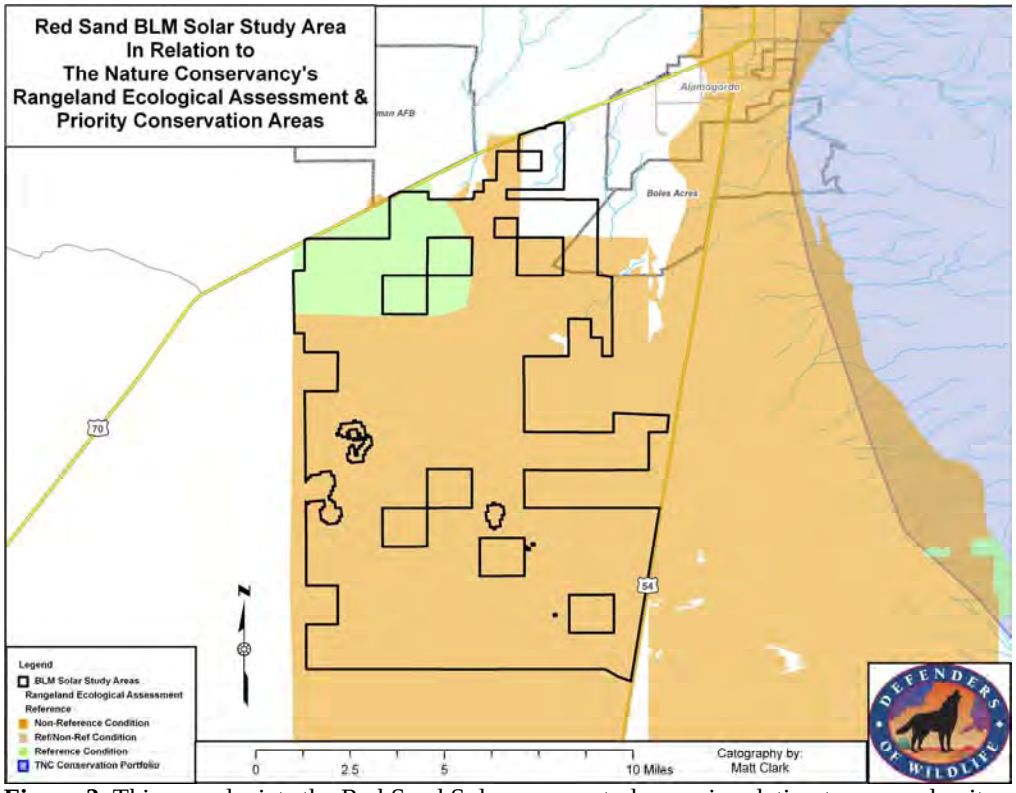


Figure 3. This map depicts the Red Sand Solar energy study area in relation to mapped units of TNC's Rangeland Ecological Assessment reference conditions.

- The BLM Renewable Resources division is currently developing habitat restoration projects in this SESA. To the extent that lands within this SESA are targeted by BLM and conservation organizations for grassland restoration, BLM should carefully consider whether these areas should included in theSESA. Figure 4 shows TNC's REA mapped restoration potential.
- This SESA contains several playa lakes, which provide seasonally important habitat and water sources for migrating birds and other wildlife species (See Figure 5).

- According to the Las Cruces BLM Field Office[3], this SESA contains extensive cultural resources that would potentially be disrupted by industrial-scale solar development.

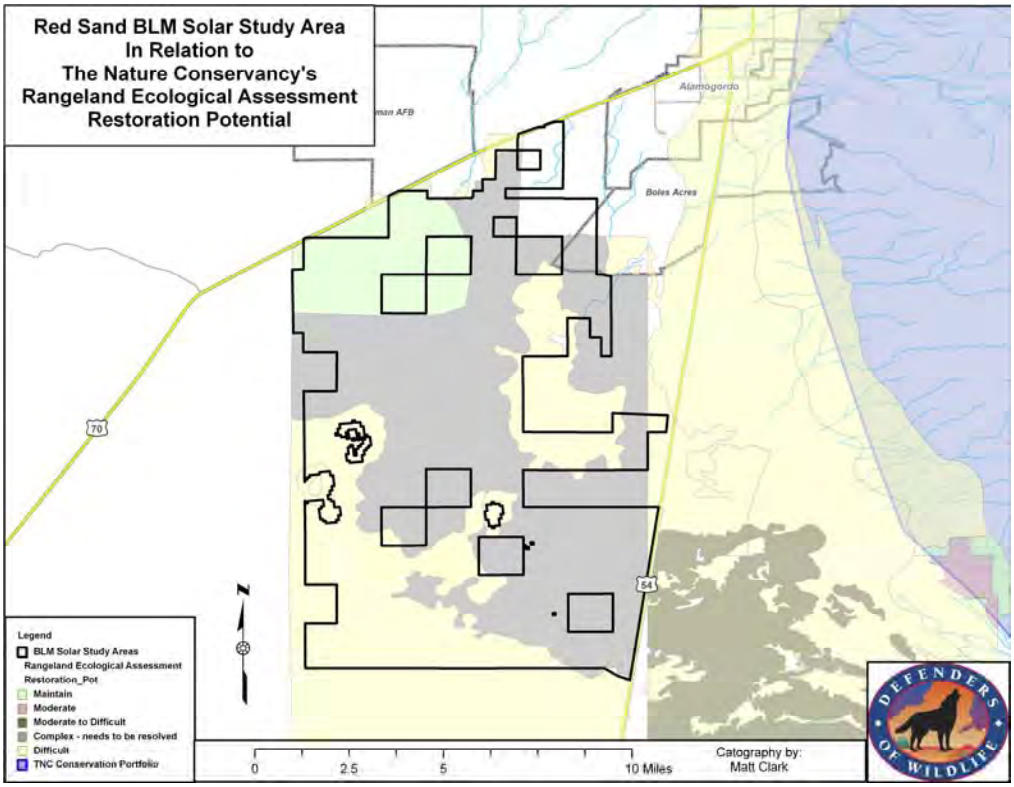


Figure 4. This map depicts the Red Sand Solar energy study area in relation to TNC's Rangeland Ecological Assessment restoration potential.

[3] Personal communication with BLM Las Cruces District Office staff.

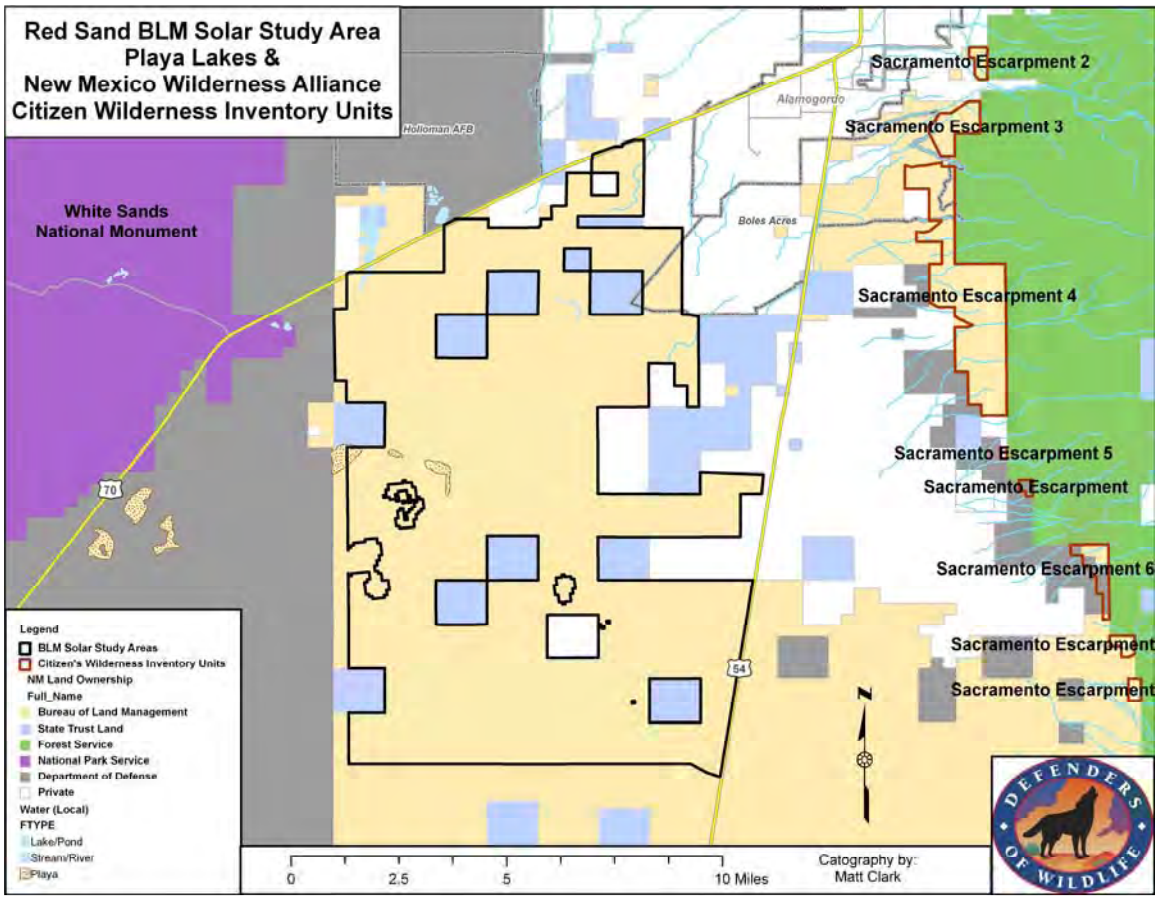


Figure 5. This map depicts the Red Sand SESA in relation to NMWA Citizens' Wilderness Inventory Units and playa lakes.

Recommendations: Based on conflicts identified by the BLM Las Cruces District Office and our own analysis, including the presence of playa lakes within the site, the extensive nature of the cultural resources, the development of habitat restoration projects underway in BLM's Renewable Resources division, and the presence of reference condition-quality grasslands as mapped by TNC, BLM should carefully consider whether or not to include all or some part of this area as a SESA. If the SESA is included, BLM should analyze the potential impacts of designating the SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

Afton

- Of the three SESAs in New Mexico, this unit appears to have the least conflict with sensitive natural resources. It is also close to existing infrastructure (Interstate 10 and an "existing designated corridor") as well as a major metropolitan area (Las Cruces).
- According to USGS Southwest ReGAP terrestrial species predicted range modeling species richness composite, this SESA has high reptilian diversity in the eastern half (45 on a scale of 0-57) (See Figure 6).

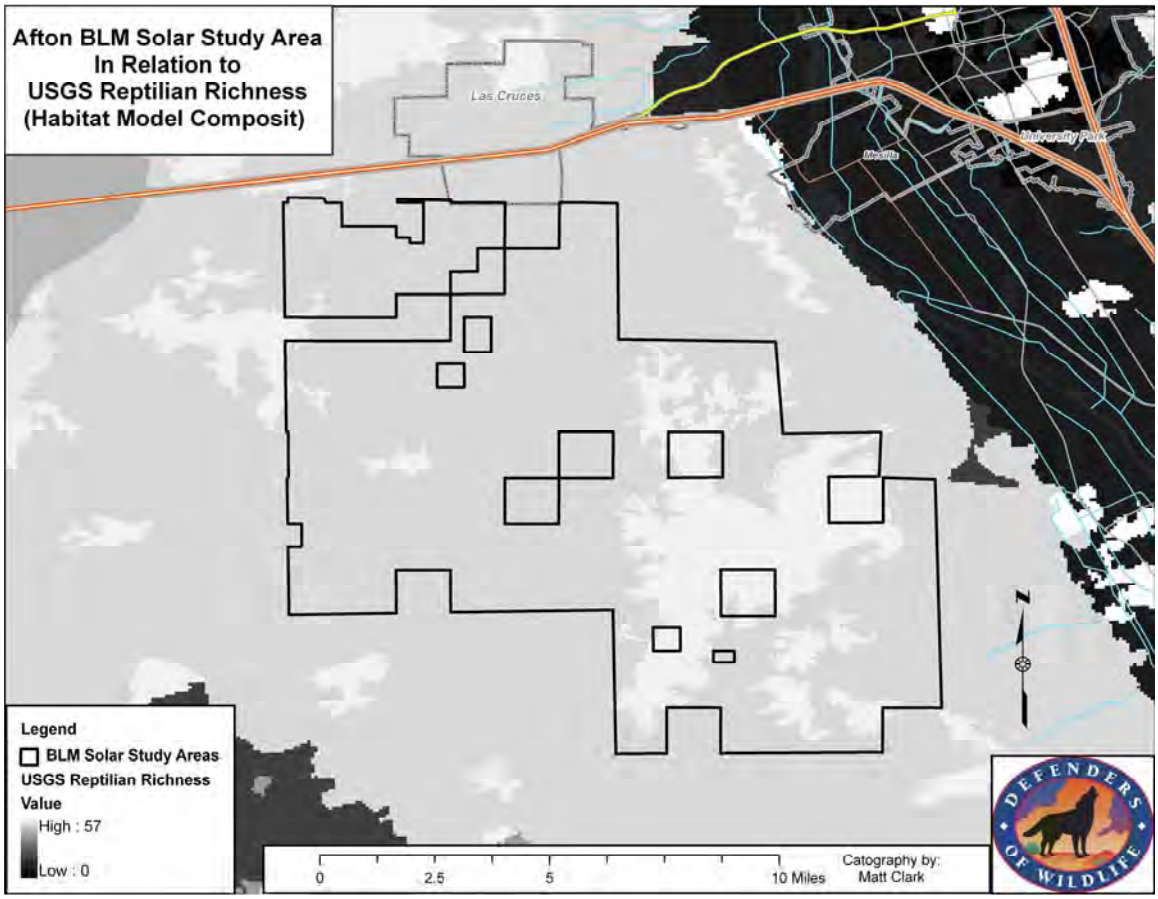


Figure 6. This map depicts the Afton Solar Energy Study Area in relation to the USGS Southwest ReGAP wildlife habitat modeling reptile richness composite. Note the area in the eastern portion of the study area that contains relatively high reptilian richness.

Recommendations: Because it represents the SESA with the least amount of conflict in New Mexico, BLM should study the Afton SESA in detail in the Draft PEIS to determine whether the area is appropriate for solar development. BLM should also closely analyze areas with high reptilian diversity in the eastern portion of the SESA, and if serious conflicts are found the agency should consider avoiding them for solar development. BLM Las Cruces District Office has indicated that there may be areas adjacent to the Afton SESA which might be appropriate for inclusion in the SESA[4] – BLM should evaluate those areas to determine if they are appropriate for inclusion. BLM should

[4] Teleconference held on August 24, 2009 by BLM officials with environmental advocates.

analyze the potential impacts of designating the SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated. BLM should also analyze the potential impacts of nearby industrial-scale solar development on the scenic and habitat values of the Aden Lava Flow ACEC (see Figure 7 for proximity).

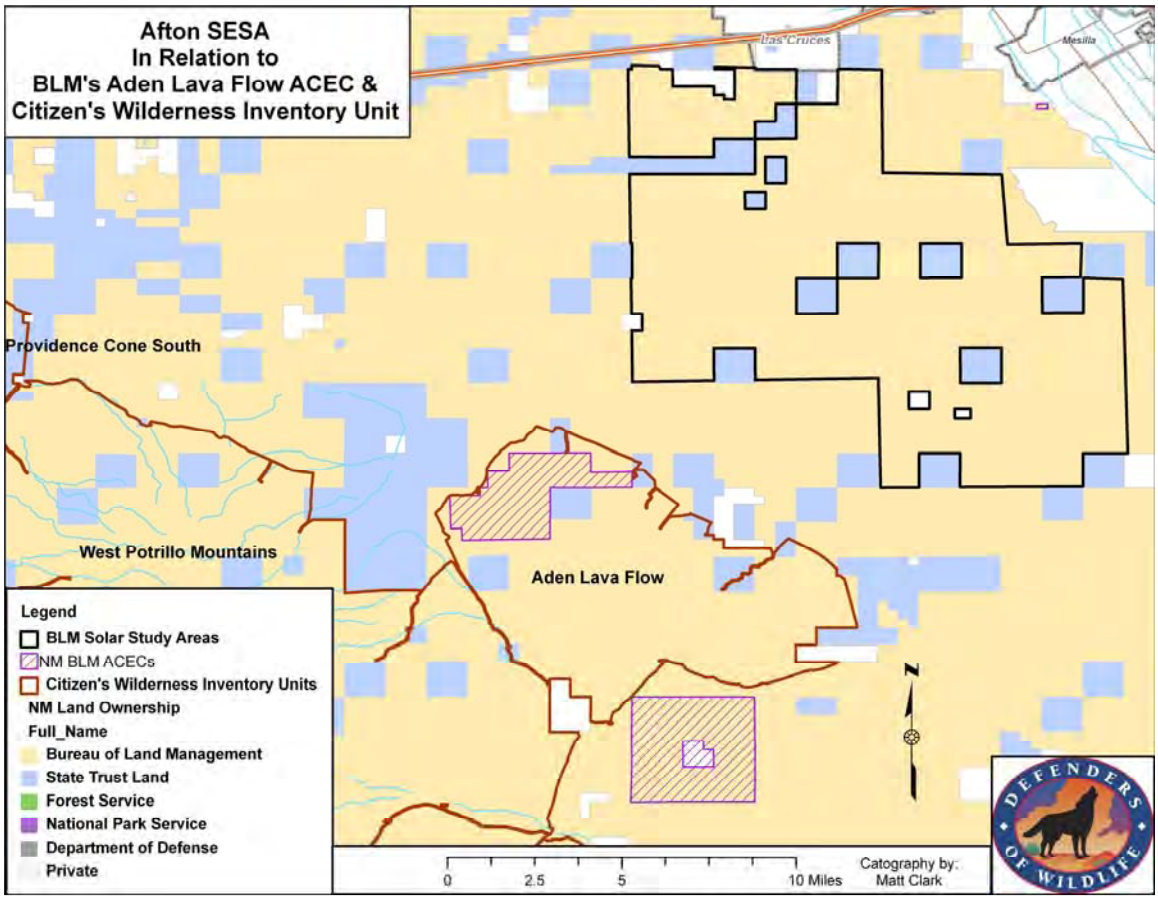


Figure 7. This map shows the close proximity of the Afton SESA to the Aden Lava Flow Area of Critical Environmental Concern.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Tom Darin, Staff Attorney, Energy Transmission

Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

Exhibit 11: Site-specific Comments on Solar Energy Study Areas – Utah

These comments are a compilation of comments prepared by the Southern Utah Wilderness Alliance (SUWA) and the Wild Utah Project (WUP). The comments have been reorganized and edited by The Wilderness Society and are included with the permission of SUWA and WUP. SUWA provided much of the narrative comments. WUP performed a GIS analysis and provided the results of that analysis, as well as narrative descriptions and recommendations based on those results.

Please accept and fully consider these comments, submitted on behalf of the following groups: The Wilderness Society, Californians for Western Wilderness, Southern Utah Wilderness Alliance, Western Resource Advocates, and the Wild Utah Project.

I. Data sources reviewed for GIS analysis

The following data sets were reviewed by WUP in this process of analyzing the areas proposed by the Bureau of Land Management (BLM) as Solar Energy Study Areas (SESAs) in their Programmatic Environmental Impact Statement on solar energy development (PEIS).

1. USGS 1:24,000 scanned images of topographic maps. Data shown on these images cannot be found in other GIS data sets for most of Utah. Marshes, intermittent lakes, and other features can be reviewed on these maps. Georeferenced images from Utah's GIS Portal (AGRC) were downloaded for the quads that cover these sites.
2. Threatened and endangered species locations by quad sheet, Utah Heritage Program. The spatial data set for Utah and federal sensitive species is available on the web on the Utah Division of Wildlife Resources. (The file name used in this analysis is TES 20090608.)
3. Utah Division of Wildlife Resources habitat classifications for wildlife. Those species that UDWR have data for and are relevant to these sites include mule deer, pronghorn antelope, and sage grouse. These data sets were downloaded from UDWR's GIS web site.
4. Utah Division of Wildlife Resource watershed restoration initiative conservation focus areas. (WRI focus Areas 20080324.) This data set identified important sage grouse brooding habitat south of the Milford Flat site.
5. Utah Wilderness Coalition wilderness proposal. Wild Utah Project created and supports this GIS data set.
6. Utah Forest Network wilderness proposal for Utah National Forests. Wild Utah Project created and supports this GIS data set.
7. Spring data, AGRC GIS Portal. The statewide data set for springs was downloaded to identify surface springs and wetland areas that might be in this survey site. The spring data set does not have metadata and most of the points in the area of interest are wells and most of those abandoned. No data on wetlands was found and used in this analysis. The spring data was checked against the USGS quad image to see of on the quad sheet this is identified as wetland or surface springs. None were found in the proposed pilot areas.
8. One BLM RMP was reviewed for relevant information for these sites. The Cedar Beaver Garfield Antimony Resource Management Plan covers the Milford Flat site and the Escalante Valley proposed site. No existing RMP could be found that covers the Wah Wah Valley proposed site.

9. BLM wilderness study areas, areas of critical environmental concern, and designated natural areas. The three proposed areas do not include lands designated in these categories.

