

The Wilderness Society  
New Mexico Wilderness Alliance  
Sierra Club – Grand Canyon Chapter

Sky Island Alliance

Western Resource Advocates  
Coalition for Sonoran Desert Protection  
Natural Resources Defense Council

**July 13, 2009**

*Delivered via electronic mail ([adrian\\_garcia@nm.blm.gov](mailto:adrian_garcia@nm.blm.gov); [nmsunziaproject@blm.gov](mailto:nmsunziaproject@blm.gov)) and U.S. mail.*

**Adrian Garcia, Project Manager  
Bureau of Land Management  
SunZia Southwest Transmission Project  
c/o EPG, Inc.  
4141 N. 32nd Street, Suite 102  
Phoenix, AZ 85018**

**Re: Scoping comments on the proposed SunZia transmission project**

Dear Mr. Garcia,

Please accept and fully consider these comments on the proposed SunZia transmission project (SunZia) by The Wilderness Society, Sky Island Alliance, Western Resource Advocates, and the New Mexico Wilderness Alliance; and on behalf of the Coalition for Sonoran Desert Protection, the Grand Canyon Chapter of the Sierra Club, and Natural Resources Defense Council.

The mission of The Wilderness Society 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 over 500,000 members and supporters nationwide, TWS represents a diverse range of citizens.

Sky Island Alliance is a grassroots organization dedicated to the protection and restoration of the rich natural heritage of native species and habitats in the Sky Island region of the southwestern United States and northwestern Mexico.

Founded in 1989, Western Resources Advocates (WRA) is a non-profit environmental law and policy organization dedicated to restoring and protecting the land, air, water and wildlife resources within the interior Western United States. Specifically, our team of lawyers, policy analysts and economists works to: (1) promote a clean energy future for the Interior West that reduces pollution and the threat of global warming; (2) restore degraded river systems and to encourage urban water providers to use existing water supplies more efficiently; and (3) protect public lands and wildlife throughout the region.

The New Mexico Wilderness Alliance and its more than three thousand members are also dedicated to the protection, restoration and continued enjoyment of New Mexico's wildlands and wilderness areas.

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, The Wilderness Society 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.

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, and The Wilderness Society and the undersigned support such responsible development of renewable energy. 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.

Though renewables should be developed first in areas close to existing transmission and demand, new transmission will be necessary to access stranded resources with no current access. Like renewables siting and development, this transmission must be sited and built in the best way possible, using an open, stakeholder driven process to identify and address siting conflicts early and aggressively pursuing all available options to minimize and mitigate any unavoidable impacts. This approach is of even more importance in the case of SunZia, because if the rich wind and solar resources accessed by the lines are to be developed fully, multiple additional lines will be necessary going forward. These additional lines should be sited in the same corridor as the SunZia lines to minimize impacts. With the potential for multiple high-voltage lines paralleling SunZia, it is of paramount importance that the SunZia corridor be chosen well.

### **Issues Addressed**

#### **I. Sun Zia's Proactive, Collaborative Approach to Siting To Date: A Model for Transmission and Energy Project Planning**

Active public engagement to identify and address siting and development issues early in the process provides the best chance for renewables and transmission projects to succeed, both in terms of limiting environmental and other impacts and avoiding serious conflicts that can prevent good projects from being built. SunZia, LLC (the applicant) has proactively sought input from the environmental community for nearly a year prior to the initiation of scoping and the public NEPA process. This proactive engagement has allowed siting and development issues to be identified and begun to be addressed as early as possible, providing more flexibility in identifying alternative locations and measures to minimize impacts. This approach does not guarantee success – only through completion of a robust Environmental Impact Statement (EIS) will all impacts and mitigation measures be identified, at which point the project can be evaluated for whether it should be built or not. However, a proactive approach offers the best chance of a positive outcome.

### **A. Need for Ongoing Open Collaboration Throughout the Project Permitting and EIS process**

The proactive approach begun by the applicant should be maintained throughout the development of the EIS, in coordination and cooperation with the BLM and the consultant hired to prepare the EIS, Environmental Planning Group (EPG). Every opportunity available should be afforded the public to understand and participate in the EIS process.

**Recommendations:** The applicant, BLM, and EPG should maintain a proactive approach to maximizing public engagement in the EIS process. This could include additional public meetings, opportunities for site visits and field tours, publication of preliminary draft alternatives prior to the publication of the Draft EIS, and other efforts to ensure robust public involvement.

### **B. Importance of Adopting this Model for All Planning Efforts**

The proactive approach maintained by the applicant to-date should be a model for all planning efforts, and BLM should highlight this approach and employ and continue to improve it in all its planning efforts.

**Recommendations:** BLM should highlight the proactive approach of the applicant and employ and continue to improve this model for all its planning efforts.