II. General results of GIS analysis

Generally speaking, the SESAs have been identified in areas with limited conflicts with wildlife habitat, recreation opportunities, areas identified by citizens and conservation groups as having wilderness qualities, wetlands and riparian areas, and other sensitivities. However, potential for conflict with particular species and values exist in all of the SESAs, and careful analysis through the development of the PEIS will be critical in continuing to refine the SESAs and guide development to the best places.

The Utah Division of Wildlife Resources maintains a list of sensitive species. By rule, wildlife species that are federally listed, candidates for federal listing, or for which a conservation agreement is in place automatically qualify for the *Utah Sensitive Species List.*
Spatial data on the habitat where sensitive species are found is at the resolution of a 1:24,000 scale quad sheet. This means that inside the bounds and quad map (an area approximately 10X13 km in size) the listed species have been observed and their continued existence in this area requires action. The Division web site states "The additional species on the *Utah Sensitive Species List*, 'wildlife species of concern,' are those species for which there is credible scientific evidence to substantiate a threat to continued population viability. It is anticipated that wildlife species of concern designations will identify species for which conservation actions are needed, and that timely and appropriate conservation actions implemented on their behalf will preclude the need to list these species under the provisions of the federal Endangered Species Act."
http://dwrcdc.nr.utah.gov/ucdc/ViewReports/sslist.htm

For each proposed pilot sites, we have listed the sensitive species dependent on habitat in the quad sheet that includes these sites. This information is presented in a table, one for each of the three sites. The third and forth column in each table has this global (G) and state (S) rank:

1= Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences.
2= Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction or extirpation, typically with 6-20 occurrences.
3 = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences.
4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences.
5 = Demonstrably widespread, abundant, and secure.
H = Historical Occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered.
T = subspecies, variety or recognized race.
X = Presumed extirpated or extinct.
U = Unknown rank.
NR = Not yet ranked.

Note that the results presented here come directly from the Division of Wildlife Resources data. Some of the results are not explained by the Division of Wildlife Resources (such as the "B" in S3B for Athene cunicularia and the "?" in S2? for Microdipodops megacephalus) metadata.

III. SESA-specific comments

a. Escalante Valley and Milford Flats South SESAs

i. Support for the inclusion of the Escalante Valley and Milford Flats South SESAs in the Draft PEIS

Though potential conflicts will need to be analyzed and addressed in the Draft PEIS, we support the inclusion of the Escalante Valley and the Milford Flats South proposed Solar Energy Study Areas (SESAs) in the Draft PEIS. These two proposed SESAs are located near existing infrastructure, including existing high-capacity transmission lines (see Wild Utah project map attached as Exhibit A). Locating large-scale renewable energy facilities near existing infrastructure is important because it reduces the necessity for substantial new surface disturbance. Reducing the extent of surface disturbance is important for all the reasons discussed above, including reducing the amount of dust generated.

In addition, construction of solar projects in these two proposed SESAs would benefit the local economies of Beaver, Iron, and Millard counties and provide local jobs. The Milford Flats South SESA is near the town of Milford, which is currently experiencing a boost to its economy from the ongoing construction of the Milford Wind farm, located approximately 10 miles north of Milford, and consisting of nearly 100 wind turbines. Construction of a solar energy facility south of Milford will continue to help the local economy, including the towns of Milford and Minersville. Construction of the Escalante Valley SESA would similarly provide a boost to Beaver and Iron County's economy.

Recommendation: BLM should include the Escalante and Milford Flats South SESAs for detailed analysis in the Draft PEIS. BLM should prioritize analysis of the potential issues raised in sections III a. ii. and III a. iii., below.

ii. Site-specific results of GIS analysis for Escalante Valley SESA

The sensitive species found at the Escalante Valley proposed site include:

Brachylagus idahoensis	Pygmy Rabbit	G4	S2
Athene cunicularia	Burrowing Owl	G4	S3B
Cynomys parvidens	Utah Prairie-dog	G1	S1

Solar facilities should not be built on ether occupied or historic prairie dog towns. BLM should avoid impacts to lands with past or currently active prairie dog towns by siting projects away from those areas.

Burrowing owl habitat involves owl dens in the brush community. Solar facilities should not be constructed where past or currently occupied owl dens are found.

Pygmy rabbit populations are strongly tied to sage steppe habitat. Occupied populations should be avoided for solar facility sites. Relocation of these species to other sites has not proven successful to date.

All these sites are in pronghorn habitat ranked as "high," meaning this habitat is important for this species and management should consider meeting antelope needs in this area. Fences are one of the greatest threats to pronghorn. Unless necessary to protect pronghorn from machinery and infrastructure from solar energy development or other human activity, new and existing fences should be modified so that pronghorn can pass under the fence. A barbless lower wire set about 18 inches above ground usually is enough to allow pronghorn to pass through.

Recommendations: BLM should analyze potential impacts to wildlife habitat from designating the Escalante Valley SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

iii. Site-specific results of GIS analysis for Milford Flats South SESA

The sensitive species found at this site include:

Microdipodops megacephalus	Dark Kangaroo Mouse	G5	S2?
Centrocercus urophasianus	Greater Sage-grouse	G4	S2?
Asio flammeus	Short-eared Owl	G5	S2
Athene cunicularia	Burrowing Owl	G4	S3B
Buteo regalis	Ferruginous Hawk	G4	S2S3B,S2N

The State of Utah has a watershed restoration initiative that has given priority to certain habitat where management needs to change in order to improve important wildlife habitat. The southern part of the Milford Flats proposed site just overlaps the northern part of a focus area. Sage grouse are the key species in this priority habitat area. Leks and brood areas that are currently used by sage grouse should not be used for solar sites. Solar projects, transmission lines and associated infrastructure should be designed so that raptor predation does not increase because the raptors can perch on these facilities. There are a number of approaches to ensuring that power poles and buildings don't create this problem.

In 1984, BLM developed a land use plan for the area including the Milford Flats and Escalante Desert proposed sites. This plan is identified as the Cedar Beaver Garfield Antimony Resource Management Plan. In this plan, a number of pieces of public lands are made available for disposal. This means that those sites may be sold out of the public estate and become private lands. This PEIS needs to modify that older RMP in order to retain in public ownership any lands included in SESAs.

The RMP for this locale lists special designations for off-road vehicle management. This plan identified seasonal closures for ORVs to protect golden eagle nests, broods, and perch sites. Any solar energy development should not include these nesting sites in the facility.

The comment made for the Escalante Valley SESA about pronghorn antelope also applies for this site.

Recommendations: BLM should analyze potential impacts to wildlife habitat from designating the Milford Flats South SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

b. Wah Wah Valley SESA

i. Recommendation that BLM include the Wah Wah Valley SESA in the Draft PEIS but deprioritize development there

We recommend that BLM include the Wah Wah Valley SESA in the Draft PEIS, but deprioritize development there. Unlike the Escalante Valley and the Milford Flats South SESAs, the Wah Wah Valley SESA does not lie near existing high-capacity transmission lines (although it does lie along a proposed Section 368 Energy Corridor). *See* West Wide Energy Corridor Final PEIS, *available at* http://corridoreis.anl.gov/eis/fmap/sbm/index.cfm.

Importantly, the Wah Wah Valley is surrounded on both the east and the west by areas proposed for wilderness designation in America's Red Rock Wilderness Act (*see* WUP map attached as Attachment A). Although the Wah Wah Valley SESA is not within an area proposed for wilderness in ARRWA, the Wah Wah Valley retains its wild and generally undisturbed character, as well as its impressive visual resources. Development in the Wah Wah Valley has the potential to impact the wilderness experience from the San Francisco Mountains east of the valley and the Wah Wah Mountains west of the valley, by limiting the naturalness and solitude of these wilderness-quality mountains, and affecting the experience of recreationists who visit the mountains on either side of the valley.

Unlike the Escalante Valley and the Milford Flats South SESAs, which are located on lands governed by the Cedar Beaver Garfield Antimony Resource Management Plan (CBGA RMP), the management guidance for the lands in the Wah Wah Valley comes from the Pinyon Management Framework Plan (MFP), which was completed 26 years ago, in 1983. MFPs are very different documents from RMPs. The primary distinction is that RMPs are considered major federal actions under the National Environmental Policy Act (NEPA), and necessitate the preparation of an Environmental Impact Statement (EIS). 43 C.F.R. 1601.0-6; *see* 40 C.F.R. § 1502. The completion of an MFP, however, does not necessitate the completion of an EIS, or even an Environmental Assessment (EA). *See* 40 C.F.R. § 1508.10; *Southern Utah Wilderness Alliance (SUWA), et al.*, 164 IBLA 118, 124 (2004).

According to regulations governing the BLM, 43 C.F.R. § 1610.8(a)(1), MFPs may serve as the basis for considering proposed actions, but only until superseded by RMPs. These regulations governing MFPs were published in 1979 and the drafters envisioned that MFPs would govern land management only for a "transition period" until RMPs could be completed. *See* 43 C.F.R. § 1610.8(b) (1979); *SUWA*, 164 IBLA at 124. Thirty years after these regulations were passed, the Pinyon MFP remains the governing management document for the Wah Wah Valley.

Because of the difference between MFPs and RMPs, and the corresponding lack of environmental analysis in the Pinyon MFP, different considerations apply to the Wah Wah Valley SESA than the other two SESAs. The Agencies must ensure that BLM completes any additional analysis required due to the lack of an EIS for the Wah Wah Valley.

Indeed, section 201 of the Federal Land Policy and Management Act (FLPMA) requires that BLM conduct periodic resource inventories and keep these inventories current. 43 U.S.C. § 1711. Under FLPMA, BLM "shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values . . . This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. § 1711(a). Thus, FLPMA requires BLM to identify any visual resources that exist by conducting visual resource inventories and repeating these inventories as necessary to keep them current. Therefore, BLM is required to consider whether, and to what extent, visual resource values are now present in the Wah Way Valley and, if the values are present, how development of the Wah Wah Valley SESA would protect these values. As far as SUWA knows, the last visual resources inventory of the Wah Wah Valley occurred with the preparation of the Pinyon MFP, prior to 1983. *See* Pinyon MFP at Appendix VR.

In addition, because the Wah Wah Valley SESA is located further from existing transmission lines and remains relatively undisturbed, solar development in the Wah Wah Valley would result in more surface disturbance and would create a concomitant increase in the amount of dust generated, which would have ecological and health impacts, as discussed above. *See, e.g.*, Attachment B (attached), photos taken in July 2009 in southwestern Utah's Pine Valley, one valley west of the Wah Wah Valley, and one of the light blue areas on the SESA Map prepared June 5, 2009; Streater, Scott, *Climate Change, Water Shortages Conspire to Create 21st Century Dust Bowl*, THE NEW YORK TIMES, (May 14, 2009) (article mentions probable escalation of the dust problem due to renewable energy development) (attached as Attachment C); Nelson, Paul, *Health Experts Warn Utah Residents to Prepare for the Dust*, KSL NEWS, (July 8, 2009) (attached as Attachment D).

Recommendations: For the reasons listed above, we recommend that BLM include the Wah Wah Valley SESA in the Draft PEIS but prioritize the development of the Escalante Valley and Milford Flats SESAs and delay the development of the Wah Wah Valley SESA. BLM should prioritize analysis of the potential issues raised above and in the results of the GIS analysis in section III b. ii. below.

ii. Site-specific results of GIS analysis for Wah Wah Valley SESA

The sensitive species that depend on this habitat are listed below:

Microdipodops megacephalus	Dark Kangaroo Mouse	G5	S2?
Haliaeetus leucocephalus	Bald Eagle	G4	S1B,S3N
Buteo regalis	Ferruginous Hawk	G4	S2S3B,S2N
Athene cunicularia	Burrowing Owl	G4	S3B
Vulpes macrotis	Kit Fox	G4	S3?

Protection for golden eagle nests, broods, and perch sites should be carefully considered for this SESA. Any solar energy development should not include these types of avian use sites in the facility.

The issues concerning burrowing owls that were described earlier also apply to this site. Ferruginous hawks both nest on the ground and use similar habitat for foraging. They abandon nests near human activities. While a nest site in this location is unlikely, this should be verified and facilities should not be built within a half mile of any nests which are found. Feruginous hawks often lose habitat to other raptors when additional perching structures are built. Power lines, buildings, and other facilities pose serious threats to continued availability of viable habitat for Ferruginous hawks. Other raptors, such as red-tailed hawks are more adapted to human activity and can displace other native raptors. The solution is that any structure added to the landscape be designed to prevent raptor perching.

Kit fox use of the site needs to be evaluated and management changed or individual project proposals modified to maintain this population at its full potential for this habitat. Similarly, the needs of the dark kangaroo mouse need to be evaluated relative to this SESA.

The comments made about pronghorn antelope and burrowing owls also apply for this SESA.

Recommendations: BLM should analyze potential impacts to wildlife habitat from designating the Wah Wah Valley SESA and the impacts of potential solar development in the SESA, identify opportunities to minimize and mitigate any potential impacts in the Draft PEIS, and require that impacts be minimized and mitigated.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202

Michael J. Painter, Coordinator
Californians for Western Wilderness

P.O. Box 210474
San Francisco, CA 94121-0474

Tiffany Bartz, Field Attorney
Southern Utah Wilderness Alliance
425 East 100 South
Salt Lake City, UT 84111

Tom Darin, Staff Attorney, Energy Transmission
Western Resource Advocates
2260 Baseline Rd., Suite 200
Boulder, CO 80302

Jim Catlin, Project Coordinator
Wild Utah Project
68 S. Main Street
Salt Lake City, UT 84101

Exhibit 12: Cultural Resources Comments on Solar Energy Study Areas

These comments are a subset of the comments written by the National Trust for Historic Preservation (The National Trust) and are included with their permission.

Please accept and fully consider these comments, submitted on behalf of The Wilderness Society.

I. BLM should evaluate whether to exclude additional cultural resources from SESAs and whether site-specific measures are necessary to avoid or mitigate adverse effects on cultural resources.

Potential impacts to all cultural resources—including prehistoric, historic and traditional sacred and cultural properties—located within SESAs and in proposed solar project areas outside SESAs should be considered in the NEPA and NHPA processes. In addition, we believe that BLM should evaluate whether the following cultural resources should be excluded from the SESAs in light of their significance and whether BLM should include site-specific measures in the PEIS in order to avoid or mitigate the potential adverse effects of solar energy development on those resources.

A. Arizona

The three SESAs in Arizona appear to have been well chosen in regard to archaeological sites, as they consist largely of previously disturbed lands. However, some Native American tribes have already expressed concern about impacts of the SESAs on sacred landscapes. Thus, BLM should thoroughly consult with concerned tribes to resolve potential conflicts now. In addition, many nationally and regionally significant historic trails cross the state and could be directly or indirectly impacted by solar energy development both within and outside the SESAs. Of particular concern are trails located in open areas of southwestern Arizona, including the Juan Bautista de Anza National Historic Trail (NHT), El Camino del Diablo, the Ehrenberg Road and the Phoenix Stage Roads. The latter two, in particular, appear to be located close to the Brenda and Gillespie SESAs. While the Federal Register notice states that BLM excluded national trails from the SESAs, BLM must still consider any visual and other types of indirect impacts, such as from increased public access during project construction, that solar energy development may have on the trails. To that end, BLM should develop stipulations for avoiding or mitigating indirect impacts to trails during solar energy development.

B. California

The National Trust is concerned specifically with potential adverse effects to cultural resources within the Riverside East SESA. This area partially overlaps with the boundaries of historic Camp Rice, part of the World War II (WWII) Desert Training Center/ California–Arizona Maneuver Area that has been recommended eligible for the National Register of Historic Places (National Register). Camp Rice is part of an interconnected landscape of similar WWII camp sites in southern California and Arizona and is highly significant both for its association with General Patton and for its

contribution to our understanding of how American soldiers were trained during WWII. Still visible at Camp Rice are roads and walkways lined with large pieces of basalt. BLM should modify the boundary of the Riverside East SESA to exclude Camp Rice and other sites within this important WWII cultural landscape.

C. Colorado

The National Trust is concerned about potential adverse effects to cultural resources located within the De Tilla Gulch and Fourmile East SESAs. Both contain rare Paleoindian archaeological sites whose eligibility for the National Register has generally not yet been determined. Because of Paleoindian sites' potential significance, BLM should develop specific mitigation measures to resolve adverse effects to them. Finally, the National Trust requests that BLM take a close look at the potential of the Fourmile East SESA to directly or indirectly affect the Old Spanish National Historic Trail.

D. Nevada

The National Trust is concerned about potential adverse effects to prehistoric cultural resources in the Delamar Valley SESA. Two significant and large rock art sites in this SESA are "The Gathering," located along the Alamo Road off Hwy. 93 and "Rattlesnake Road," located approximately 2.5 miles farther east on the Alamo Road. Because the sites are located adjacent to the road, increased construction traffic could lead to increased visitation and inadvertent or purposeful damage by visitors. In addition, the National Trust requests that BLM take a close look at the potential of the Dry Lake SESA to directly or indirectly affect the Old Spanish National Historic Trail.

E. New Mexico

The National Trust has no specific concerns about cultural resources located within or near the proposed SESAs in New Mexico.

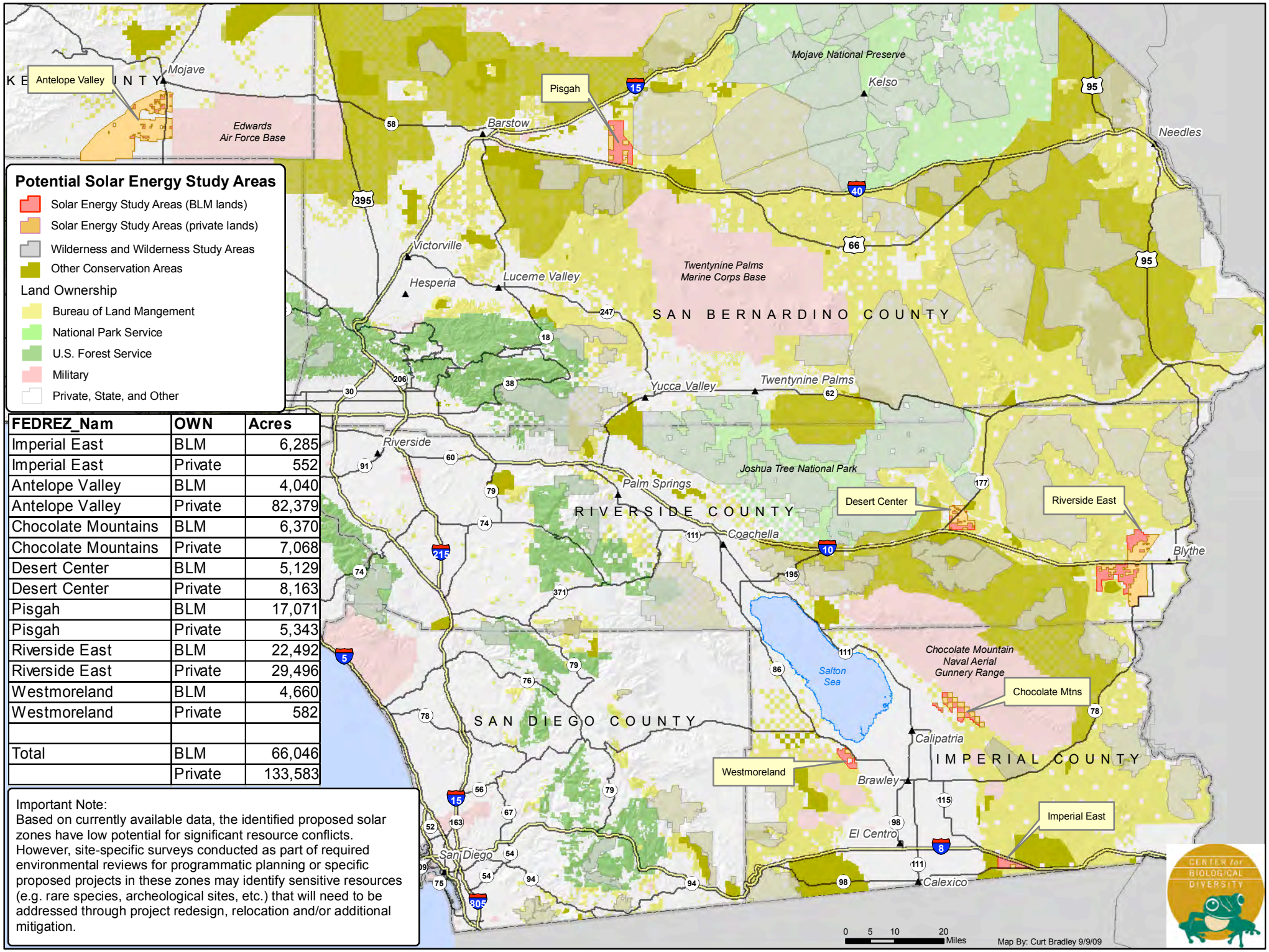
F. Utah

The National Trust requests that BLM take a close look at the potential of the Escalante Valley, Milford Flats South and Wah Wah Valley SESAs to directly or indirectly impact the Old Spanish NHT.

Thank you for fully considering these comments. We look forward to continuing working with BLM in the development of the Solar PEIS.