## **II. Flexibility for Alternatives and Better Options for Siting and Constructing Transmission Lines**

Development of large-scale transmission facilities will have significant impacts on the lands upon which they are located. These impacts include direct impacts from road construction, siting of tower pads and support infrastructure, and potential for bird and bat collisions with towers and wires; as well as indirect impacts such as habitat fragmentation, increased predation from perching raptors, and viewshed impacts. An inappropriately sited and constructed transmission line 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 development corridors in siting transmission lines.

### **A. Areas to Avoid**

We appreciate the BLM's acknowledgment that study of potential impacts to sensitive resources will be necessary as part of the EIS process. In addition to study of these potential impacts, BLM should identify areas to avoid in determining proposed and alternate routes for SunZia. Certain places are not appropriate for large-scale transmission lines and certain categories of lands should be avoided. Based on their

important natural values and potential for damage from the construction, use and maintenance of transmission lines, we recommend that the Draft EIS include a commitment to not siting proposed and alternative routes 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. Special Recreation Management Areas;
10. Threatened, endangered and sensitive species habitat, as well as critical cores and linkages for wildlife habitat;
11. Citizen-proposed wilderness areas; and
12. 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 siting of large-scale transmission lines.

**Recommendations:** SunZia should not be sited in the categories of lands listed above.

## **B. Maximizing Use of Impaired Lands and Existing Infrastructure**

In addition to avoiding ecologically-sensitive lands, we recommend that already impaired lands be considered first for siting SunZia. We appreciate BLM's commitment to prioritizing siting in these areas, as stated in the Federal Register Notice of Intent (NOI) - "To the extent feasible, the proposed route would use existing transmission line corridors and designated utility corridors located on Federal land." (NOI p. 3)

Existing ROWs, degraded agricultural lands, and other already impacted areas provide opportunities for siting transmission lines without loss of other uses and values. Such sites are often close to existing infrastructure, which provides additional benefits. 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.

**Recommendations:** Proposed and alternative routes for SunZia should specifically prioritize use of degraded lands that are not identified for restoration and sites with proximity to existing infrastructure to avoid unnecessary impacts on public lands.

## **C. Identification of Additional Feasible Alternative Routes**

BLM should identify additional feasible alternative routes as part of the EIS. Significant resource conflicts exist in several locations along the proposed and alternative routes identified in the Map of Preliminary Study Corridors<sup>1</sup>, and additional alternatives should be identified and evaluated. These alternatives include, but are not limited to:

**i. A route inside of the White Sands Missile Range in New Mexico**

A route should be considered running east of the existing alternative route along the western border of the White Sands Missile Range (WSMR). An alternative route just inside the border of the WSMR would allow SunZia to cross the Rio Grande River between Arrey and Derry while avoiding the Antelope and Jornada del Muerto WSAs and Citizens' Wilderness Proposal units south of there. A Rio Grande crossing between Arrey and Derry is far preferential to a crossing near San Antonio, where impacts to birds flying back and forth between the Bosque del Apache National Wildlife Refuge and Bernardo State Wildlife Area would be significant. The Rio Grande is also much more narrow and channelized, with much less ecologically important bosque adjacent, between Arrey and Derry. The route could enter the WSMR just south of the Dugout Canyon Citizens' Wilderness Proposal area, about halfway between the Sierra and Dona Ana County lines (also see attached GIS data for Citizens' Wilderness Proposal areas).

**ii. A route which continues to follow I-10 in Arizona**

A route should be considered heading west in Arizona which continues to follow I-10 where the existing alternative route heads northwest to the proposed Willow substation, then continuing along existing highways and transmission lines NW to the Tortola substation. Such a route would avoid the sensitive resources in the Aravaipa Valley, Aravaipa Canyon, the northern Pinaleno Mountains, the northern Galiuro Mountains, and the San Pedro River Valley.

**Recommendations:** BLM should consider alternative routes, including those identified above, which avoid significant impacts along existing proposed and alternative routes.

**D. Possible Mitigation Strategies**

Though SunZia has the possibility of providing significant benefits by facilitating renewable energy development and thus reducing greenhouse gas emissions from electricity production, there will be significant environmental impacts from developing the project. These impacts should be minimized and mitigated to the best degree possible, using best management practices, the best available technology, and innovative strategies.

BLM is obligated to manage the public lands to protect their varied natural resources. For instance, 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). In order for the agencies to rely on mitigation to reduce

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[http://www.blm.gov/pgdata/etc/medialib/blm/nm/programs/more/lands\\_and\\_realty/sunzia/sunzia\\_maps.Par.12943.File.dat/SZSW\\_OV%20Mar%205%202009.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/nm/programs/more/lands_and_realty/sunzia/sunzia_maps.Par.12943.File.dat/SZSW_OV%20Mar%205%202009.pdf)

potentially significant impacts, NEPA requires that the agencies make a firm commitment to the mitigation and discuss the mitigation measures “in sufficient detail to ensure that environmental consequences have been fairly evaluated...”<sup>2</sup> 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
- Compensating for the impact by replacing or providing substitute resources or environments.

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.”<sup>3</sup>

Valuable mitigation measures include siting as much of the project as possible on already disturbed lands and developing restoration plans for all temporarily used areas. Specific mitigation strategies for transmission projects can be found in the Final PEIS for West-wide Energy Corridors (Chapter 2.4).

#### **i. Burying Lines in Key Places**

Underground transmission lines often found in urban areas could be used to avoid impacts from large-scale transmission development along the SunZia route. Where consistent with environmental goals such as conservation of soil quality and plant life, the option to bury transmission lines should be considered where lines pass through high quality desert viewsheds or sensitive wildlife habitat of birds and/or bats. Underground lines carefully planned for cost-effectiveness and feasibility at a site-specific level have the potential to maintain natural landscapes while moving optimal voltages of renewable energy to load centers.

#### **ii. Require the Use of Best Management Practices and Innovative Technologies to Minimize Impacts**

BLM should require the use of best management practices and innovative technologies to minimize impacts. These could include, but are not limited to the best management practices and mitigation strategies identified in the Final PEIS for West-wide Energy Corridors (Chapter 2.4).

**Recommendations:** Specific mitigations strategies should be analyzed and committed to in the EIS. Mitigation measures must be mandatory and based on credible science. BLM should consider the option of requiring construction of underground transmission lines

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<sup>2</sup> *Communities, Inc. v. Busey*, 956 F.2d 619, 626 (6th Cir. 1992).

<sup>3</sup> *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).

where proposed rights-of-way pass through sensitive wildlife habitat, viewsheds and wherever possible to maintain the natural character of the desert landscape. BLM should carefully consider the impacts on soil and plant life that such underground transmission lines may have. BLM should also require the use of best management practices and innovative technologies, including but not limited to those identified above, to minimize impacts. These strategies will only work if they are mandatory and likely to tie in to the challenges specific to this project.

#### **E. The Department of Defense Should Become a Cooperating Agency**

In order to explore opportunities to for alternative siting within the WSMR which would avoid significant impacts to both the Rio Grande River corridor and the Antelope and Jornada del Muerto WSAs, as well as other resources, the Department of Defense should become a cooperating agency.

**Recommendations:** BLM should work with DOD to ensure that DOD joins the EIS process as a cooperating agency.

### **III. Issues Already Identified – to be Analyzed in Sufficient Detail and in Continuing Analysis After Scoping**

#### **A. Land Use, with Special Attention to Consistency with Local Government Land Use Plans**

Wherever possible, consistency with local land use plans is of paramount importance in ensuring compatibility of SunZia with existing laws, ordinances, regulations and standards.

**Recommendations:** BLM should ensure SunZia is as consistent as possible with local land use plans, laws, ordinances, regulations and standards.

#### **B. Potential Impacts on Wildlife Habitat, Plants and Animals Including Threatened, Endangered and Sensitive Species**

Significant biological resources could be impacted by construction of SunZia. The following is a description of some of the resources along parts of the proposed and alternative routes.

In New Mexico, it appears that the preferred route goes through the Nutt Grasslands, a sensitive grasslands ecosystem with rich and varied wildlife and plant species.

There is an existing major gas pipeline and utility corridor that mostly follows I-10 from at least the Lordsburg area to Tucson. This pipeline has undergone a major upgrade over the past three years and the area is currently disturbed. This utility corridor would make a good location for additional energy infrastructure and should be explored.

The preferred route from the Safford area west would likely cause significant impacts and is likely to cause significant concern and controversy. The route would run directly between two (Mt. Turnbull/Santa Teresa Mountains, and the Pinaleno Mountains/Mt. Graham) of the four sacred mountains of residents on both the San Carlos and White Mountain Apache Tribes. The Pinaleno Mountains (aka Mt. Graham) have been found by the Forest Service to be eligible for a “Traditional Cultural Property” designation.

Continuing west, the preferred route passes between the Galiuro Wilderness, and the Aravaipa Canyon Wilderness. Aravaipa in particular, is widely considered to be one of ecological and aesthetic gems of the region, and a very popular destination for folks looking to “get away” from civilization and have a unique outdoor experience. This is very remote land with little sign of human impacts. This route would likely cause significant impacts and is likely to cause significant concern and controversy.