Sincerely,

Alex Daue, Renewable Energy Coordinator
The Wilderness Society
1660 Wynkoop St. Suite 850
Denver, CO 80202



FEDREZ_Nam	OWN	Acres
Imperial East	BLM	6,285
Imperial East	Private	552
Antelope Valley	BLM	4,040
Antelope Valley	Private	82,379
Chocolate Mountains	BLM	6,370
Chocolate Mountains	Private	7,068
Desert Center	BLM	5,129
Desert Center	Private	8,163
Pisgah	BLM	17,071
Pisgah	Private	5,343
Riverside East	BLM	22,492
Riverside East	Private	29,496
Westmoreland	BLM	4,660
Westmoreland	Private	582
Total	BLM	66,046
	Private	133,583

Important Note:
Based on currently available data, the identified proposed solar zones have low potential for significant resource conflicts. However, site-specific surveys conducted as part of required environmental reviews for programmatic planning or specific proposed projects in these zones may identify sensitive resources (e.g. rare species, archeological sites, etc.) that will need to be addressed through project redesign, relocation and/or additional mitigation.

STATE OF CALIFORNIA

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of: The Application for Certification for the IVANPAH SOLAR ELECTRIC GENERATING SYSTEM	Docket No. 07-AFC-5

Testimony of Bill Powers, P.E.
Ivanpah Solar Electric Generating System
Docket 07-AFC-5

December 16, 2009

Bill Powers, P.E.
Powers Engineering
4452 Park Blvd., Suite 209
San Diego, CA 92116
(619) 295-2072
(619) 295-2073 Fax
bpowers@powersengineering.com

I. Introduction

My testimony addresses the inadequate analysis of the distributed photovoltaic (PV) alternative to the proposed Ivanpah Solar Electric Generating System (ISEGS) in the Final Staff Analysis (FSA). I am a registered professional mechanical engineer in California with over 25 years of experience in the energy and environmental fields. I have permitted five 50 MW peaking turbine installations in California, as well as numerous gas turbine, microturbine, and engine cogeneration plants around the state. I organized conferences on permitting gas turbine power plants (2001) and dry cooling systems for power plants (2002) as chair of the San Diego Chapter of the Air & Waste Management Association. I am the author of the October 2007 strategic energy plan for the San Diego region titled "San Diego Smart Energy 2020." The plan uses the state's Energy Action Plan as the framework for accelerated introduction of local renewable and cogeneration distributed resources to reduce greenhouse gas emissions from power generation in the San Diego region by 50 percent by 2020. I am the author of several 2009 articles in Natural Gas & Electricity Journal on the use of large-scale distributed PV in urban areas as a cost-effective substitute for new gas turbine peaking capacity.

II. Rooftop PV Is at the Top of the Energy Action Plan Loading Order

The FSA states, in discussing the conservation and demand-side management alternative to ISEGS, that cost-effective energy efficiency is the resource of first choice in meeting California's energy needs (p. 4-77):

> Conservation and demand-side management consist of a variety of approaches to reduction of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. In 2005 the Energy Commission and CPUC's Energy Action Plan II declared cost effective energy efficiency as the resource of first choice for meeting California's energy needs.

The CEC and the CPUC developed the "Energy Action Plan" in 2003 to guide strategic energy decisionmaking in California. The Energy Action Plan establishes the energy resource "loading order," or priority list that defines how California's energy needs are to be met. Energy Action Plan I was published in May 2003.[1] Energy Action Plan I describes the loading order in the following manner (p. 4):

> The Action Plan envisions a "loading order" of energy resources that will guide decisions made by the agencies jointly and singly. First, the agencies want to optimize all strategies for increasing conservation and energy efficiency to minimize increases in electricity and natural gas demand. Second, recognizing that new generation is both necessary and desirable, the agencies would like to see these needs met first by renewable energy resources and distributed generation. Third, because the preferred resources require both sufficient investment and adequate time to "get to scale," the agencies also will support additional clean, fossil fuel, central-station generation. Simultaneously, the agencies intend to improve the bulk electricity transmission grid and distribution facility infrastructure to support growing demand centers and the interconnection of new generation.

[1] Energy Action Plan I: http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF

Energy Action Plan I, Under "Optimize Energy Conservation and Resource Efficiency," states (p. 5):

> Incorporate distributed generation or renewable technologies into energy efficiency standards for new building construction.

Energy Action Plan I identifies rooftop PV as a de facto energy efficiency measure with this statement. As noted in the ISEGS FSA (p. 4-77), energy efficiency is at the top of the loading order. Energy Action Plan I also states, Under "Promote Customer and Utility-Owned Distributed Generation," (p. 7):

> Distributed generation is an important local resource that can enhance reliability and provide high quality power, without compromising environmental quality. The state is promoting and encouraging clean and renewable customer and utility owned distributed generation as a key component of its energy system. Clean distributed generation should enhance the state's environmental goals. This determined and aggressive commitment to efficient, clean and renewable energy resources will provide vision and leadership to others seeking to enhance environmental quality and moderate energy sector impacts on climate change. Such resources, by their characteristics, are virtually guaranteed to serve California load. With proper inducements distributed generation will become economic.
>
> - Promote clean, small generation resources located at load centers.
> - Determine system benefits of distributed generation and related costs.
> - Develop standards so that renewable distributed generation may participate in the Renewable Portfolio Standard program.

Energy Action Plan I prioritizes rooftop PV as the preferable renewable resource, but indicates obliquely that it is costly and that in any case distributed PV is not eligible to participate in the Renewable Portfolio Standard (RPS) program. Therefore investor-owned utilities have no incentive to develop distributed PV resources. Since Energy Action Plan I was approved in 2003, PV cost has dropped dramatically. Commercial distributed PV is half the cost it was in 2003 and costs continue to drop. Residential PV is following quickly behind. Distributed PV is also now eligible for the RPS program.[2]

Energy Action Plan II was adopted in September 2005.[3] The purpose of Energy Action Plan II is stated as (p. 1): "EAP II is intended to look forward to the actions needed in California over the next few years, and to refine and strengthen the foundation prepared by EAP I." Energy Action Plan II reaffirms the loading order stating (p. 2):

> EAP II continues the strong support for the loading order – endorsed by Governor Schwarzenegger – that describes the priority sequence for actions to address increasing energy needs. The loading order identifies energy efficiency and demand response as the

[2] CPUC Press Release – Docket A.08-03-015, *CPUC Approves Edison Solar Roof Program*, June 18, 2009. "The energy generated from the project will be used to serve Edison's retail customers and the output from these facilities will be counted towards Edison's RPS goals."
[3] Energy Action Plan II: http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF

> State's preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, we rely on renewable sources of power and distributed generation, such as combined heat and power applications. To the extent efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, we support clean and efficient fossil-fired generation.

The CEC's *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report* (December 2009), underscores the integration of building PV as a critical component of "net zero" energy use targets for new residential and commercial construction, under the heading "Energy Efficiency and the Environment," explaining:[4]

> With the focus on reducing GHG emissions in the electricity sector, energy efficiency takes center stage as a zero emissions strategy. One of the primary strategies to reduce GHG emissions through energy efficiency is the concept of zero net energy buildings. In the 2007 IEPR, the Energy Commission recommended increasing the efficiency standards for buildings so that, when combined with on-site generation, newly constructed buildings could be zero net energy by 2020 for residences and by 2030 for commercial buildings.
>
> A zero net energy building merges highly energy efficient building construction and state-of-the-art appliances and lighting systems to reduce a building's load and peak requirements and includes on-site renewable energy such as solar PV to meet remaining energy needs. The result is a grid-connected building that draws energy from, and feeds surplus energy to, the grid. The goal is for the building to use net zero energy over the year."

The FSA is flawed in its failure to identify rooftop PV as a higher priority in the Energy Action Plan loading order than utility-scale remote solar resources like ISEGS.

III. FSA Rationale for Eliminating Rooftop PV is Flawed

The FSA correctly describes that a distributed rooftop PV alternative has essentially no environmental impact, stating (p. 4-63 to 4-66):

- Distributed solar PV is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required and there would be few associated biological impacts.
- Relatively minimal maintenance and washing of the solar panels would be required.
- Because most PV panels are black to absorb sun, rather than mirrored to reflect it, glare would not create visual impacts as with the power tower, Fresnel, and trough technologies.
- Additionally, the distributed solar PV alternative would not require the additional operational components, such as dry-cooling towers, substations, transmission interconnection, maintenance and operation facilities with corresponding visual impacts.

[4] CEC, *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report*, December 2009, p. 56.

The FSA then eliminates distributed PV, citing three specific reasons why achieving 400 MW of distributed PV is not a feasible substitute for ISEGS (FSA, p. 4-54):

- Would depend on additional policy support - Additional legislation for increased incentives may be required to achieve this level of penetration.
- Would require more PV manufacturing capacity - Building 400 MW of distributed solar PV would require an even more aggressive deployment of PV at more than double the historic rate of solar PV than the California Solar Initiative program currently employs.
- Would require PV lower cost than currently exists - systems larger than 750 kW averaged $6.80/watt in 2007.

Each of these justifications for elimination of distributed PV is flawed, as explained in the following paragraphs.

A. Additional Policy Support is Not Required for Distributed PV to Substitute for ISEGS

ISEGS will have a capacity of 400 MW (FSA, p. 4-4). PG&E will receive 300 MW of the ISEGS output and SCE will receive 100 MW (FSA, p. 4-8). The FSA notes that more than 400 MW of distributed PV was in operation in California by the end of 2008, and the PV installation rate is increasing rapidly, nearly doubling between 2008 and 2007.

The FSA correctly describes that both SCE and PG&E, the two entities that would purchase power from the ISEGS, are constructing large distributed PV projects. The 500 MW SCE urban PV project was approved by the CPUC in June 2009. The project will be RPS-eligible and will consist of a 250 MW SCE-owned component and a 250 MW third-party component. The power purchase agreement (PPA) between ISEGS and SCE and PG&E is same type of contract mechanism that will be used by SCE to contract for the 250 MW third-party component of the SCE distributed PV project.

Progress in distributed PV installation rates under the California Solar Initiative (CSI) program provides no insight into the ability of the solar industry to carry-out multiple large-scale distributed PV projects simultaneously, in the range of 400 to 500 MW each, in California. The CSI program is not the vehicle that will be used to build these projects. These projects will be built under long-term PPAs between the distributed PV project developer and a utility within the framework of the RPS program.

An example is the PPA between PG&E and Sempra Generation for 10 MW of fixed thin-film PV in Nevada.[5] The PG&E/Sempra PPA is a technology-differentiated renewable energy contract at a price incrementally higher than the market price referent (MPR) to assure that the project developer, Sempra Generation, makes a reasonable return on its investment. The contract is in effect the equivalent of a technology differentiated feed-in tariff for solar power. No incentives beyond the federal investment tax credit and accelerated depreciation available to any solar energy project were necessary. No incentives beyond those already available would be necessary

[5] CPUC Resolution E-4240, *Approval of a power purchase agreement (PPA) for generation from a new solar photovoltaic facility between PG&E and El Dorado Energy*, LLC (Sempra Generation), May 18, 2009.

to build 400 MW of distributed PV under long-term PPAs with PG&E and SCE to substitute for ISEGS.

Sempra Generation touts the cost of power generated by its 10 MW PV installation in Nevada as "the lowest cost solar energy in the world."[6] The company specifically mentions power tower projects (like ISEGS) as producing higher-cost solar energy and being commercially unproven, stating:[7]

> Sempra has also evaluated solar thermal power technologies, which use a field of mirrors to concentrate the sunlight to produce heat for electricity generation. The company has found that using solar panels is the cheaper option, (CEO) Allman said. He noted that some of the solar thermal power technologies, such as the use of a central tower for harvesting the heat and generating steam, have yet to be proven commercially.

SCE has a similar RPS-eligible PPA with NRG for the output of a 21 MW fixed thin-film PV array in Blythe, California.[8] This project began operation in December 2009 and also consists of fixed thin-film PV panels.

B. IOUs Need Only Provide a Basic Level of Existing Information on Individual IOU Substation Capacities to PV Developers to Interconnect Over 13,000 MW of Distributed PV with Minimal Interconnection Cost

SCE expressed confidence in its March 2008 application to the CPUC for a 250 to 500 MW urban PV project that it can absorb thousands of MW of distributed PV without additional distribution substation infrastructure, stating "SCE's Solar PV Program is targeted at the vast untapped resource of commercial and industrial rooftop space in SCE's service territory"[9] and "SCE has identified numerous potential (rooftop) leasing partners whose portfolios contain several times the amount of roof space needed for even the 500 MW program."[10]

SCE stated it has the ability to balance loads at the distribution substation level to avoid having to add additional distribution infrastructure to handle this large influx of distributed PV power.[11] SCE explains:

> SCE can coordinate the Solar PV Program with customer demand shifting using existing SCE demand reduction programs on the same circuit. This will create more fully utilized distribution circuit assets. Without such coordination, much more distribution equipment may be needed to increase solar PV deployment. SCE is uniquely situated to combine solar PV Program generation, customer demand programs, and advanced distribution circuit design

---

[6] GreenTech Media, *Sempra Wants 300 MW Plus of Solar in Arizona*, April 22, 2009. "The electricity we are getting out of the 10-megawatt is the lowest cost solar energy ever generated from anywhere in the world." (CEO Michael Allman).
[7] Ibid.
[8] First Solar press release, *First Solar Sells California Solar Power Project to NRG*, November 23, 2009.
[9] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Application*, March 27, 2008, p. 6.
[10] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Testimony*, March 27, 2008, p. 44.
[11] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Application*, March 27, 2008, pp. 8-9.

> and operation into one unified system. This is more cost-effective than separate and uncoordinated deployment of each element on separate circuits.[12]

As SCE states, "Because these installations will interconnect at the distribution level, they can be brought on line relatively quickly without the need to plan, permit, and construct the transmission lines."[13] This statement was repeated and expanded in the CPUC's June 18, 2009 press release regarding its approval of the 500 MW SCE urban PV project:[14]

> Added Commissioner John A. Bohn, author of the decision, "This decision is a major step forward in diversifying the mix of renewable resources in California and spurring the development of a new market niche for large scale rooftop solar applications. Unlike other generation resources, these projects can get built quickly and without the need for expensive new transmission lines. And since they are built on existing structures, these projects are extremely benign from an environmental standpoint, with neither land use, water, or air emission impacts. By authorizing both utility-owned and private development of these projects we hope to get the best from both types of ownership structures, promoting competition as well as fostering the rapid development of this nascent market."

The CPUC has also calculated, for the entire inventory of approximately 1,700 existing investor-owned utility (IOU) substations, the amount of distributed PV that could be accommodated with minimal interconnection cost based on the following reasoning:[15]

> Rule 21 specifies maximum generator size relative to the peak load on the load at the point of interconnection at 15%. So, for example, if a generator is interconnected on the low side of a distribution substation bank with a peak load of 20 MW, the maximum Rule 21 interconnection criteria would allow a 3 MW system (3 MW = 15% * 20 MW).
>
> However, the 15% criterion, which is established for all generators regardless of type, was adjusted to 30% for the purposes of determining the technical potential of PV. The 15% limit is established at a level where it is unlikely the generator would have a greater output than the load at the line segment, even in the lowest load hours in the off-peak hours and seasons (such as the middle of the night and in the spring). Since the peak output for photovoltaics is during the middle of the day, PV is unlikely to have any output when loads are lowest. Therefore, a 30% criterion was used for technical interconnection potential estimates. The discussion was held with utility distribution engineers, however, we did not consider formal engineering studies or Rule 21 committee deliberation since the purpose of the analysis was only to define potential.

The CPUC assumes that larger PV arrays will be connected directly to the substation low-side (12 kV) load bank. SDG&E estimated that the cost of a 10 MW feeder is $0.6 million per mile.[16]

---

[12] Ibid, p. 9.
[13] Ibid, p. 6.
[14] CPUC Press Release – Docket A.08-03-015, *CPUC Approves Edison Solar Roof Program*, June 18, 2009.
[15] CPUC Rulemaking R.08-08-009 – California RPS Program, Administrative Law Judge's Ruling on Additional Commission Consideration of a Feed-In Tariff, *Attachment A - Energy Division FIT Staff Proposal*, March 27, 2009, p. 15.
[16] Application No. 06-08-010, Matter of the Application of San DiegoGas & Electric Company (U-902-E) for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, *Chapter 5:*

The cost of a 3-mile long dedicated feeder from multiple rooftop PV arrays with a combined capacity of 10 MW to the low-side bus of the substation would be less than $2 million based on SDG&E's cost estimate.

The current capital cost for state-of-the-art commercial rooftop PV is approximately $3,700/kW$_{ac}$. The gross capital cost of 10 MW of rooftop PV at current prices would be $3,700/kW x (1,000 kW/MW) x 10 MW = $37 million. The cost to construct a dedicated feeder to interconnect 10 MW of rooftop PV would be approximately 5 percent of the gross project capital cost. This is a relatively minor cost and represents no financial impediment to developing urban rooftop PV resources.

An upgrade at the substation would be necessary to accommodate the higher powerflows in cases where distributed PV, concentrated on clusters of large rooftops, could provide up to 100 percent of a single substation's peak load. A typical 12 kV/69 kV substation can be upgraded to allow two-way powerflows for up to 100 MW of interconnected distributed PV. SDG&E estimates the cost to build a new 12 kV/69 kV substation is $25 million.[17] The upgrades necessary to allow problem-free two-way powerflow across an existing substation should cost considerably less than a new substation. However, even the cost of a new substation, at $25 million, is less than 10 percent of the gross capital cost of 100 MW of state-of-the-art PV at 2009 prices. The substation upgrade cost would be relatively minor compared to the gross capital cost of 100 MW of PV arrays, and would not present a substantive financial hurdle to developing a 100 MW distributed PV resource concentrated in an area served by a single existing substation.

As a component of the DG FIT development process, the CPUC requested data on peak loads at all IOU substations from the IOUs and compiled that information graphically as shown in Figure 1. According to the CPUC, this data was obtained from IOU distribution engineers.[18] I calculate that approximately 13,300 MW of PV can be connected directly to IOU substation load banks based on the data in Figure 1. The supporting calculations for this estimate are provided in Table 1.

The IOUs provide about two-thirds of electric power supplied in California, with publicly-owned utilities like the Los Angeles Department of Water & Power and the Sacramento Municipal Utility District and others providing the rest.[19] Assuming the substation capacity pattern in Figure 1 is also representative of the non-IOU substations, the total California-wide PV that could be interconnected at substation low-side load banks with no substantive substation upgrades would be [13,300/(2/3)] = 19,950 MW.

Prepared Rebuttal Testimony of SDG&E in Response to Phase 2 Testimony of Powers Engineering, March 28, 2008, p. 5.20.

[17] Ibid, p. 5.21.

[18] CPUC Rulemaking R.08-08-009 – California RPS Program, Administrative Law Judge's Ruling on Additional Commission Consideration of a Feed-In Tariff, *Attachment A - Energy Division FIT Staff Proposal*, March 27, 2009, pp. 15-16.

[19] CEC, *2007 Integrated Energy Policy Report*, December 2007, Figure 1-11, p. 27.

Figure 1. IOU Substation peak loads, 30% of peak load, and 10 MW reference line

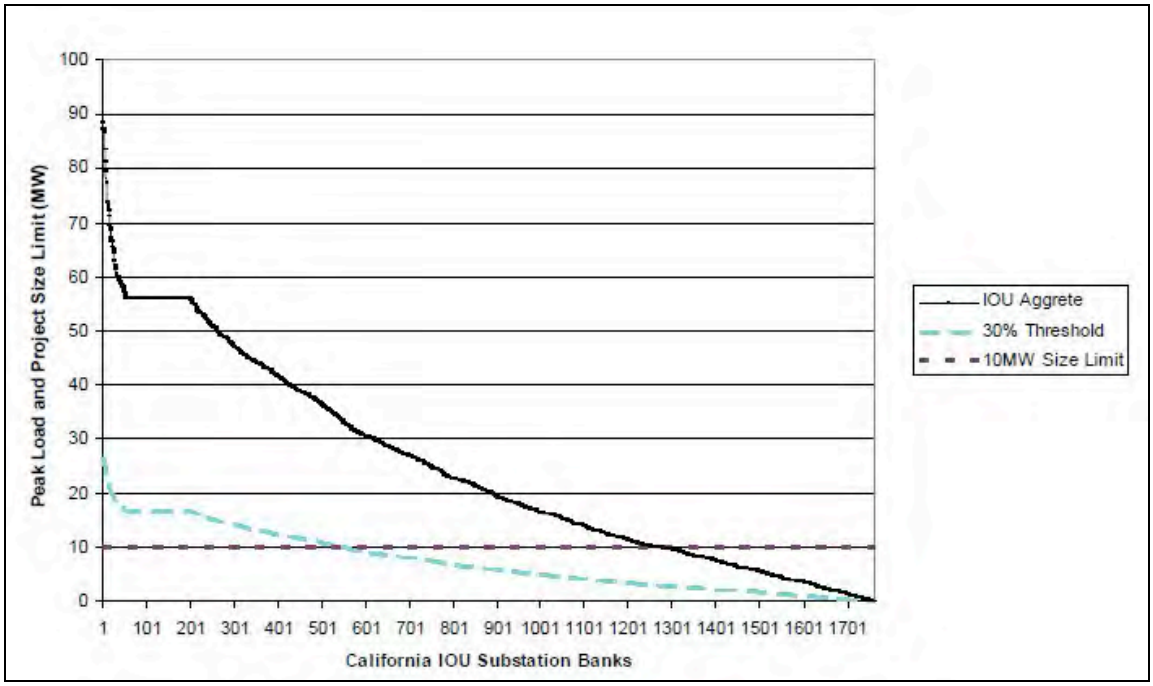


Table 1. Calculation of distributed PV interconnection capacity to existing IOU substations with minimal interconnection cost from data in Figure 1

Substation range	Number of substations	Calculation of distributed PV that could be interconnected with minimal substation upgrades (MW)	Total distributed PV potential (MW)
1-200	200	average peak ~60 MW x 0.30 = 18 MW	3,600
201-500	300	average peak ~45 MW x 0.30 = 13.5 MW	4,000
501-800	300	average peak ~30 MW x 0.30 = 9 MW	2,700
801-1,000	200	average peak ~20 MW x 0.30 = 6 MW	1,200
1,001-1,600	600	average peak ~10 MW x 0.30 = 3 MW	1,800
		Distributed PV total:	13,300

In sum, approximately 20,000 MW of distributed PV interconnection capacity is available now in California that would require little or no substation upgrading to accommodate the PV.

C. There Is No Security Justification for IOU's Withholding Information on Substation Capacities and Locations from Private PV Developers

The rationale put forth for restricting information to private distributed PV project developers includes "Providing details on distribution system could compromise homeland security" and

"Information on peak loads and system configuration may be considered commercially sensitive."[20] There is no sound basis for these two justifications.

In the first instance, climate change is seen as a major threat to national security by the U.S. defense establishment.[21] Withholding information that would allow rapid progress on addressing climate change on homeland security grounds is contrary to the national security interest. Secondly, all IOU expenditures are passed on to customers. The withholding of information on peak loads and system configuration by the IOU to protect unsubstantiated commercial sensitivity concerns, to the extent it prevents the rapid deployment of competitively-bid distributed PV in urban centers at or near the point-of-use, would have a potentially substantial negative impact on ratepayers and slow progress on addressing climate change.

Much of the necessary information is already in the public domain in some form and should be compiled and made available to distributed PV developers in a transparent and efficient format. For example, the CPUC already has the data on IOU substation interconnection limitations as shown in Figure 1. Another example is information on the location of IOU substations. Maps showing the location of all IOU substations are readily available for purchase from the CEC Cartography Unit.

The province of Ontario (Canada) makes publicly-available information on substation location and available capacity to facilitate the development of distributed PV in the province.[22] This same information protocol should be followed by California IOUs.

Finally, SCE must provide this type of information to third-party PV developers for the 250 MW private PV developer set-aside component of its 500 MW urban PV project approved by the CPUC in June 2009.

D. There is Sufficient Existing Large Commercial Roof Space in PG&E and SCE Territory to Build At Least Twenty ISEGS Plants

The 2009 IEPR Final Committee Report recognizes the huge technical potential of rooftop distributed PV to meet California's renewable energy targets, stating:[23]

> Recent studies indicate substantial technical potential for distribution-level generation resources located at or near load. A 2007 estimate from the Energy Commission suggests that there is roof space for over 60,000 MW of PV capacity, although the study did not factor in roof space that is shaded or being used for another purpose.

60,000 MW is approximately the peak summertime load for all of California, and 150 times the 400 MW capacity of ISEGS. It is important to note that the 2009 IEPR document is incorrect in asserting the 2007 rooftop PV estimate did not factor in roof shading or other limitations. The

---

[20] E3 and Black & Veatch, *Straw proposal of solution to address short-term problem of information gap*, presentation at CPUC Re-DEC Working Group Meeting, December 9, 2009, p. 9. Online at: http://www.cpuc.ca.gov/PUC/energy/Renewables/Re-DEC.htm

[21] New York Times, *Climate Change Seen as Threat to U.S. Security*, August 9, 2009.

[22] E3 and Black & Veatch, *Straw proposal of solution to address short-term problem of information gap*, presentation at CPUC Re-DEC Working Group Meeting, December 9, 2009, p. 8.

[23] CEC, *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report*, December 2009, p. 193.

60,000 MW estimate assumes only 24 percent of the rooftop of a typical tilt-roof residential rooftop is available for PV, and only 60 to 65 percent of flat-roof commercial rooftops are available for PV. The rationale for these estimates is explained in the 2007 (Navigant) estimate.[24]

The 60,000 MW rooftop PV estimate by Navigant does not account for any of the distributed PV described in the Renewable Energy Transmission Initiative (RETI) process. RETI is California's ongoing renewable energy transmission siting process. RETI evaluated a distributed PV alternative that would produce 27,500 MW from 20 MW increments of ground-mounted PV arrays at 1,375 non-urban substations around the state.[25] This is similar to the approach that PG&E is following. Constructing distributed PV arrays around substations is the primary focus of PG&E's 500 MW distributed PV project.[26]

Black & Veatch is the engineering contractor preparing the RETI reports. Energy & Environmental Economics, Inc. (E3) is the engineering contractor that prepared the June 2009 CPUC preliminary analysis of the cost to reach 33 percent renewable energy by 2020. These two firms now lead the CPUC's renewable distributed generation ("Re-DEC") working group process. The presentation of E3 and Black & Veatch at the December 9, 2009 initial meeting of the Re-DEC Working Group included an estimate of over 8,000 MW_{ac} of large commercial roof space in SCE and PG&E service territories in close proximity to existing distribution substations.[27]

Black & Veatch used GIS to identify large roofs in California and count available large roof area. The criteria used to select rooftops included:

- Urban areas with little available land
- Flat roofs larger than ~1/3 acre
- Assume 65 percent usable space on roof
- Within 3 miles of distribution substation

The Black & Veatch estimate for PG&E territory is 2,922 MW_{ac}. The estimate for SCE territory is 5,243 MW_{ac}. This is a combined rooftop PV capacity of over 8,000 MW_{ac}. The combined large commercial rooftop capacity is more than 20 times the 400 MW capacity of ISEGS.

Large commercial rooftop PV capacity is a subset of the universe of all commercial rooftop capacity, which includes medium and small commercial rooftops as well. A 2004 Navigant study prepared for The Energy Foundation estimated the 2010 commercial rooftop PV capacity in California at approximately 37,000 MW.[28] There is a tremendous amount of commercial roofspace available for PV. This roofspace is sufficient to fill the entire renewable energy gap necessary to reach 33 percent by 2020.

---

[24] See: http://www.energy.ca.gov/2007publications/CEC-500-2007-048/CEC-500-2007-048.PDF
[25] Renewable Energy Transmission Initiative, *RETI Phase 1B Final Report*, January 2009, p. 6-25.
[26] PG&E Application A.09-02-019, *Application of Pacific Gas and Electric Company to Implement Its Photovoltaic Program*, February 24, 2009.
[27] E3 and Black & Veatch, *Summary of PV Potential Assessment in RETI and the 33% Implementation Analysis*, presentation at Re-DEC Working Group Meeting, December 9, 2009, p. 24. Online at: http://www.cpuc.ca.gov/PUC/energy/Renewables/Re-DEC.htm
[28] Navigant, *PV Grid Connected Market Potential under a Cost Breakthrough Scenario*, prepared for The Energy Foundation, September 2004, p. 83. California commercial rooftop PV potential estimated at approximately 37,000 MWp.

E. FSA Uses Unsupportable PV Cost that Is Nearly Double the Actual PV Cost in 2009

There is no justification for the FSA using obsolete CSI pricing data from 2007 to eliminate large-scale distributed PV as an alternative to ISEGS when accurate PV pricing data has been available from the SCE application for nearly two years. The FSA cites a large commercial rooftop PV cost of $\$6.80/W_{ac}$. All of the large commercial CSI PV installations through 2007 were conventional polycrystalline silicon PV installations. SCE provided an installed cost of $\$3.50/W_{dc}$ ($\sim\$4/W_{ac}$) in its March 2008 application to the CPUC to build a 250 MW urban PV project. This PV project was based on using state-of-the-art thin-film PV panels, not higher-cost conventional polycrystalline silicon PV panels. As SCE stated in the application to the CPUC, "The cost to our customers of the Solar PV Program will be significant, but far less than the cost of CSI implementation."[29] SCE already had access to the 2007 CSI cost data, cited in the November 2009 FSA as a basis for eliminating the distributed PV alternative, when it made this statement in March 2008. SCE states in testimony supporting its application that "large (CSI) commercial installations cost $6.78/W."[30] The use of obsolete and inapplicable CSI PV cost data is the only reason the FSA can erroneously assert that PV would "greatly increase the total cost of meeting state renewable energy and GHG targets."

The CPUC analyzed the cost of meeting state renewable energy requirements in June 2009.[31] Four renewable energy scenarios were analyzed: 33 percent RPS reference case, high wind case, high out-of-state delivered case, and high DG case. When current state-of-the-art PV pricing is used for high DG case, which includes a large proportion of distributed PV, the CPUC determined that there would be essentially no difference in the cost of meeting state renewable energy targets by relying predominantly on distributed PV instead of building 7,500 MW of remote solar capacity under the 33 percent RPS reference case.[32] This conclusion was reached despite a number of controversial cost assumptions by the CPUC that favored the 33 percent RPS reference case.[33]

Large-scale distributed PV has also been evaluated by RETI. The CEC is fully engaged in the RETI process. The RETI analysis of distributed PV indicates it is the least-cost solar solution to reaching California's target of 33 percent renewable energy by 2020 if state-of-the-art PV pricing is assumed. RETI makes the following points about state-of-the-art PV:[34]

> There is considerable commercial interest in utility-scale "thin film" (PV) systems. This sensitivity tests an alternate thin film technology for solar with capital costs of about $\$3{,}700/kW_{ac}$, roughly half that of tracking crystalline (PV). Notably, these (PV) capital costs are also lower than the large-scale solar thermal projects; therefore thin film solar is assumed to occur both at the distributed scale (20 MW) and also in large scale blocks (150 MW).

---

[29] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Application*, March 27, 2008, p. 7.
[30] Ibid, p. 8.
[31] CPUC, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009.
[32] Ibid, p. 31.
[33] RightCycle Inc. comment letter, working group member response to June 2009 *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, in response to CPUC request for comments, August 28, 2009.
[34] California Energy Commission, *RETI Phase 1B Final Report*, January 5, 2009, p. 5-27, p. 5-28.

This August 2008 RETI report goes on to say that distributed PV at a current state-of-the-art capital cost of $3.70/watt$_{ac}$ can provide two-thirds of what California needs going forward to reach 33 percent renewable energy by 2020:

> The results of this sensitivity run are dramatic. More importantly, the cost-competitive in-state (distributed PV resources) increase by more than 20 times to about 45,000 GWh/yr. This figure is over two-thirds of the net short requirement. The large majority of these (distributed) resources are 20 MW solar PV projects assumed to connect to the distribution system.

RETI reduced its estimate of the gap that must be filled to reach 33 percent by 2020 to 50,862 gigawatt-hours per year (GWh/yr) in October 2009.[35] RETI's estimate of 45,000 GWh/yr of cost-competitive distributed PV resources would meet approximately 90 percent of the gap of 50,862 GWh/yr identified by RETI. The CEC estimated a lower renewable energy gap of 45,000 GWh/yr in June 2009.[36]. RETI's estimate of 45,000 GWh/yr of cost-competitive distributed PV resources would meet 100 percent of the renewable energy gap identified by the CEC in June 2009.

RETI explained the genesis of the $3.70/watt$_{ac}$ thin-film PV capital cost as:[37]

> An "alternate scenario" was proposed in the report (Section 3.8) to test lower future solar costs. Black & Veatch will run this scenario for thin film photovoltaic systems with a capital cost of $2,700/kW$_{ac}$ to $3,500/ kW$_{ac}$. This is based on module costs of $1,500/ kW$_{ac}$ to $1,700/ kW$_{ac}$ and "balance of system" costs of $1,200/ kW$_{ac}$ to $1,800/ kW$_{ac}$. These module costs are based on First Solar's 2010 target production cost of $0.90/watt$_{dc}$. Balance of system includes inverters, installation, mounting systems and site costs."

First Solar states its average panel production cost in the third quarter of 2009 was $0.85/watt$_{dc}$, somewhat less then the $0.90/watt$_{dc}$ price basis used by Black & Veatch to establish a $2,700/ kW$_{ac}$ to $3,500/ kW$_{ac}$ price range for thin-film PV in the RETI process.[38] Therefore use of a $3.70/watt$_{ac}$ capital cost is conservative for thin-film PV in 2009.

Southern California Edison's 500 MW urban warehouse PV project in San Bernardino and Riverside is based on the same PV technology (First Solar) and pricing that RETI indicates should lead to distributed PV dominating solar development in California to meet RPS goals.[39] SCE estimated a cost for its urban thin-film PV project of $3,500/kW$_{dc}$ in its March 2008 application to the CPUC.[40] As noted, this project was approved by the CPUC in June 2009.

---

[35] RETI, *Phase 2A Final Report Update – Effect of Revised Demand Forecast on RETI Net Short*, Discussion Draft, October 2009.
[36] CEC, *Impact of Assembly Bill 32 Scoping Plan Electricity Resource Goals on New Natural Gas-Fired Generation – Staff Report*, June 2009, p. 1.
[37] RETI, *Phase 1A Final Report*, August 2008, Appendix B, p. 5-5.
[38] See First Solar October 09 fact sheet: http://www.firstsolar.com/pdf/FS_Company_FastFacts_MD-5-601-NA.pdf
[39] CPUC Decision 09-06-049, June 18, 2009. See: http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/102730.htm
[40] SCE Application A.08-03-015, Solar Photovoltaic (PV) Program Testimony, March 27, 2008, p. 17.

F. Market Price Referent with Adjustment for On-Peak Power Output Benefit of Distributed PV would be Sufficient Price to Assure Rapid Construction of 400 MW Distributed PV Alternative to ISEGS

The MPR that renewable energy projects are currently compared to, the cost of power generation from a hypothetical new natural gas-fired baseload power plant, is $0.12126/kWh.[41] Solar PV produces a substantial amount of output during on-peak summer demand periods. The electric power tariff during summer on-peak periods is much higher than the average tariff over the course of a year. For example, SCE's tariff pays 3.13 times the base MPR for deliveries during the summer on-peak period.[42] SCE has determined that the adjusted MPR for a distributed PV system is 1.39 times the MPR for a baseload plant.[43] Multiplying the $0.12126/kWh MPR by 1.39 gives an adjusted MPR of $0.169/kWh. This price alone, based on my experience with the current pricing of distributed PV PPAs, may be a sufficient price signal for private developers to rapidly develop large-scale distributed PV in SCE and PG&E service territories.

However, the transmission & distribution benefits of distributed PV are real and have been quantified.[44] The estimated value range of the transmission and distribution benefits of distributed PV include $0.058/kWh in SDG&E territory and $0.023 to $0.037/kWh in SCE territory. The transmission & distribution benefits of distributed PV in PG&E territory vary widely. Some examples in PG&E territory include Fresno at $0.026/kWh and Stockton at $0.039/kWh. These estimates were developed using the E3 model for calculating transmission & distribution benefits.[45]

An MPR-adjusted price of $0.169/kWh, plus an average transmission & distribution benefit of approximately $0.030/kWh, is equivalent to an overall value to the IOU of approximately $0.20/kWh. Any price paid for distributed PV by an IOU below this price threshold should result in a net benefit to all of the IOU's ratepayers. A distributed PV price in the range $0.20/kWh would be more than sufficient to create a dynamic market for third party development of large-scale distributed PV in California urban areas.

G. Retrofitting Commercial PV onto Existing Rooftops Makes It More Cost-Effective, Not Less So as Implied in the FSA

The FSA implies that retrofitting PV onto existing buildings makes rooftop PV cost-prohibitive, stating "Widespread expansion of distributed PV beyond current programs, however, would require a large number of retrofit installations. No matter how it is installed, relying heavily on PV greatly increases the total cost of meeting state renewable energy and GHG targets." This implication against retrofit PV installations is completely wrong. Commercial rooftops offer ideal platforms for large-scale PV and require minimal site preparation compared to ground-

---

[41] CPUC Resolution E-4214, *2008 Market Price Referent values for use in the 2008 Renewable Portfolio Standard solicitations*, December 18, 2008. MPR, 2012 operational date, 20-yr PPA: $0.12126/kWh.
[42] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Supplemental Rebuttal Testimony*, October 14, 2008, p. 3, footnote 2. "ToD (time of day) adjustment estimate calculated as weighted average of (512 summer – on hours at 3.13, 768 summer – mid at 1.35, and 2,189 winter – mid hours at 1.00) = 1.39."
[43] Ibid.
[44] CPUC Rulemaking R.06-02-012, Develop Additional Methods to Implement California RPS Program, *Pre-Workshop Comments of GreenVolts, Cleantech America, and Community Environmental Council on the 2008 Market Price Referent*, March 6, 2008, p. 15.
[45] Ibid, p. 14.

mounted PV or power tower projects like ISEGS. The entire SCE urban PV project, at $3,500/kW$_{dc}$, is based on putting PV on existing commercial rooftops. The SCE estimated labor cost of $0.60/watt$_{dc}$ is low precisely because relatively little site preparation is required.[46]

Some utilities are already prioritizing the distributed PV alternative. The November 2008 Los Angeles Department of Water & Power "Solar Los Angeles" strategic plan is a good real-world example of this focus.[47] The plan consists of 780 megawatts of urban PV and 500 megawatts of remote solar. This is approximately 60 percent distributed PV and 40 percent remote solar. In contrast, the 33 percent RPS reference case evaluated by the CPUC, the case that assumes the renewable energy contracts signed by the IOUs proceed on schedule, includes 3,235 MW of distributed PV and 7,298 MW of remote solar thermal of all types.[48] This is approximately 30 percent distributed PV and 70 percent remote solar including ISEGS.

H. FSA Concerns about Sufficient PV Panel Manufacturing Capacity Are Baseless

The concerns expressed in the FSA regarding the availability of PV panels if 400 MW of distributed PV substitutes for ISEGS are without foundation. More than 5,000 MW of PV was installed worldwide in 2008.[49] Worldwide thin-film PV production capacity reached 3,600 MW per year in 2008. The FSA cites an incorrect and unreferenced manufacturing capacity for thin-film PV of 500 MW per year in 2008 (FSA, p. 4-66). Thin-film PV manufacturing capacity is projected to reach 7,400 MW per year in 2010. First Solar alone has manufactured and shipped more than 1,000 MW of thin-film panels to date in 2009.[50]

Worldwide conventional polycrystalline silicon PV production capacity reached 13,300 megawatts a year in 2008.[51] It is projected to reach 20,000 megawatts a year in 2010. The 2010 projections were made just as the economic slump began in late 2008. It is likely there will be some scale-back on the 2010 capacity additions due to the state of the world economy. Nonetheless, there is a tremendous amount of available worldwide PV manufacturing capacity.

PV panel manufacturing capacity has greatly expanded worldwide in the last 2 to 3 years. The current estimated oversupply of PV panel manufacturing capacity for 2010 is 8,000 MW.[52] As a result of this oversupply, the cost of conventional polycrystalline PV panels has dropped precipitously and is approaching the cost of thin-film PV panels. The *Wall Street Journal* recently reported that conventional solar panel prices have fallen by $2 a watt since 2008, due to too much solar manufacturing capacity chasing too few solar projects.[53]

---

[46] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Testimony*, March 27, 2008, Table IV-5, p. 41. Total labor cost per 1 MW$_{dc}$ PV array estimated at $0.61/W$_{dc}$.
[47] See: http://mayor.lacity.org/stellent/groups/electedofficials/@myr_ch_contributor/documents/contributor_web_content/lacity_004982.pdf
[48] CPUC, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009, p. 87.
[49] Schreiber, D. - EuPD Research, *PV Thin-film Markets, Manufacturers, Margins*, presentation at 1st Thin-Film Summit, San Francisco, December 1-2, 2008.
[50] First Solar press release, *First Solar Becomes First PV Company to Produce 1GW in a Single Year*, December 15, 2009.
[51] Schreiber, D. - EuPD Research, *PV Thin-film Markets, Manufacturers, Margins*, presentation at 1st Thin-Film Summit, San Francisco, December 1-2, 2008.
[52] B. Murphy – Fulcrum Technologies, Inc., *The Power and Potential of CdTe (thin-film) PV*, presented at 2nd Thin-Film Summit, San Francisco, December 1-2, 2009.
[53] Wall Street Journal, *Darker Times for Solar-Power Industry*, May 11, 2009.

California added 158 MW of distributed PV in 2008 (FSA, p. 4-62). California is a relatively minor player on the world PV stage. Spain added approximately 2,500 MW of primarily distributed ground-mounted PV resources in 2008.[54] Spain has a smaller economy than California. Germany, approximately the same size as California and with considerably lower solar intensity, added approximately 1,500 MW of distributed PV resources in 2008 and will add at least 2,000 MW in 2009.[55] At either of the demonstrated Spanish or German PV installation rates, California could meet its entire renewable energy gap of either 45,000 or 50,000 GWh/yr by 2020. Worldwide PV manufacturing, either thin-film alone or thin-film and conventional polycrystalline silicon, could readily supply 2,500 megawatts a year of PV demand in California now.

I. Slight Reduction in Output from Distributed PV in Los Angeles, Central Valley, or Bay Area Is Offset by Transmission Losses from ISEGS to These Load Centers

The FSA implies that the superior solar intensity at the ISEGS location in the Mojave Desert is a substantive reason for eliminating distributed PV from consideration, stating:

> The location of the distributed solar PV would impact the capacity factor of the distributed solar PV. Capacity factor depends on a number of factors including the insolation of the site. Because a distributed solar PV alternative would be located throughout the state of California, the insolation at some of these locations may be less than in the Mojave Desert.

The solar insolation at the ISEGS site is about 10 to 15 percent better than the composite solar insolation for Los Angeles, the Central Valley, and Oakland.[56,57] However, the CEC estimates average transmission losses in California at 7.5 percent and peak transmission losses at 14 percent.[58] The incrementally better solar insolation at the ISEGS site is almost completely negated by the losses incurred by transmitting ISEGS solar power to California urban areas. In contrast, distributed PV has minimal losses between generation and user.

---

[54] PV Tech, *Worldwide photovoltaics installations grew 110% in 2008, says Solarbuzz*, March 16, 2009.
[55] PV Tech, *German market booming: Inverter and module supplies running out at Phoenix Solar*, November 15, 2009.
[56] U.S. DOE, *Stand-Alone Flat-plate Photovoltaic Systems: System Sizing and Life-Cycle Costing Methodology for Federal Agencies*, 1984, Appendix, p. A-27.
[57] NREL, *Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors*, California cities data: http://rredc.nrel.gov/solar/pubs/redbook/PDFs/CA.PDF
[58] E-mail communication between Don Kondoleon, manager - CEC Transmission Evaluation Program, and Bill Powers of Powers Engineering, January 30, 2008.

J. CEC Has Already Determined Distributed PV Can Compete Cost-Effectively with Other Forms of Generation

The CEC denied an application for a 100-megawatt natural-gas-fired gas turbine power plant, the Chula Vista Energy Upgrade Project (CVEUP), in June 2009 in part because rooftop solar PV could potentially achieve the same objectives for comparable cost.[59]

This June 2009 CEC decision implies that any future applications for gas-fired generation in California, or any other type of generation including remote utility-scale renewable energy generation like ISEGS that require public land and new transmission to reach demand centers, should be measured against using urban PV to meet the power need. The CEC's final decision in the CVEUP case stated:[60]

> Photovoltaic arrays mounted on existing flat warehouse roofs or on top of vehicle shelters in parking lots do not consume any acreage. The warehouses and parking lots continue to perform those functions with the PV in place. (Ex. 616, p. 11.)….Mr. Powers (expert for intervenor) provided detailed analysis of the costs of such PV, concluding that there was little or no difference between the cost of energy provided by a project such as the CVEUP (gas turbine peaking plant) compared with the cost of energy provided by PV. (Ex. 616, pp. 13 – 14.)….PV does provide power at a time when demand is likely to be high—on hot, sunny days. Mr. Powers acknowledged on cross-examination that the solar peak does not match the demand peak, but testified that storage technologies exist which could be used to manage this. The essential points in Mr. Powers' testimony about the costs and practicality of PV were uncontroverted.

The CEC concluded in the CVEUP final decision that PV solar arrays on rooftops and over parking lots may be a viable alternative to the gas turbine project proposed in that case, and that if the gas turbine project proponent opted to file a new application a much more detailed analysis of the PV alternative would be required.

IV. Conclusion

The FSA analysis of the distributed PV alternative to ISEGS has many parallels to the FSA analysis of the distributed PV in the CVEUP proceeding. Flawed logic and outdated data were used to improperly eliminate distributed PV as an alternative. In fact, distributed PV is a fully viable and cost-effective alternative that eliminates the environmental impacts that would be caused by the ISEGS project. The FSA should have concluded that distributed PV is a superior alternative to the ISEGS project.

---

[59] CEC, Chula Vista Energy Upgrade Project - Application for Certification (07-AFC-4) San Diego County, *Final Commission Decision*, June 2009.
[60] Ibid, pp. 29-30.

From: Joan Taylor <palmcanyon@mac.com>
To: <CAPSSolarPalen@blm.gov>, <CAPSSolarNextEraFPL@blm.gov>, <CAPSSolarBlyth...
CC: <Holly_Roberts@blm.gov>
Date: 12/23/2009 2:24 PM
Subject: Fwd: 4th set, attachment, Joan Taylor

Begin forwarded message:

> From: Joan Taylor <palmcanyon@mac.com>
> Date: December 21, 2009 4:47:47 PM PST
> To: DRECP@blm.gov
> Subject: 4th set, attachment, Joan Taylor
>
>
>
> Begin forwarded message:
>
>> From: Bill Powers <bpowers@powersengineering.com>
>> Date: December 21, 2009 2:40:26 PM PST
>> To: Joan Taylor <palmcanyon@mac.com>
>> Subject: table comparing cost-of-energy of DG PV, remote wind and
>> remote solar thermal
>>
>> Joan,
>>
>> Below is my current comparative chart on cost. - Bill
>>
>>
>> The comparative cost-of-energy (COE) of state-of-the-art
>> distributed thin-film PV without a transmission penalty to remote
>> wind or solar power with a transmission penalty is a necessary
>> comparison in order to properly prioritize renewable energy
>> Date: December 21, 2009 2:40:26 PM PST
>> To: Joan Taylor <palmcanyon@mac.com>
>> Subject: table comparing cost-of-energy of DG PV, remote wind and
>> remote solar thermal
>>
>> Joan,
>>
>> Below is my current comparative chart on cost. - Bill
>>
>>
>> The comparative cost-of-energy (COE) of state-of-the-art
>> distributed thin-film PV without a transmission penalty to remote
>> wind or solar power with a transmission penalty is a necessary
>> comparison in order to properly prioritize renewable energy
>> resources on an economic basis. As shown in Table 1, when the
>> transmission penalty for remote wind power is included, the cost-of-
>> energy range for remote wind power and state-of-the-art thin-film
>> PV is about the same. In addition, a "value of power" component
>> would be necessary to account for the considerably higher average
>> value of solar power over the course of a year compared to wind
>> power. The reason for the higher value of power is that the solar
>> resource is very productive during the summertime onpeak demand
>> period when the price of power is much higher than at other times
>> of the year. In contrast, little wind power is produced during the
>> summertime onpeak demand period. The value of distributed PV is in
>> the range of 40 percent greater than the average value of wind
>> power. A knowledgeable investor will select distributed PV over
>> wind power if that investor is responsible for all the costs

>> Table 1. COE & "value of power" comparison: DG PV, remote solar
>> thermal, remote wind
>> Source of data
>> Cost-of-energy, distributed fixed thin-film PV
>> ($/MWh)
>> Cost-of-energy, remote solar thermal ($/MWh)
>> Cost-of-energy, remote onshore wind
>> ($/MWh)
>> RETI Phase 1A (Table 1-1) and Phase 1B final (Table 6-3) reports
>> 114 to 176
>> 143 to 192
>> 59 to 128
>> Transmission penalty, remote intermittent generation, $52/MWh,1
>> CPUC June 2009, preliminary analysis compliance with 33% by 2020
>> (E3 "Assumptions" supporting document, p. 5)
>> +0
>> +52
>> +52
>> COE of distributed PV and remote solar thermal and remote wind
>> adjusted for transmission penalty
>> 114 to 176
>> 195 to 244
>> 111 to 180
>>
>> Relative value of solar power versus wind power2
>> Crossborder Energy, June 2009 analysis re AB 560 (see Attachment C)
>> 1.39
>> 1.39
>> 1.0
>> 1) RETI Phase 1A (Table 1-1) assumes a capacity factor for tracking
>> solar PV of 25 to 30% and a capacity factor for onshore wind of 25
>> to 40%. However, the average measured capacity factor for Southern
>> California's two biggest wind development areas (Tehachapi and San
>> Gorgonio) in 2004-2005 (most recent data available) is
>> 114 to 176
>> 195 to 244
>> 111 to 180
>>
>> Relative value of solar power versus wind power2
>> Crossborder Energy, June 2009 analysis re AB 560 (see Attachment C)
>> 1.39
>> 1.39
>> 1.0
>> 1) RETI Phase 1A (Table 1-1) assumes a capacity factor for tracking
>> solar PV of 25 to 30% and a capacity factor for onshore wind of 25
>> to 40%. However, the average measured capacity factor for Southern
>> California's two biggest wind development areas (Tehachapi and San
>> Gorgonio) in 2004-2005 (most recent data available) is
>> approximately 28 percent each. See: http://wprs.ucdavis.edu/
>> 2) This comparison assumes that the annual average value of wind
>> power is equal to the average value of electricity over the course
>> of the year. This assumption works in favor of wind power, as it is
>> typically much less available in SoCal during peak demand periods
>> when electricity prices are highest than in off-peak periods when
>> electricity prices are at their lowest. I (Bill Powers) am
>> analyzing the average value of SoCal wind power and will update
>> this comparison chart when that analysis is complete.
>>
>

Please note my new email address: palmcanyon@mac.com
If you haven't done so yet, please delete my old address and add my

From: Joan Taylor <palmcanyon@mac.com>
To: <CAPSSolarBlythe@blm.gov>, <CAPSSolarNextEraFPL@blm.gov>, <CAPSSolarPale...
CC: <Holly_Roberts@blm.gov>
Date: 12/23/2009 2:25 PM
Subject: Fwd: 5th set, attachment, Joan Taylor

Begin forwarded message:

> From: Joan Taylor <palmcanyon@mac.com>
> Date: December 21, 2009 4:58:06 PM PST
> To: DRECP@blm.gov
> Subject: 5th set, attachment, Joan Taylor
>
>

Please note my new email address: palmcanyon@mac.com
If you haven't done so yet, please delete my old address and add my
new email address to your address book. Thanks.

new email address to your address book. Thanks.

In Our Backyard

How to Increase Renewable Energy Production on Big Buildings and Other Local Spaces

December 2009

Bank of America
Bank of Opportunity®

BerkeleyLaw
UNIVERSITY OF CALIFORNIA
Center for Law, Energy & the Environment

UCLA LAW
UCLA ENVIRONMENTAL LAW CENTER
EMMETT CENTER ON CLIMATE CHANGE AND THE ENVIRONMENT

About this Report

This policy paper is the second in a series of reports on how climate change will create opportunities for specific sectors of the business community and how policy makers can facilitate those opportunities. Each policy paper results from one-day workshop discussions that include representatives from key business, academic, and policy sectors of the affected industries. The workshops and resulting policy papers are sponsored by Bank of America and produced by a partnership of the UC Berkeley School of Law's Center for Law, Energy & the Environment, UCLA School of Law's Environmental Law Center & Emmett Center on Climate Change and the Environment, and the California Attorney General's Office.

Authorship

The primary author of this policy paper is Ethan N. Elkind, Bank of America Climate Change Research Fellow for UC Berkeley School of Law's Center for Law, Energy & the Environment (CLEE) and UCLA School of Law's Environmental Law Center & Emmett Center on Climate Change and the Environment.

Additional contributions to the report were made by Richard Frank and Steven Weissman of the UC Berkeley School of Law and Sean Hecht and Cara Horowitz of the UCLA School of Law.

Acknowledgments

The author and organizers are grateful to Bank of America for its generous sponsorship of the workshop series and input into the formulation of both the workshops and the policy paper. We would specifically like to thank Anne Finucane, Global Chief Strategy and Marketing Officer, and Chair of the Bank of America Environmental Council, for her commitment to this work.

We thank Ken Alex, Sandra Goldberg, and Cliff Rechtschaffen of the California Attorney General's Office, and Bill Powers, P.E. of Powers Engineering for helping to edit this report.

In addition, we are grateful to Claire Van Camp of the UC Berkeley School of Law for her hard work behind the scenes on the workshop and this policy paper. We also thank Steven Weissman for facilitating the workshop.

Finally, the UC organizers, together with the California Attorney General's Office, gratefully acknowledge R. Gregg Albright, Ken Baker, Obadiah Bartholomy, Julie Blunden, Dave Brennan, Joe Desmond, Mark Freyman, Richard Gruber, Fran Inman, Mike Kimball, Jay Knoll, Craig Lewis, Eric Lundquist, Wally McOuat, Neal Skiver, Robyn Uptegraff, and Case van Dam for their insight and commentary at the June 5, 2009 Climate Change Workshop that informed this analysis.

For more information, contact Ethan Elkind at Eelkind@law.berkeley.edu or (510) 643- 3701.

Bank of America
Bank of Opportunity

BerkeleyLaw
UNIVERSITY OF CALIFORNIA
Center for Law, Energy & the Environment

UCLA LAW
UCLA ENVIRONMENTAL LAW CENTER
EMMETT CENTER ON CLIMATE CHANGE AND THE ENVIRONMENT

Executive Summary: Clean Energy from Big Buildings and Other Local Spaces

In California's effort to combat climate change, few other sectors present as many opportunities as renewable energy. Transitioning from fossil-fuel based energy to renewable sources will result in significant greenhouse gas reductions and more jobs and economic growth.[1] And with its abundant wind, solar, and geothermal resources, California is well-situated to capitalize on this effort. While the state has developed programs to promote small-scale renewable energy options, such as solar photovoltaic panels on individual homes and small businesses, much of the political and legislative effort for increasing renewables has focused on large-scale, centralized wind and solar developments, usually located far from the majority of energy consumers. Many of these proposed developments require new, expensive transmission lines and face significant land-use and related hurdles. Siting and construction will take years.

But climate change and the state's aggressive renewable energy requirements (mandating that renewable energy sources constitute 20 percent of electrical power for the state by 2010 and 33 percent by 2020) require immediate action. As a result, there is considerable interest in installing renewable energy technology on the rooftops of large commercial and government buildings, and in other spaces such as wastewater treatment plants, the aqueduct, and highway rights-of-way. Many of these systems could be considerably larger than the small-scale solar panels on individual homes while still allowing the power to be generated close to the customers using it. This type of decentralized electricity production is a critical alternative and complement to large-scale renewable developments. It represents the single most immediate and feasible means to produce renewable energy on a broad scale without reliance on long-distance transmission lines, some of which have yet to be built.

Decentralized renewable energy generation represents the single most immediate and feasible means to produce renewable energy at a broad scale without reliance on long-distance transmission lines, some of which have yet to be built.

Unfortunately, decentralized energy generation also faces financing and regulatory barriers. State incentive programs need improvement, such as net metering, which allows renewable energy generators to offset their electricity bills with credits from the energy they provide to the grid; and the feed-in tariff, which provides cash payments for renewable energy.

To address these barriers and formulate solutions, a group of leading renewable energy suppliers, policy advocates, public agency leaders, and large private company representatives met at the UC Berkeley School of Law in June 2009. The group identified and prioritized the most critical barriers to promoting widespread decentralized generation on large buildings and other local spaces that are sometimes in our own backyard. Based on that discussion, this paper identifies the immediate and longer-term actions that government leaders, private industry, and public agencies must take to address the barriers. *The key finding is that policy makers must expand and improve the net metering and feed-in tariff incentive programs.*

Top Four Barriers to Decentralized Renewable Energy Production on Big Buildings and Other Local Spaces

1) Lack of Predictable and Adequate Financing

Current state and federal policies provide inadequate financing for the high upfront costs of installing large renewable arrays like solar panels and wind turbines.

2) Uncertain Government Permitting and Regulatory Programs

Uncertainty about existing and potential energy and climate change programs, as well as an unpredictable and complicated permitting process, discourages building owners and operators from investing in renewable energy.

3) Lack of Education and Outreach

Many businesses and public agencies are unaware of the opportunities to place renewable energy systems on their buildings and are sometimes reluctant to invest under the assumption that prices will continue to decline.

4) Landlord/Tenant Split Incentives

Commercial and multifamily residential property owners have little incentive to install renewable energy arrays that will lower energy costs for their tenants but not for them, while tenants lack incentive to invest in renewable energy technology for a rental property that they may vacate before they see a return on the investment.

Short and Long-Term Solutions

Federal Government

Ensure that renewable energy tax incentives can be applied efficiently to public properties, such as schools and government buildings.

Consider creating a "Green Bank" that would extend federal loan guarantees to renewable energy projects.

Strengthen state net metering programs, which allow property owners to offset their electricity bill with renewable energy generated on-site, by requiring states to allow utilities to meet a greater percentage of their peak load through the energy generated under the program and to increase the size limits of eligible renewable energy sources.

Amend the federal Public Utility Regulatory Policies Act (PURPA) to require states to enact policies that will result in expanded decentralized energy generation.

Amend PURPA to clarify that states are not preempted by federal law from establishing feed-in tariffs, which provide payments to owners of renewable energy generators for the electricity they feed into the grid.

Require the Federal Energy Regulatory Commission (FERC) to consider decentralized renewable energy generation as an alternative or as a complement to siting new transmission lines for renewable energy projects.

Require federal agencies to utilize, when possible, public buildings, including structures along rights-of-way, large offices, and other sizeable facilities with roof space and/or wind energy potential, for renewable energy generation.

Modify applicable procurement rules to encourage federal agencies to invest in renewable energy.

The federal government should require the Federal Energy Regulatory Commission (FERC) to consider decentralized generation as an alternative or as a complement to siting new transmission lines for renewable energy projects.

State Government

Strengthen and improve California's existing feed-in tariff program by expanding it to cover larger sources at a rate that will increase production without over-stimulating the market.

Allow owners of renewable energy systems to sell surplus electricity to more than two adjacent properties without facing regulation by the California Public Utilities Commission (CPUC) as a utility.

Modify the California Solar Initiative (CSI), a rebate program for purchasers of solar panels, to provide rebates for customers who sell excess energy to the utility.

Expand California's Renewable Energy Transmission Initiative (RETI) process to include decentralized renewable energy generation as a preferred alternative to new and large transmission-dependent renewable energy projects.

Improve the net metering program by raising the cap on the percentage of a utility's load that can be met through the renewable energy generated under the program and by increasing the size limit on eligible renewable energy sources.

Instruct state agencies to utilize, when possible, public spaces and buildings, including schools, structures along rights-of-way, highways, aqueducts, and other large facilities, for renewable energy generation.

Modify procurement processes and rules to encourage state agencies to invest in renewable energy.

Require utilities that lease commercial rooftop space for renewable energy installations to offer the property owners an option to share some of the costs and benefits.

Expand "virtual net metering" to allow multiple tenants in any type of building to receive proportional credit on their electricity bills for the renewable energy generated on-site.

Local Governments & Municipal Utilities

Develop a robust municipal utility feed-in tariff program that includes a payment plan that will increase production without over-stimulating the market.

State government should strengthen and improve California's existing feed-in tariff program by expanding it to cover larger sources at a rate that will increase production without over-stimulating the market.

Allow businesses and local public agencies to have access to municipal bond money to finance renewable energy investment.

Ensure that the permitting processes for renewable energy technology, including wind and solar, are simple and predictable and share best practices for permitting with other local governments.

Direct planners to consider renewable energy potential when they devise local land use codes, which could include encouraging greater sun exposure for the rooftops of new buildings in order to increase their ability to generate solar electricity.

Designate areas suitable for renewable energy development as part of the general plan update process.

Install decentralized renewable energy technology on public facilities that are owned and managed by local government.

Industry Leaders

Educate company salespeople, large building owners, and policy makers about the potential for siting large renewable energy generators on public and private roofs and other local spaces near energy consumers.

Educate businesses about the time-limited nature of existing federal and state tax credits to encourage immediate investment in renewable technology.

Simplify the process for financing and installing renewable energy technology for clients and educate them about the benefits of not waiting for future price reductions.

Conclusion

Heightened support for renewable energy at all levels of government indicates that the renewable power industry faces new opportunities and a potentially paradigm-shifting moment. But rather than wait for large renewable energy plants to become available, policy makers should strengthen existing laws and provide financing for decentralized renewable energy generation. Ultimately, this type of generation represents the best immediate hope to produce renewable energy at a broad scale, particularly given the likely delays facing the construction of new long-distance transmission lines. But it will take a combined effort of all levels of government and industry for decentralized renewable energy generation to reach its potential.

GLOSSARY OF TERMS

California Energy Commission (CEC): The state's primary energy policy and planning agency.

California Public Utilities Commission (CPUC): State agency that regulates investor-owned electric companies.

California Solar Initiative (CSI): The "Million Solar Roofs" rebate program that set a goal of securing 3,000 megawatts (MW) of solar-produced electricity by 2017.

Distributed Generation (DG): Electricity production that is on-site or close to the load center and is interconnected to the utility distribution system (also described as "decentralized generation").

Federal Energy Regulatory Commission (FERC): Agency with regulatory authority over transmission siting.

Feed-in Tariff (FiT) Requires the utility to pay a set amount for electricity generated from sources such as a rooftop solar system.

Investor-Owned Utilities (IOU): A privately-owned electric company that is regulated by the CPUC.

Municipal Utility: A political entity, such as city or county governments, that provides utility-related services such as electricity, water, and sewage.

Net Metering: State program allowing customers who have installed renewable energy technologies to use the energy generated to reduce their electricity bills, averaging the usage over the year.

Power Purchase Agreements (PPA): A third party owner/service provider receives tax benefits from installing a renewable technology array on a host's property and then passes those benefits on to the end-user/host in the form of lower energy costs over a contractually-arranged term.

Public Utility Regulatory Policies Act (PURPA): Federal legislation from 1978 designed to increase energy efficiency and alternative forms of energy production.

Qualifying Facilities: Small-scale or incidental producers of commercial energy who generate energy for their own needs but also produce a surplus of saleable electric energy pursuant to PURPA. Utilities have been required to purchase energy from these facilities at highly-favorable rates for the producer in order to encourage energy production from these facilities and to reduce dependence on other sources of energy.

Renewable Energy Transmission Initiative (RETI): Statewide interagency process to identify renewable energy zones that can be developed cost effectively and with the least environmental impacts. RETI also develops conceptual transmission plans for identified energy zones and the permitting processes for projects identified in RETI transmission plans.

Renewable Energy Credit (REC): A certificate of proof, issued through a state accounting system, that one unit of electricity was generated and delivered by an eligible renewable energy resource. A REC can be sold either "bundled" with the underlying energy or "unbundled" into a separate REC trading market, and utilities in California can use RECs to meet their RPS obligations.

Renewable Portfolio Standards (RPS): Legal requirements that a specific percentage of retail electrical power for the state come from renewable energy sources.

Why Decentralized Renewable Energy Matters

The impacts of climate change threaten California's economy, natural resources and quality of life.[2] As a result, the state, through legislation, regulation and executive orders, has acted to reduce the greenhouse gas emissions (GHG) that cause climate change. For example, the California Global Warming Solutions Act of 2006 (AB 32) mandates that the state roll back its GHG emissions to 1990 levels by the year 2020, equivalent to a 30 percent cutback from the business-as-usual scenario projected for 2020.[3] And California Governor Arnold Schwarzenegger's Executive Order S-3-05 calls for an 80 percent reduction from 1990 levels by 2050.[4]

The electricity and commercial/residential energy sector is collectively the second largest source of GHG emissions in California, contributing over 30 percent of the statewide GHGs (See Figure 1).[5] California's efforts to reduce aggregate GHG emissions will therefore require the state to reform this sector. Emissions reductions from energy use can result from two actions: first, reducing demand for energy through energy efficiency and/or conservation measures and second, switching from fossil fuel-based energy to renewable sources that do not contribute to GHGs emissions. This paper focuses on the second action and specifically on the opportunities for decentralized renewable energy generation on large buildings and other local spaces.

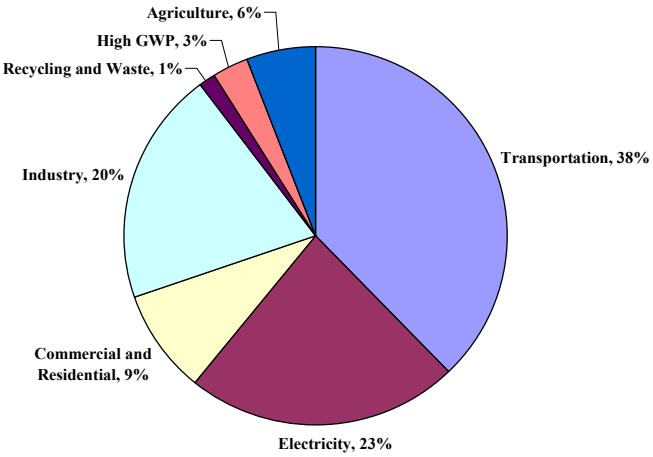


Figure 1. California's Greenhouse Gas Emissions
Source: California Air Resources Board

California has taken two major steps to encourage renewable energy generation. First, the state developed "renewable portfolio standards" (RPS) that require retail electricity sellers, with the exception of municipal utilities, to procure 20 percent of their electricity from eligible renewable energy resources by 2010.[6] The Governor issued Executive Order S-14-08 in November 2008 to increase the percentage to 33 percent by 2020 for all utilities.[7] In support of this goal, California Air Resources Board (CARB), charged with implementing AB 32, stated in its AB 32 scoping plan that achieving a statewide renewable energy mix of 33 percent by 2020 "is a key part of CARB's strategy for meeting the AB 32 targets."[8] The Governor also issued Executive Order S-21-09 on September 15, 2009, directing CARB to issue regulations to achieve the new standard.[9]

The second major step California has taken is the California Solar Initiative (CSI). In 2006, California enacted SB 1, called the "Million Solar Roofs" program, with the goal of securing 3,000 megawatts (MW) of solar-produced electricity by 2017. The legislation offers $3.35 billion in solar power incentives for existing residential homes and new commercial, industrial, and agricultural properties.[10]

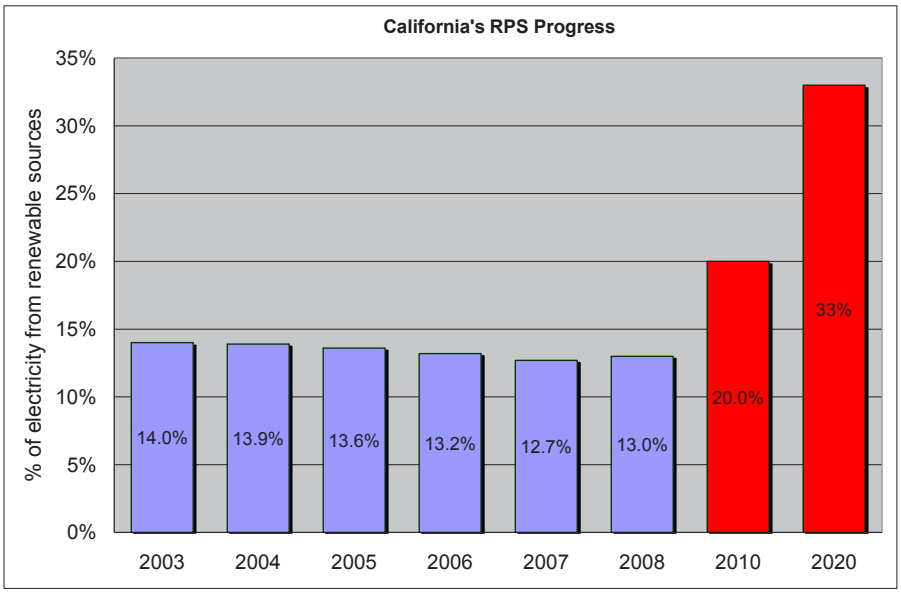


Figure 2. California's RPS Progress: Percentage of renewable energy from California's three largest investor-owned utilities (2010 and 2020 targets in red).

Electric utility customers pay for this program through their electricity rates. Its objective is to achieve a self-sustaining solar market by 2016. On average, CSI incentives are projected to decline at a rate of seven percent each year following its implementation in 2007.[11] The legislation therefore contains an incremental phase-out in the incentive payments over the duration of the CSI program.

California Utilities Will Likely Fail to Meet the RPS Goals on Time through Reliance on Large and Remote Central-Station Renewable Energy Sources

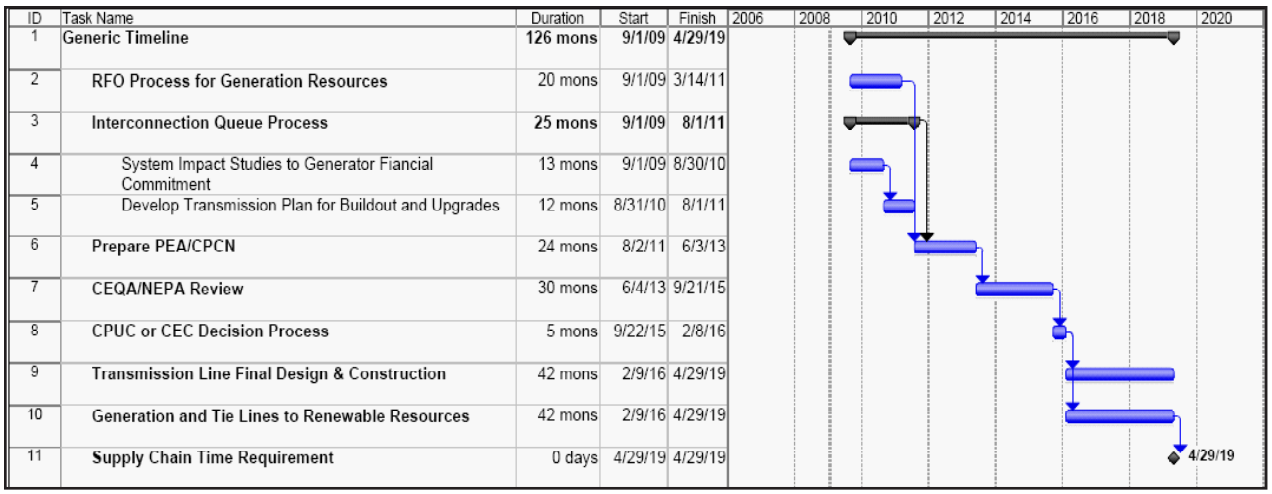
California's investor-owned utilities (IOUs) are not on pace to meet the RPS goals on time. From 2003 to 2008, the percentage of electricity sold by these utilities that came from eligible renewable sources actually declined from 14 percent to 13 percent (See Figure 2).[12] Even with new sources of renewable energy added to the system, increased growth in demand has outstripped this progress.[13]

IOUs have focused much of their efforts to meet the RPS goals on contracts with large, central-station renewable energy generators, such as massive concentrating solar plants in the Mojave Desert. Providing some of this power to the grid, however, requires building new, expensive transmission lines that face significant, multi-year permitting and siting challenges, considerable public opposition, and losses associated with transmitting electricity.[14] New transmission lines can take many years to build from conception to operation due to the regulatory and public review processes (See Figure 3).[15] The California Public Utilities Commission (CPUC) predicts that "to meet the current 20 percent RPS by 2010 target, four major new transmission lines are needed at a cost of four billion dollars," while meeting the 33 percent by 2020 RPS goals would require "seven additional lines at a cost of $12 billion."[16]

"SMUD [Sacramento Municipal Utility District] has been trying to get new transmission lines approved, but people are coming out in droves against it. We'll get two to three hundred people coming out from towns of that population size."

-- Obadiah Bartholomy
Sacramento Municipal Utility District

To help address transmission siting and permitting issues for renewable resources, the California Energy Commission (CEC), CPUC, California Independent System Operators (ISO), and municipal and investor-owned utilities have created the California Renewable Energy Transmission Initiative (RETI). Through this statewide interagency process, the agencies identify the areas with renewable energy potential that can be developed cost-effectively and with the least environmental impacts. RETI develops the conceptual transmission plans for identified energy zones and the permitting processes for projects identified in RETI transmission plans.[17] RETI also coordinates with the federal government, including large federal landowners such as the Bureau of Land Management, United States Forest Service, and the Department of Defense, as well as entities such as the Federal Energy Regulatory Commission (FERC), which has limited federal regulatory authority with respect to transmission siting. Because these projects carry big price tags and often engender fierce opposition, they are likely to face significant delays.



ID	Task Name	Duration	Start	Finish
1	**Generic Timeline**	**126 mons**	**9/1/09**	**4/29/19**
2	**RFO Process for Generation Resources**	20 mons	9/1/09	3/14/11
3	**Interconnection Queue Process**	**25 mons**	**9/1/09**	**8/1/11**
4	System Impact Studies to Generator Fiancial Commitment	13 mons	9/1/09	8/30/10
5	Develop Transmission Plan for Buildout and Upgrades	12 mons	8/31/10	8/1/11
6	**Prepare PEA/CPCN**	24 mons	8/2/11	6/3/13
7	**CEQA/NEPA Review**	30 mons	6/4/13	9/21/15
8	**CPUC or CEC Decision Process**	5 mons	9/22/15	2/8/16
9	**Transmission Line Final Design & Construction**	42 mons	2/9/16	4/29/19
10	**Generation and Tie Lines to Renewable Resources**	42 mons	2/9/16	4/29/19
11	**Supply Chain Time Requirement**	0 days	4/29/19	4/29/19

Figure 3. Source: Energy and Environmental Economics, Inc. report to the CPUC, January 15, 2009

Decentralized Generation Represents the Fastest and Most Reliable Option for Increasing Renewable Energy Supplies

Decentralized renewable energy generation, often called "distributed generation," represents a promising alternative and supplement to reliance on large central-station solar and wind plants and the attendant transmission challenges. The CEC defines distributed generation as "electricity production that is on-site or close to the load center and is interconnected to the utility distribution system."[18] Distributed generation is not limited to one type of technology or size category. Ironically, distributed generation was Thomas Edison's original vision for electricity production in the United States. But technical advancements made this system obsolete by enabling a substantial amount of power to be generated at large off-site plants and transmitted at high voltage to homes, where transformers reduced the voltage for consumer use.[19]

California utilities could likely exceed the amount of renewable power they need to meet the RPS requirements through expanded use of distributed generation. In a Public Interest Energy Research Program report to the California Energy Commission, the report's authors estimate that rooftop solar could provide 60,929 MW of electricity, equivalent to 128 to 213 percent of the amount of energy California will need from off-site renewable sources to meet the RPS requirements.[20] And the opportunities for locating distributed generation on rooftops are likely to expand in the future. In another study, Navigant found that the total roof space available for solar power in 2025 will be an estimated 84.5 billion square feet nationwide, compared to 62.4 billion square feet in 2003. The residential share is 53%.[21] These statistics do not include additional opportunities, such as along highways, aqueducts, and other large public and private buildings near electricity consumers, as well as commercial parking lots and ground-mounted solar systems.

Decentralized Renewable Energy Generation is Becoming More Cost-Effective as Technology Prices Decline

Critics note that decentralized renewable energy generation may involve relatively high costs compared to central-station solar. The CPUC, for example, estimates that by 2020, if the state relied heavily on decentralized generation for renewable power to meet the RPS targets (the "high distributed generation" case), the cost would be $58 billion, compared to $54.2 billion for exclusively large central-station solar. This differential represents a seven percent cost

premium for decentralized generation over central-station solar (although the agency acknowledges that large central station solar may entail unforeseeable costs from public opposition and legal challenges, risks from relying on the new technologies involved in central-station solar, and financing difficulties).[22]

The CPUC cost projections for solar photovoltaic (PV) distributed generation panels, however, appear to be outdated and unduly pessimistic. In its study, the CPUC based its cost data on polycrystalline silicon solar PV technology and not thin-film solar panels, a distinct and less-expensive technology. Published data on the cost of thin-film panels by manufacturer First Solar indicates that the current production cost is $3.50 per watt,[23] exactly half of the CPUC's installed cost estimate of seven dollars per watt.[24] And based on a 2008 renewable energy deal between PG&E and Sempra Generation for 10 MW of thin-film PV,[25] distributed PV generation at this scale may already be cost-competitive with, or possibly cheaper than, large central-station solar. Even for polycrystalline silicon, the CPUC's seven dollar per watt figure (based on a 2007 price) is significantly higher than the CEC's identified 2009 installed cost of polycrystalline silicon PV as $4.55 per watt for installations up to 25 MW in size.[26] Moreover, the CPUC assumes that two-thirds of the distributed PV will be remotely located and will require new transmission at a cost equivalent to a remote central-station wind or solar project.[27] This assumption contradicts the generally-understood definition of distributed PV and adds an extra one billion dollars per year in transmission costs to the "high distributed generation" case.

California's attempts to capitalize on decentralized generation opportunities have shown promise but are limited by institutional barriers. The two primary programs promoted by the state have had limited success to date: net metering and feed-in tariffs.

California Must Improve its Decentralized Renewable Energy Generation Policies

California's attempts to capitalize on decentralized generation opportunities have shown promise but are limited by institutional barriers. The two primary programs promoted by the state have had limited success to date: net metering and feed-in tariffs. Net metering allows participating customers with renewable energy systems on their properties to receive a credit on their electricity bill for the electricity that they generate and feed back to the utility. The billing cycle covers a calendar year, so a customer can bank the benefit of excess power generated during periods of low usage and apply it later in the year when the customer generates less than he or she consumes. In this system, the utility does not pay the customer for any electricity produced beyond the customer's own needs (AB 920 [Huffman], signed into law on October 11, 2009, will require utilities to purchase a limited amount of surplus electricity under net metering in order to encourage on-site energy efficiency). Electric service providers must make net metering available to customers until the amount of electricity generated in the provider's area under the program meets the "net metering cap," which is a percentage of each utility's peak demand.[28] SB 1, the legislation creating the California Solar Initiative in 2006, raised the net metering cap to 2.5 percent.[29]

Net metering suffers from some critical legal limitations. First, most renewable energy advocates agree that the cap is too low (some investor-owned utilities may reach the cap in 2010).[30] Of the 44 states that offer net metering, 18 have entirely eliminated the cap on total net energy metered capacity. AB 560 (Skinner), debated in 2009 in Sacramento and now tabled until 2010, proposed to raise this limit to five percent. Second, the program currently limits the size of eligible renewable generation systems to one MW, which prevents some large-scale customers from participating in the program.[31]

Net metering also faces inherent limitations on its ability to promote widespread decentralized generation. Because customers only see financial benefits

under the program from reductions in their on-site electricity bill, the on-site usage becomes a de facto cap on how much a customer is willing to invest in renewable energy technology. For example, the owner of a large building with ample roof space but low on-site energy consumption is unlikely to invest in significant rooftop renewables. The owner's electricity bill in these situations is simply not high enough to generate savings to offset the upfront cost. The same limitation is true for any owner of an energy efficient building (although AB 920, referenced above, may ameliorate this problem). And the renewable energy generated under net metering does not count toward meeting each utility's RPS obligation.[32] Therefore, any increase in renewable energy generated under net metering will not help the state meet its RPS goals.

California's feed-in tariff represents the state's second effort to stimulate decentralized renewable energy generation. At its simplest, a feed-in tariff requires the utility to pay a set amount for electricity generated, such as from rooftop solar systems. Feed-in tariffs can provide eligible generators with a predictable revenue stream over a specific term. In Germany, the feed-in tariff payment rate declines over time to provide an initial market stimulation that then decreases as the cost of solar panels declines. The interconnecting utility usually offers the feed-in tariff and sets the price. The tariffs may vary depending on the type of renewable technology, resource quality, or project size, and they may decline on a set schedule over time.[33] Unlike net metering, the feed-in tariff provides "wholesale distributed generation," in which the electricity generated feeds directly into the grid, as opposed to "retail distributed generation," in which the electricity generated stays "behind the meter" and offsets a consumer's retail electricity bill.

At its simplest, a feed-in tariff requires the utility to pay a set amount for electricity generated, such as from rooftop solar systems. The tariffs may vary depending on the type of renewable technology, resource quality, or project size, and they may decline on a set schedule over time.

The current California feed-in tariff applies to facilities up to 1.5 MW in size (equivalent to one large wind turbine), and the state caps the overall amount of electricity that utilities can purchase under this program at 500 MW.[34] SB 32, signed into law on October 11, 2009, raises the size limit to three MW and the statewide cap to 750 MW.[35] Critics complain, however, that the program provides inadequate incentives to stimulate market activity because the prices paid to generators would not reflect the cost of generation. They also contend that the 1.5 MW maximum should be raised to 20 MW to allow more projects to qualify for the payments.[36] In August 2009, the CPUC introduced a feed-in tariff proposal that would require utilities to purchase one GW of electricity from renewable sources up to ten MW in size. The utilities would auction the rights to provide the power to bidders who could offer the lowest contract payment rates.[37]

Meanwhile, federal agencies like FERC are oriented more toward facilitating transmission for large, central-station renewable plants rather than supporting and strengthening state programs to encourage decentralized generation. As a result, both the state and federal governments presently have a significant opportunity to reorient the focus of renewable energy programs to encourage the production of decentralized generation on large public and private buildings and other spaces that are sometimes literally in our backyard.

Participants at the June 2009 workshop at UC Berkeley identified and prioritized the most significant barriers to decentralized renewable energy generation on large public and private buildings and other spaces near electricity consumers. This report presents a guide for industry leaders and policy makers at all levels of government to remove the barriers to, and facilitate, decentralized generation on these sites.

Barrier # 1: Lack of Predictable & Adequate Financing

Solar panels and other renewable arrays require high upfront costs. But the current economic downturn has depleted many available sources of capital, and the public sector currently fails to provide enough investments in the payments, loans and tax credits necessary to establish a cost-competitive renewable energy industry. When businesses do have access to capital, they are unlikely to use it to invest in low-yield renewable technology when they may have core business needs to invest in that could yield higher returns.

SOLUTION: Improve and Expand Existing Financial Incentive Programs
Part of the solution depends on how quickly the economy can rebound to provide more capital for businesses to invest in renewable technology. But in the meantime, potential renewable energy investors, from public agencies to private businesses, need loan and tax credit programs that have certainty and applicability over the life of the project and that will make the investment reasonably certain to yield a profit. These programs should be more robust in the near term, with declining long-term incentives, in order to build the scale and innovation necessary to make renewable energy cost-competitive with fossil-fuel based energy. A comprehensive feed-in tariff would also stimulate greater demand for renewable energy, which would provide more revenue to suppliers. As one workshop participant stated, we need to get to the point with renewable energy technology where "you'd be stupid not to buy."

"Right now we're constrained to fit the technology to the financing opportunities. I prefer that we clean up the tax code to make it more efficient, so we're fitting the financing to the commercial reality."

-- Eric Lundquist
Banc of America Leasing

Federal Government

Ensure that renewable energy tax incentives can be applied efficiently to public properties. Public entities like schools cannot benefit directly from federal tax incentives for renewables because they are tax-exempt entities and are therefore disqualified under existing law. As a result, the best financing option for these public institutions is to enter into a power purchase agreement (PPA) with an investor/owner and typically a third party operator. The investor/owner receives the available tax benefits for the installed renewable technology and utilizes those federal incentives to provide the end-user (in this case, the public institution) with lower overall energy costs under the PPA. Currently, however, many large financial institutions are reluctant to invest in PPA deals due to uncertainty about the federal tax treatment of these transactions. To encourage widespread investment in PPA arrangements, the Internal Revenue Service could issue a "Revenue Procedure" that defines the acceptable structure and terms for solar financing under a PPA, similar to Revenue Procedure 2007-65, which defined a "safe harbor" structure for wind partnership transactions in 2007. The result would likely be increased investment in PPA arrangements that would boost decentralized generation across California and the nation.

Consider creating a federal "Green Bank" that would extend federal loan guarantees to renewable energy projects. Existing federal loan guarantees and tax incentives may not be sufficient to provide adequate financing given the scale of the renewable energy needs in the country.

State Government

Strengthen and improve the feed-in tariff program by expanding it to cover larger sources at a rate that will increase production without over-stimulating the market. Sources from 3.0 to 20 MW currently are not covered by the feed-in tariff program. A new feed-in tariff should allow these sources to receive payments from the utilities for their energy contributions to the grid. With an adequate price offering, the certainty of the payment structure under a feed-in tariff, coupled with the fact that a feed-in tariff provides actual cash payments as opposed to electric bill credits, would encourage more property owners to invest in renewable technology. California should ensure, however, that an expanded feed-in tariff does not replicate the problems suffered by Spain. That country devised a very generous feed-in tariff regime that over-stimulated production well beyond the target established by the Spanish government. In response, the government had to drastically decrease the tariff rate and target, resulting in a significant drop-off in solar panel purchases. By contrast, the German feed-in tariff program has been more successful, in part due to payment options that more closely track market conditions.[38] A California feed-in tariff program should therefore set strict capacity minimums and limits to avoid creating a PV installation "boom and bust" cycle that would destabilize the market.

Allow owners of renewable energy systems to sell surplus electricity to more than two adjacent properties without facing regulation by the CPUC as a utility. Currently, the CPUC regulates as a utility any owner of a renewable energy system who sells that energy to more than two users on adjacent properties. The owner can sell the energy to a maximum of two neighbors who are located "over the fence" from the owner's property but not across the street or separated by another property.[39] The legislature should increase this number to increase the profit potential for renewable investors and therefore stimulate more private financing for decentralized generation.

Local Government & Municipal Utilities

Allow businesses and local public agencies to have access to municipal bond money to finance renewable energy investments. This local bond money would provide yet another source of financing for renewable energy projects.

Develop a municipal utility feed-in tariff program that covers large sources at a rate that will increase production without over-stimulating the market. Municipal utilities, such as the Los Angeles Department of Water and Power, have the authority to develop their own feed-in tariff programs in the absence of state and federal legislation to the contrary. These local government entities should implement an effective feed-in tariff program to stimulate more renewable energy production locally.

Barrier # 2: Uncertain Government Permitting & Regulatory Programs

Businesses and large agencies crave certainty in both costs and processing time. But they face uncertainty over the permitting process and how state renewable portfolio standards will be affected by the potential state or federal cap-and-trade program and AB 32 regulations. They also are unsure how they can benefit from proposed state and federal renewable energy programs. For example, under the proposed state and federal cap-and-trade programs, businesses that fall under the government "cap" on GHG emissions may be able to purchase credits for GHG reductions that occur elsewhere. These "offsets" might take the form of investment in renewable energy installations on large buildings owned by other companies. Therefore, potential private owners of decentralized generation technologies may want to delay investment with the hope that they might become eligible for funding (essentially free money) from a business looking to purchase offset credits. Meanwhile, complicated and burdensome permitting procedures have discouraged building-owners and operators from installing renewable energy arrays.

"A farmer who is looking at renewables should be able to go to the county and get a straightforward path to the permitting requirements. It needs to be time-predictable, transparent, fair, and with straightforward costs."

-- Case van Dam
U.C. Davis & California Wind Energy Collaborative

SOLUTION: Improve Existing Incentives for Decentralized Generation

In order to stimulate businesses to invest in renewable energy despite the uncertainties and regulatory burdens, the state and federal government must act to stimulate decentralized generation by strengthening and expanding existing incentive programs. The federal government can encourage and improve state programs, such as the feed-in tariff and net metering. In California, state incentive programs should more effectively promote large-scale decentralized generation. Local governments, meanwhile, should streamline the permitting process.

Federal Government

Amend the federal Public Utility Regulatory Policies Act (PURPA) to require states to enact policies that will expand the use of decentralized renewable generation. Such policies include improvements to state net metering programs and introduction of feed-in tariffs. Enacted in 1978, PURPA encourages increased energy efficiency and alternative forms of energy production; states are responsible for implementation.

"One of the reasons the private sector hasn't jumped in with both feet is the uncertainty about how a solar project is going to be value-certified under AB 32 implementation."

-- Fran Inman
Majestic Realty Co.

Strengthen net metering programs in the states by requiring utilities to meet a greater percentage of their peak load from renewable distributed generation. Some net metering programs, like California, contain caps on the total amount of renewable energy generation that the program will cover and on the size of the sources providing the renewable energy. The federal government should require states to remove these limits in order to expand decentralized generation opportunities.

Clarify that states are not preempted from establishing feed-in tariffs. The Federal Power Act grants FERC exclusive jurisdiction to regulate the sale of wholesale power in interstate commerce. PURPA allows states a limited role in wholesale power markets by giving them authority to set utility "avoided cost rates" for wholesale power that utilities purchase from special FERC-approved qualifying facilities.[40] The extent of states' authority to set feed-in tariffs is not entirely clear under the

law, however, and some have claimed that feed-in tariffs, especially those not based on avoided costs, are preempted by federal law. Congress should remove the legal uncertainty by clarifying that states are free to develop a feed-in tariff without fear of preemption. The House of Representatives has passed House Resolution 2454 (the Waxman-Markey Bill), with Section 102 of the bill clarifying that states have the authority to set rates for the purchase of renewable energy pursuant to a state-approved incentive program. Congressional leaders must now ensure that this provision becomes law.

Require FERC to consider decentralized renewable energy generation as an alternative or as a complement to siting new transmission lines for renewable energy projects. FERC should make the expansion of decentralized generation a policy goal that is identified as a preferred alternative to siting new transmission lines for large central-station projects when decentralized generation is demonstrated to be the more cost-effective alternative.

State Government

Strengthen and expand the feed-in tariff program (see above).

Improve the net metering program by increasing the size limits on eligible sources and the utility load percentage that can be met through decentralized generation. As discussed, net metering in California caps the size of eligible sources of renewable energy generation and the total amount of generation allowed as a percentage of each utility's load. These limitations must be increased or eliminated. AB 560, which would have increased the cap to five percent, was tabled in September 2009. The legislature will have to address this issue again in 2010. But even a five percent cap will likely be insufficient in the near future to accommodate the rising demand for renewable energy generation technology.

Expand the Renewable Energy Transmission Initiative (RETI) process to include decentralized generation as a preferred alternative to new transmission-dependent large renewable energy projects whenever decentralized generation is more cost-effective. RETI has focused exclusively on facilitating large central-station projects. The state should ensure that decentralized generation alternatives are accorded preferred weight in the RETI process.[41]

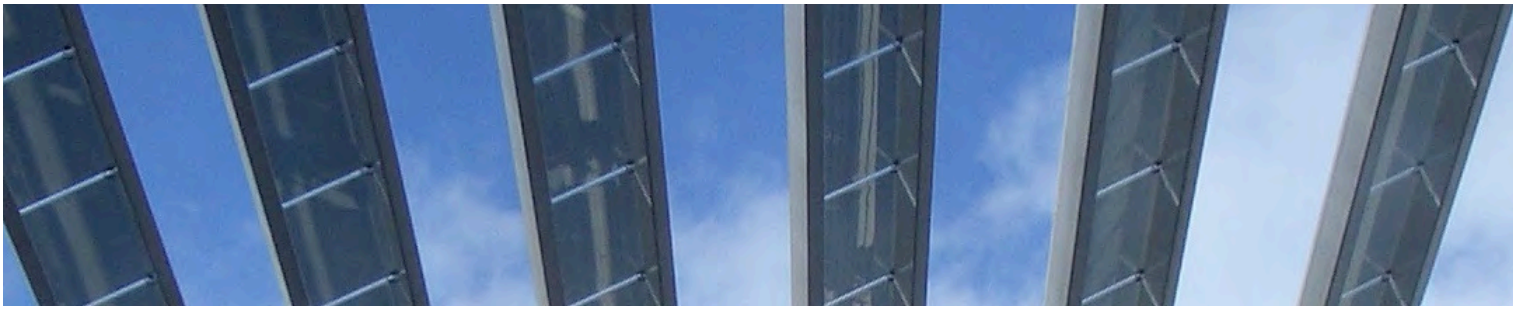
Modify the California Solar Initiative to provide rebates for PPAs when the electricity generated is used off-site. Currently, the CSI only offers rebates to PPAs where the energy is consumed on-site.[42] Allowing rebates for PPAs with off-site consumption would provide greater incentives for these financing arrangements and therefore greater deployment of renewables.

Require utilities that lease commercial rooftop space for renewable energy installations to offer the property owners an option to share some of the costs and benefits. More commercial property owners may be willing to lease their roof space to utilities for renewable energy production if they could use some of the electricity for their on-site needs or could earn renewable energy credits (REC) from the renewable energy produced. The CPUC should consider requiring utilities to present these options to potential lessees.

Local Government

Simplify the permitting process for renewable energy technology, including wind and solar, to create a "one-stop shopping" permit. Many business and agencies have limited resources to navigate the complex permitting requirements. A simplified process with easy-to-use brochures and checklists would solve this problem. The Sierra Club Loma Prieta chapter recently issued a comprehensive survey of local government permitting practices, which highlights model procedures for other cities and counties to follow. The report noted that cities need to have a "progressive attitude" about promoting renewable energy, should streamline permit processes with flat fees, and train staff to inspect renewable energy systems.[43]

Share best practices for permitting and siting with other local governments. Local governments that have been at the forefront of siting renewable energy technology should help other local governments learn from their experiences. The Sierra Club report, referenced above, lists standout cities in the San Francisco Bay Area, including Mill Valley, Palo Alto, Novato, San Jose, Saratoga and Walnut Creek.[44]



Barrier # 3: Lack of Education & Outreach

Despite the opportunities to save money over the long term, many businesses may be too busy or lack the resources to research the process and the potential financial benefits of installing renewables. They also may believe that they would benefit by waiting to purchase the technologies in anticipation of continued price declines. Public agencies, meanwhile, often do not view capitalizing on their physical assets, such as highway land or aqueducts, as part of their organizational mission.

"We have CalTrans, water resources, and other huge assets in the state for renewables. But unless agency performance is based on delivering a product, they stay parochial in their focus."

-- R. Gregg Albright
California Business, Transportation & Housing Agency

SOLUTION: Educate Business Owners and Policy Makers about the Benefits and Opportunities for Decentralized Renewable Energy Generation

The renewable energy industry should utilize existing advocacy groups or combine its marketing power to conduct an education and outreach campaign. Such a group should lobby the local, state, and federal governments to make renewable energy opportunities part of their agencies' mission. In addition, the group could make local governments aware of how proper planning can facilitate renewable energy production. Finally, the campaign could contact businesses to make them aware of the renewable opportunities on their facilities and to provide them with resources to expedite the transaction.

State & Federal Governments

Instruct state and federal agencies to utilize, when possible, public spaces and buildings, including structures along rights-of-way, large offices, and other sizeable facilities for renewable energy generation. Without a clear directive in their organizational mission, an agency is unlikely to capitalize on the renewable energy potential of its assets.

"Our company has thousands of sales people with relationships, and we need to get those people educated to press the issue. The majority of landlords don't have time to do it on their own. How can we partner with installers to get the word out and educate people faster?"

-- Mike Kimball
CB Richard Ellis

Modify procurement processes and rules to encourage agencies to invest in renewable energy. For example, the United States General Services Administration requirement that agencies search for the "lowest-cost" service or technology may impede renewable energy purchases that may not appear to be "lowest cost" when considering only the upfront cost alone. Agencies should be allowed and encouraged to capitalize on these technologies due to their long-term cost-effectiveness and overall utility to the environment.

Local Government

Direct planners to consider renewable energy potential when they devise local codes and ordinances. This process could include zoning and building height rules that maximize sun exposure to increase the solar potential for buildings, as well as zoning and building codes designed to harness the potential of wind energy as it travels through municipalities.

Designate preferred areas for renewable energy development as part of the general plan update process. General plans represent the blueprint for how a city or county will develop, and the zoning and other building and infrastructure requirements must conform to this document. By highlighting areas where local renewable energy generation facilities, such as rooftop or ground-mounted solar panels or wind turbines, could be effectively located, general plans can facilitate the construction of these facilities.

"We're seeing dramatic changes now with price drops of 30 percent, which is likely to continue on an accelerated basis this year relative to previous years."

-- Julie Blunden
Sunpower

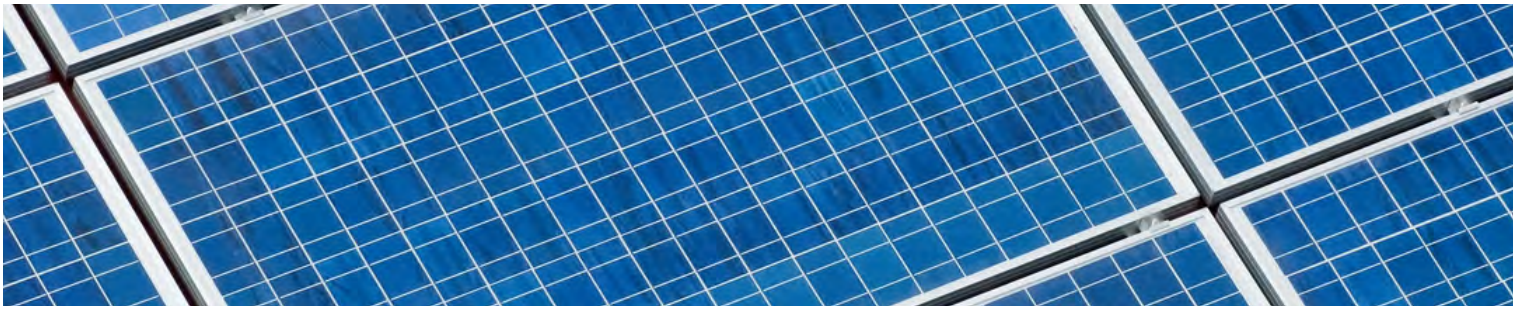
Industry Leaders

Educate company salespeople, large building owners, and policy makers about the potential for siting large renewable energy arrays on their properties. Renewable energy suppliers will need an organized marketing campaign to inform companies and agencies about their decentralized generation opportunities.

Educate businesses about the time-limited nature of existing federal and state tax credits to encourage immediate investment in renewable technology. Ironically, as the cost of renewable energy technology, particularly solar panels, has decreased, many businesses are reluctant to lock in long-term contracts when they expect the prices to continue dropping. When a business sees the price of solar technology drop 30 percent in one year, that business is unlikely to want to invest now when more cost-savings may occur in another 12 months. Industry leaders can address this problem by educating potential customers about the benefits of purchasing now. For example, the incentives under the CSI program decline by seven percent each year until an eventual phase-out, and feed-in tariff programs contain diminishing payment structures over time. Customers may want to capitalize on these incentive programs while they still exist, even with the likelihood of future price decreases. Ultimately, the sales and marketing departments at renewable energy companies will have to address the perception among customers that they will benefit financially by waiting to purchase.

"If you have a ten-year-old roof, you don't want to put a 20-year asset on top of it without revisiting the decision to re-roof. So there are physical limitations and timing issues."

-- Fran Inman
Majestic Realty Co.



Barrier # 4: Landlord/Tenant Split Incentives

Some commercial property owners are reluctant to install renewable energy arrays that will lower energy costs for their tenants but not provide the landlords with financial returns. The tenant, meanwhile, is reluctant to pay for renewable energy systems that may improve the value of the property but provide only short-term benefits for the tenant, who may move to a different building soon. Complicating matters, under the net metering program, the renewable energy produced on-site can only offset the electric bill from one meter. Therefore, renewable energy produced on a building cannot benefit the multiple tenants if they pay their electricity bills separately.

SOLUTION: Improve the Energy Payment and Rebate Policies for Landlords and Tenants

Policy makers should ensure that the party that invests in the renewable technology will receive the financial benefit. A comprehensive feed-in tariff would address this problem from the landlord's perspective. A feed-in tariff would ensure that the payments from the renewable energy generated on the building would flow directly to the owner/investor. The tenant's on-site energy use would be irrelevant in this scheme because the energy produced on the roof bypasses the meters on the building and goes directly into the grid. Another solution involves allowing multiple tenants with separate meters to receive a share of the net metering retail benefits from a single renewable array.

"We have existing buildings with multiple tenants and meters. It's too much work to feasibly make renewables happen. It should be much easier."

-- Robyn Uptegraff
The Irvine Company

State Government

Devise a feed-in tariff program that will allow the renewable energy investor/property owner to receive payments directly for the energy generated on the property. Under this program, the landlord/investor receives payments directly from the utility for the electricity generated on the property and fed into the grid, rather than having that energy reduce the tenant's electricity bill (as with net metering) with no savings or financial benefits for the owner.

Expand virtual net metering to allow multiple tenants in a single building to receive proportional credit on their electricity bills for the renewable energy generated on-site. The net metering program can typically provide retail benefits for only one meter from the energy produced on-site. As a result, a landlord is likely to install a renewable array just large enough to supply power for common areas paid for by the landlord, but not large enough to benefit multiple tenants on-site. However, the PUC recently created an exception that requires IOUs to credit all the meters in certain buildings with a share from the on-site renewable generation (called "virtual net metering"). Under this program, a landlord can install a renewable system on a building and use the electricity credits to offset the energy use from the building's common areas (such as hallways

and community facilities), with the remaining credits offsetting each tenant's electricity bill according to a pre-determined proportion. However, the program, called the Multifamily Affordable Solar Housing (MASH), only applies to certain multifamily affordable housing projects. The PUC should expand MASH and virtual net metering to cover all types of buildings and customers.[44] An expanded rule would allow all building owners who finance a renewable energy installation on their property to receive savings on the common area electricity bills. In addition, the owner could negotiate fixed payments or higher rent from tenants who experience substantial savings on their electricity bills.

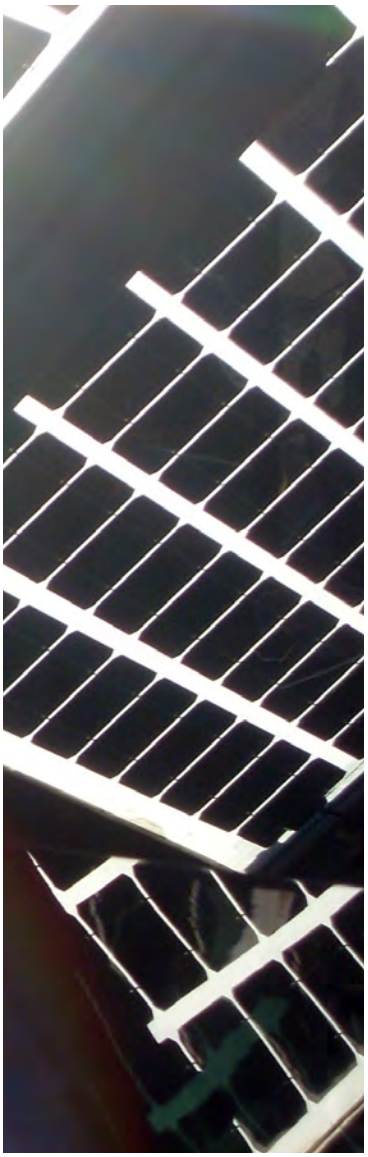
Municipal Utilities

Devise a feed-in tariff program to stimulate landlord investment in renewable energy generation (see above).

Conclusion: Big Opportunities

Heightened support for renewable energy at all levels of government is providing the renewable power industry with new opportunities and a potentially paradigm-shifting moment. While the current economic downturn threatens the short-term viability of many renewable projects and companies, in the long term, climate change laws and the increasing cost of fossil fuel-based energy assure greatly expanded use of renewable energy in the long term.

But rather than wait for large renewable energy plants to become available, policy makers should strengthen existing laws and provide additional financing for decentralized renewable energy generation technology. Ultimately, decentralized generation represents the most immediate means for California to expand renewable energy production in the state and to combat climate change. But it will take a combined effort at all levels of government, and a substantial exercise of political will by businesses and the public, for decentralized renewable energy generation to reach its potential.



Participant Bios

R. Gregg Albright

California Business, Transportation & Housing Agency

R. Gregg Albright has over 31 years of experience in State government service within planning, project delivery, project management, local programs, community involvement and administration. Beginning in 1976 as a Landscape Architect, Gregg worked through a variety of headquarters and district settings. In 2000, he was promoted to District 5's Deputy District Director for Planning and Local Assistance and two years later he was appointed as the District 5 Director. As District Director, Gregg continued his emphasis on stakeholder collaboration in the planning and development of transportation solutions. With his appointment as Deputy Director, Gregg has expanded opportunities to promote effective stakeholder involvement and to advance proactive and strategic behavior within the Department. This emphasis on enhancing staff skill sets and organization competency has also engaged him at the national level, particularly in the area of promoting the principles of Context-Sensitive Solutions.

Ken Baker

Wal-Mart

Ken is a native of Hot Springs, Arkansas and currently resides in Bentonville, Arkansas where he is a Sr. Manager of Sustainable Regulation for Wal-Mart Stores, Inc. Ken worked in Wal-Mart's Real Estate Department for 6 years before transferring to the Energy department in 2007. Before his tenure at Wal-Mart, Ken practiced law in Little Rock, Arkansas. Ken holds a Bachelor of Science degree from College of St. Frances, located in Joliet, Illinois and a Juris Doctor degree from the University of Arkansas at Little Rock School of Law.

Obadiah Bartholomy

Sacramento Municipal Utility District

Obadiah Bartholomy is a Project Manager in the Advanced Renewable & Distributed Generation Technologies group at SMUD. He has worked on PV performance monitoring for SMUD's fleet of 1,400+ PV systems for 6 years, and currently works on solar R&D, commercial and residential solar mapping tools, and utility scale solar assessment for meeting SMUD's Renewable Portfolio Standards. He also leads many of SMUD's climate change activities related to AB 32 implementation, strategic planning, physical impact assessment, mitigation and carbon offsets. He earned a BS in mechanical engineering from Cal Poly, San Luis Obispo and an MS in Transportation Technology & Policy from UC Davis.

Julie Blunden

SunPower

Since April of 2005, Julie has served as VP of public policy and corporate communications at SunPower, leading public relations, financial relations, public policy, and market development. Prior to SunPower, Blunden was a consultant at KEMA-XENERGY on energy markets, renewable resources and policy to industry, utilities and state and federal governments. In that role, Blunden supported the Schwarzenegger administration in developing the Million Solar Homes Initiative. In 1997, she co-founded Green Mountain Energy Company, a national retail electric supplier of renewable power. Blunden began her career doing development and acquisitions in the independent power generation business at the AES Corporation. She received her MBA from the Stanford Graduate School of Business and an AB from Dartmouth College majoring in engineering, modified with environmental studies. She serves on the board of directors at the Center for Resource Solutions and the Real Goods Solar Living Institute, as well as on the board of advisors for Vote Solar.

Dave Brennan

Solar Sonoma County

Dave Brennan was recently appointed to the position of Regional Climate Protection Coordination Plan (RCPCP) Manager with the Sonoma County Transportation Agency (SCTA). The development and implementation of a coordination plan is being supported by Sonoma County, all nine cities in Sonoma County, Sonoma County Water Agency and SCTA. Prior to Mr. Brennan's appointment, he served as the City Manager in Sebastopol for nine years working with local leaders on several energy conservation programs resulting in 215 KW of solar power installed on city facilities and housing projects. Prior to Sebastopol, Mr. Brennan served in city, county and regional government in public administration and program

management including financial management, redevelopment, capital project financing, personnel administration, solid waste management, regional housing and economic development programs.

Joe Desmond

Joseph Desmond served as Chairman of the California Energy Commission and was appointed Under Secretary for Energy Affairs in the California Resources Agency. As Chairman, Mr. Desmond represented the Governor on the Western Interstate Energy Board (WIEB). Mr. Desmond, of Pleasanton, served as Deputy Secretary for Energy at the Resources Agency in 2004. Prior to that, he was President and Chief Executive Officer of Infotility, Inc., an energy consulting and software development firm for four years. From 1997 to 2000, Mr. Desmond was President and Chief Executive Officer of Electronic Lighting, Inc., a manufacturer of controllable lighting systems, and from 1991 to 1997 he was with Parke Industries, where he served as vice president. Mr. Desmond was marketing and demand planning administrator for Taunton Municipal Lighting Plant, a publicly owned utility, from 1987 to 1991. He also served as co-chair of the Silicon Valley Manufacturing Group's Energy Committee from 2001 to 2004 and as a board member of the National Association of Energy Service Companies.

Mark Freyman

Chevron Energy Solutions

Mark Freyman has fifteen years of finance, strategy, partnership development, and operations experience. At Chevron Energy Solutions, he works on strategy and finance issues. Previously, Mr. Freyman has been a distributed generation solar project developer (VP, Finance at Verde Energy) and a utility-scale wind developer (VP, Finance and Project Development at Katabatic Power). Katabatic Power develops wind farms in British Columbia marrying a world-class wind resource with the firming capabilities of BC Hydro's hydro-electric assets. Mr. Freyman also spent five years as a strategy consultant helping high tech clients position their products and marketing messages and bringing new products to market. Mr. Freyman began his career at American Airlines negotiating joint ventures with Latin American air carriers covering sales, marketing and operations. Mr. Freyman holds an MBA from Harvard Business School and a BBA in Finance from the University of Michigan.

Richard Gruber

First Solar

Richard Gruber leads First Solar's project development efforts, focused on developing utility scale solar PV power plants in the southwestern U.S. First Solar, headquartered in Tempe, AZ is the world's largest and lowest cost manufacturer of thin film photovoltaic solar modules and trades on the NASDAQ under the ticker FSLR. Prior to joining First Solar, Gruber was with The Electric Reliability Council of Texas (ERCOT), the independent system operator responsible for running the Texas electric grid. Richard led the development and operation of ERCOT's wholesale and retail Market Services supporting Texas' electric market deregulation evolution. Prior to ERCOT, Gruber was Vice President, Marketing and Sales at NUI Corporation (NYSE) a natural gas utility with operations in NJ and FL, and President of NUI Energy Solutions, an energy services company. Prior to NUI, Gruber was Co-Founder and C.O.O. of Exchange Development Corporation, an incubator company created to establish more efficient and transparent energy markets. Earlier in his career, Gruber was a consultant engaged in business development for Energy Management Associates.

Fran Inman

Majestic Realty Co.

As Senior Vice President, Corporate Development, Fran Inman directs all marketing, public relations, government relations and community affairs activities for Majestic Realty Co., the privately held development firm based in Los Angeles County. With a real estate portfolio of more than 50 million square feet, Majestic Realty has offices in Los Angeles, Atlanta, Denver and Las Vegas. In recent months, Fran's responsibilities have included coordination and administration of the company's anti-secession efforts in the City of Los Angeles. In 2002, she also was named the founding director of the Majestic Foundation, the firm's newly established corporate-giving program. From January, 1998 to June, 2001, Fran was Executive Vice President of the Silverton Hotel & Casino in Las Vegas, Nevada, a property owned by Edward P. Roski, Jr. Prior to joining Majestic, Fran owned her own consulting business in the leisure and entertainment industry, providing business planning and marketing strategies for clients worldwide. She received both a BA and an MBA in Finance from California State University, Fullerton.

Mike Kimball

CB Richard Ellis

As National Director of CBRE's Solar Group, Mike Kimball is responsible for the leadership of CB Richard Ellis' solar services across the Americas. Additionally, Mike oversees the company's global solar strategy and implementation with Charlotte Eddington. CBRE's solar services are part of the broader services offered by CBRE's Energy & Sustainability Group. CBRE's Energy & Sustainability Group interacts with all divisions of CBRE. CBRE's Solar Group focuses 100% of their time on the solar industry and provides solar services to any landlord or tenant ("client") who wants to know if installing a solar system anywhere on their property makes economic sense. CBRE educates the client on the feasibility of solar and (if solar makes sense for the client) CBRE helps the client select the right solar installation company to install the solar system through a professional managed bid process. Prior to heading up CBRE's Solar Group in 2008, Mike spent 5 years working in CBRE's Brokerage division in Los Angeles, California. Mike's brokerage experience included lease and investment sale transactions for industrial, office, retail, and entitled/unentitled land properties.

Jay Knoll

Unisolar

Jay Knoll is Senior Vice President, General Counsel and Chief Administrative Officer of Energy Conversion Devices, Inc., the leading global manufacturer of thin-film flexible solar laminate products for the building integrated and commercial rooftop markets. Before joining ECD, Mr. Knoll held leadership positions at Collins & Aikman Corporation, Lear Corporation, Covisint LLC, Visteon Corporation and Detroit Diesel Corporation. Mr. Knoll received a B.A. degree from the University of Michigan and a J.D. degree from the Wayne State University School of Law. He is active in community activities and has held leadership positions with the American Jewish Committee (Detroit Chapter) and the Karmanos Cancer Institute.

Craig Lewis

RightCycle Enterprises

Craig Lewis, Principal of RightCycle Enterprises, is a Government Relations Advisor to clean technology clients with a focus on achieving desirable outcomes via legislation, regulation, and public funding (grants, siting incentives, etc) in California, at the Federal level, and in other states. Until early-2009, Mr. Lewis was VP of Government Relations for GreenVolts, where he served for two years securing successful policy outcomes in legislation, regulation, and public funding. In 2005, he spearheaded energy policy development for Steve Westly's 2006 gubernatorial campaign in California. Mr. Lewis is a leading renewable energy strategist and advocate. Among other efforts, Mr. Lewis leads the effort to introduce a comprehensive Feed-In Tariff (FIT) in California and to unleash the tremendous potential of the Wholesale Distributed Generation (WDG) market segment, which is the 20MW-and-under, distribution-interconnected market segment that avoids transmission dependencies and the long delays that are associated with transmission build-outs. Mr. Lewis has held senior government relations, corporate development, and marketing positions at wireless and semiconductor leaders, including Qualcomm, Ericsson, LinCom Wireless, Comarco Wireless, and Altera. He was active in the strategic planning and lobbying efforts to obtain the long-sought approval for CDMA technology in China; and has led the establishment of several successful business operations in Asia. Mr. Lewis received his MBA and MSEE from the University of Southern California, and his BSEE from UC Berkeley. Mr. Lewis was also a formative member of the Clean Tech for Obama (CT4O) organization, which was highly successful in raising funds for the Obama campaign.

Eric Lundquist

Banc of America Leasing

Eric Lundquist is a Managing Director in the Pricing & Portfolio Analysis group for Banc of America of Leasing. He and his team are responsible for the financial modeling and economic analysis work on most complex transactions in both Banc of America Public Capital Corp and Banc of America Leasing. In recent years, Eric has had a senior role on all of Banc of America Public Capital Corp's high-profile green transactions, including wind and solar deals closed under various structures. In addition, he is an internal resource for developing and structuring new products, and acts as a general advisor on tax and legislative related issues. Prior to joining Banc of America Leasing (via Fleet Capital Leasing) in 2000, Eric was a technical support and product development associate in the New York office of Warren & Selbert, the industries leading provider of lease pricing software. Eric also spent two years as a financial analyst at McManus & Miles, working on project finance and energy leasing transactions. Eric is an active member of the Equipment Leasing & Finance Association's Federal Tax Committee. He holds a Bachelor of Arts degree (cum laude) from Harvard University.

Wally McOuat

HMH Resources

Wally McOuat was one of the founders of HMH. He has twenty-five years experience in the energy industry as a financial advisor and negotiator both in the United States and abroad. He has played a major role in the development of several high-profile projects and has assisted many clients in the successful implementation of cutting-edge as well as 'typical' energy projects. Wally spent the first six years of his career with Price Waterhouse, serving as a Tax Manager during the last two years. He subsequently worked in the risk management industry where he helped form Risk Sciences Group, Inc. (RSGI) - a company that is still an industry leader in the analysis and quantifying of insurable risks. Wally earned an A.B. in mathematics and an MBA from Indiana University where he was elected to several honoraries including Phi Beta Kappa. Wally has also been active in community affairs including a term as chairman of the Marin County Planning Commission.

Neal Skiver

Bank of America

Neal Skiver is a Senior Vice President, Energy & Power Finance, for Banc of America Public Capital Corp located in Santa Fe, New Mexico. He focuses on the origination and structure of energy-related financings including: equipment lease/purchase agreements, energy services agreements, renewable energy power purchase agreements, Clean Renewable Energy Bonds, limited tax and revenue obligations, tax credits and 501(c)(3) obligations. Prior to joining Banc of America Public Capital Corp in June 2006, Neal was at National City Energy Capital, which is a subsidiary of National City Bank. For the 12 years prior to joining National City, Neal was at several divisions within ABN AMRO and LaSalle National Bank, including investment banking and the leasing corporation. Neal was responsible for the origination of various municipal and energy-related financing products for its portfolio and for syndication or securitization to other funding sources. Neal has been in the municipal financing business for the past 23 years, dedicated to the energy marketplace for the past 13 years. Neal is an active member of the National Association of Energy Service Companies and the Association of Governmental Leasing and Finance. Neal attended Northwestern University and graduated from the University of Denver with a BSBA (Cum Laude) in Marketing and Finance.

Robyn Uptegraff

Irvine Co.

Robyn Uptegraff serves as Senior Vice President, Community & Environmental Affairs for the Irvine Company, a century-old, privately-held company known for the master planned, sustainable communities it has developed on The Irvine Ranch in Orange County. Ms. Uptegraff is responsible for key entitlement and environmental issues for development throughout the Ranch, including local, State and National policy related to environmental issues such as endangered species, water quality and air quality. In addition, Ms. Uptegraff leads company efforts to ensure that appropriate environmental assessment is completed as required by CEQA prior to any project consideration, for environmental permitting from resource agencies and for environmental compliance during construction and operation. Before joining the Irvine Company, Ms. Uptegraff was the Executive Director of the Planning & Building Agency in Santa Ana for eleven years. In this capacity, Ms. Uptegraff was responsible for all current and advance planning, plan check, inspection and code enforcement efforts. Prior to this, Ms. Uptegraff served in the economic development and redevelopment programs in Santa Ana. Ms. Uptegraff graduated from the University of California, Irvine with a degree in Social Ecology.

Case van Dam

California Wind Energy Collaborative

C.P. "Case" van Dam is a professor of mechanical and aeronautical engineering at the University of California at Davis and heads the California Wind Energy Collaborative; a partnership between the University of California and the California Energy Commission. He previously was employed as a National Research Council (NRC) post-doctoral researcher at the NASA Langley Research Center and as a research engineer at Vigyan Research Associates in Hampton, Virginia and joined UC Davis in 1985. Van Dam's current research includes wind energy engineering, aerodynamic drag prediction and reduction, high-lift aerodynamics, and active control of aerodynamic loads. He has extensive experience in computational aerodynamics, wind-tunnel experimentation and flight testing; teaches industry short courses on aircraft aerodynamic performance and wind energy; has consulted for aircraft, wind energy, and sailing yacht manufacturers; and has served on review committees for various government agencies and research organizations.

Endnotes

1 Daniel M. Kammen, Kamal Kapadia, and Matthias Fripp, *Putting Renewables to Work*, UC Berkeley, Renewable and Appropriate Energy Laboratory, April 13, 2004, p. 2. Available at: http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf

2 California Air Resources Board, *Climate Change Scoping Plan*, December 2008, p. 10. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

3 California Air Resources Board, *Climate Change Scoping Plan*, December 2008, p. ES-1.

4 Governor Arnold Schwarzenegger, Executive Order S-3-05, June 1, 2005. Available at: http://gov.ca.gov/executive-order/1861/

5 California Air Resources Board, *Climate Change Scoping Plan*, December 2008, p. 12.

6 California Senate Bill 107, Statute of 2006, Chapter 464.

7 Governor Arnold Schwarzenegger, Executive Order S-14-08, November 17, 2008. Available at: http://gov.ca.gov/executive-order/11072/

8 California Air Resources Board, *Climate Change Scoping Plan*, December 2008, p. 16.

9 Governor Arnold Schwarzenegger, Executive Order S-21-09, September 15, 2009. Available at: http://gov.ca.gov/executive-order/13269

10 California Senate Bill 1, Statute of 2006, Chapter 132.

11 Bill Powers, *San Diego Smart Energy 2020*, October 2007, p. 9. Available at: www.etechinternational.org

12 California Public Utilities Commission, *Renewables Portfolio Standard Quarterly Report*, July 2009. Available, at: http://www.cpuc.ca.gov/NR/rdonlyres/EBEEB616-817C-4FF6-8C07-2604CF7DDC43/0/Third_Quarter_2009_RPS_Legislative_Report_2.pdf.

13 California Energy Commission, *2007 Integrated Energy Policy Report*, November 2007, p. 13. Available at: http://www.ceert.org/ceert_reports/CRETI%20Mission%20-%20final.pdf

14 Combined transmission and distribution losses for off-site electricity production equal approximately eight to nine percent of the energy generated. Energy Information Administration, U.S. Department of Energy, *Overview: Electricity Generation*. Available at: http://www.eia.doe.gov/cneaf/electricity/page/prim2/chapter3.html

15 California Energy Commission, *California Feed-In Tariff Design and Policy Options*, November 2008, p. 7.

16 California Public Utilities Commission, *33% Renewable Portfolio Standards: Implementation Analysis Preliminary Results*, June 2009, p. 1. Available at: http://www.cpuc.ca.gov/NR/rdonlyres/B123F7A9-17BD-461E-AC34-973B906CAE8E/0/ExecutiveSummary33percentRPSImplementationAnalysis.pdf

17 California Energy Commission, *2007 Integrated Energy Policy Report*, November 2007, p. 136 & CRETI Mission Statement.

18 Mark Rawson, *Distributed Generation Costs and Benefits Issue Paper*, Public Interest Energy Research, California Energy Commission, p. ii.

19 Matthew H. Brown and Richard P. Sedano, *Electricity Transmission: A Primer*, National Council on Electric Policy, June 2004, p. 2. Available at: http://www.raponline.org/Pubs/ELECTRICITYTRANSMISSION.pdf

20 Public Interest Energy Research Program, *Distributed Renewable Energy Assessment Final Report*, August 11, 2009, p. 10.

21 Maya Chaudhari, Lisa Frantzis and Dr. Tom E. Hoff, *Grid Connected Market Potential under a Cost Breakthrough Scenario*, Navigant Consulting, September 2004, p. 30.

22 California Public Utilities Commission, *33% Renewable Portfolio Standards: Implementation Analysis Preliminary Results*, June 2009, pp. 4-9.

23 Craig Lewis (RightCycle), *RightCycle comments on June 2009 CPUC preliminary analysis of cost of compliance with 33% by 2020 renewable energy target*, August 28, 2009.

24 California Public Utilities Commission, *33% Renewable Portfolio Standards: Implementation Analysis Preliminary Results*, June 2009, p. 31.

25 California Public Utilities Commission, Resolution E-4240, May 21, 2009.

26 California Energy Commission draft report, *Comparative Cost of Electric Power Generation Technologies*, August 2009, p. 56. Available at: http://www.energy.ca.gov/2009publications/CEC-200-2009-017/CEC-200-2009-017-SD.PDF

27 California Energy Commission draft report, *Comparative Cost of Electric Power Generation Technologies*, August 2009.

28 California Public Utilities Commission, *Update on Determining the Costs and Benefits of California's Net Metering Program*, March 29, 2005, p. 8. Available at: http://docs.cpuc.ca.gov/word_pdf/REPORT/45133.PDF

29 Bill Powers, *San Diego Smart Energy 2020*, October 2007, p. 10.

30 Editorial, *Legislature Must Act to Keep Solar Glowing*, San Francisco Chronicle, June 28, 2009, p. E-10. Available at: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2009/06/28/ED2416TQUI.DTL

31 California Public Utilities Commission, *Update on Determining the Costs and Benefits of California's Net Metering Program*, March 29, 2005, p. 6.

32 California Public Utilities Commission, Rulemaking 06-03-004, March 2, 2006. Available at: http://docs.cpuc.ca.gov/published/FINAL_DECISION/63678.htm

33 California Energy Commission, *California Feed-In Tariff Design and Policy Options*, November 2008, p. 5.

34 California Public Utilities Commission, Resolution E-4137, February 14, 2008. Available at: http://docs.cpuc.ca.gov/PUBLISHED/AGENDA_RESOLUTION/78711.htm

35 California Senate Bill 32, Statute of 2009, Chapter 328.

36 California Energy Commission, *California Feed-In Tariff Design and Policy Options*, November 2008, pp. 47-48.

37 California Public Utilities Commission, Administrative Law Judge's Ruling Regarding Pricing Approaches and Structures for a Feed-In Tariff, Rulemaking 08-08-009, August 27, 2009. Available at: http://docs.cpuc.ca.gov/efile/RULINGS/106274.pdf

38 California Energy Commission, *California Feed-In Tariff Design and Policy Options*, November 2008, pp. 14-18.

39 California Public Utilities Code §§ 218(b), (e), and 2868(b).

40 Qualifying facilities are either small-scale producers of commercial energy that normally self-generate energy for their own needs but may have occasional or frequent surplus energy or incidental producers who happen to generate saleable electric energy as a byproduct of other activities. Utilities must purchase energy from these facilities at highly-favorable rates for the producer in order to encourage more energy production from these facilities and to reduce dependence on other sources of energy. See online Energy Dictionary, *Definition of Qualifying Facilities*. Available at: http://www.energyvortex.com/energydictionary/qualifying_facility_%28qf%29.html

41 The RETI process, including the loading order, can be found on the CEC website, Energy Action Plan I and II. Available at: http://www.energy.ca.gov/energy_action_plan/index.html

42 California Public Utilities Commission, *California Solar Initiative: Program Handbook*, May 2009, p. 103. Available at: http://www.gosolarcalifornia.ca.gov/documents/CSI_HANDBOOK.PDF

43 Carl Mills and Kurt Newick, "Solar Electric Permit Fees in Northern California," Sierra Club, December 12, 2008. Available at: http://lomaprieta.sierraclub.org/global_warming/pv_permit_study.htm#Executive_Summary

44 Carl Mills and Kurt Newick, "Solar Electric Permit Fees in Northern California," Sierra Club, December 12, 2008.

45 For more information on MASH, visit http://www.cpuc.ca.gov/PUC/energy/Solar/mash.htm

Photos for the whitepaper are courtesy of Thompson Technology Industries, Oregon Department of Transportation, Wayne National Forest Management, Johan Larsson, Abi Skipp, Dullhunk, & Lance Cheung.