Aravaipa Canyon is nationally recognized as one of Arizona’s most valuable biological areas. It is known for its scenic towering cliffs, lush riparian vegetation, multiple species of native fish and wildlife and its astounding beauty and naturalness. The perennial flow of Aravaipa Creek links 3 mountain ranges, 3 wilderness areas and maintains migratory corridors for both large mammals and birds, making it a crucial component to maintaining biodiversity and ecological integrity in southeastern Arizona.

The integrity of Aravaipa Creek’s stream flow depends heavily on the ecological health of the surrounding watershed. The Aravaipa Canyon watershed is bounded on the east by a low divide in the northwest Sulphur Springs Valley and on the west by the San Pedro River south of the town of Winkelman, Arizona. On the northeast the canyon is bounded by the Pinaleno and Turnbull-Santa Teresa ranges and on the southwest by the Galiuro Mountain range, the very north end of which is traversed by the creek. The watershed comprises approximately 1,400 km<sup>2</sup> and the perennial flow of the creek originates from unconsolidated sediments of the streambed 6.4 to 5.5 km northwest of the town of Klondyke. The watershed to the north and south of the existing Aravaipa Canyon Wilderness consists of tablelands cut by numerous tributary drainages that feed into Aravaipa Creek.

Three Areas of Critical Environmental Concern (ACEC) lie within the Aravaipa Canyon Watershed Management area including Turkey Creek, Table Mountain and Desert Grasslands. Table Mountain and Desert Grasslands are also designated as Research Natural Areas (RNA). Areas of Critical Environmental concern are defined by the BLM to be areas where “special management attention is required to protect and prevent irreparable damage to public land and/or related waters containing resources, values, systems, processes, or hazards identified, designated, and protected through the land-use planning process.” These areas must have significant cultural, scenic value; fish or wildlife resources; or other natural processes or systems, and must have substantial significance or value. This requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. Research Natural Areas are areas that contain important ecological and scientific values and are managed for minimum human disturbance. They are primarily used for non-manipulative research



and baseline data gathering on relatively unaltered community types. They make excellent controls for similar communities that are being actively managed.

The Turkey Creek ACEC consists of 2,326 acres that adjoins a portion of the Aravaipa Canyon Wilderness at its southeast end and contains two riparian woodlands. The area has significant cultural and scenic values and is an important wildlife resource and riparian area. The area is threatened by off road vehicle (ORV) use, unregulated camping and current and potential resource extraction.

The Table Mountain ACEC contains two plant communities of concern. These include an alligator juniper savanna at the top of Table Mountain that exists in less than 20 locations and a white oak woodland containing Mexican blue oak in the adjoining Sycamore and Saddle Canyons. The total area encompasses 1,220 acres to the south of the canyon and of concern in this area is ORV use, prescribed fire and preventing mineral withdrawal and vegetation impacts.

The Desert Grasslands ACEC is significant due to its relict desert grasslands which are an important baseline for management objectives. Desert grasslands are widely used for the majority of grazing in the desert southwest but also provide critical habitat for 13 state-listed wildlife species and are important for watershed stabilization. The retention of undisturbed tracts of relict desert grasslands is of value to BLM management and scientific research (BLM, 1991). The Desert Grasslands area is greatly threatened by ORV use, livestock grazing, and could benefit from a prescribed fire plan. It consists of 840 acres with three areas of undisturbed desert grasslands on two different soil types.

Today in Arizona, these riparian and wetland communities have become totally restricted to drainages that provide the necessary water supply throughout the growth season. Riparian corridors are the most endangered of Arizona's environments, with less than 10 percent remaining in an essentially natural state. These remaining corridors support an amount of species that is very disproportionate to their size. They are crucial corridors for species movement and stopover points for migrating species.

Table 1, below, lists special status species in the Aravaipa Canyon watershed.

**Table 1. Special Status Species in the Aravaipa Canyon Watershed**

COMMON NAME	SCIENTIFIC NAME	STATUS
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	S
American peregrine falcon	<i>Falco peregrinus anatum</i>	SC, WC
Aravaipa sage	<i>Salvia amissa</i>	S
Aravaipa wood fern	<i>Thelypteris puberula</i> var. <i>sonorensis</i>	S
Arizona giant sedge	<i>Carex spissa</i> var. <i>ultra</i>	S
Bald eagle	<i>Haliaeetus leucocephalus</i>	LT, WC
Belted kingfisher	<i>Ceryle alcyon</i>	WC
Black-bellied whistling-	<i>Dendrocygna autumnalis</i>	WC

duck		
Buff-collared nightjar	<i>Camprimulgus ridgwayi</i>	S
Catalina beardtongue	<i>Penstemon discolor</i>	HS
Cave myotis	<i>Myotis velifer</i>	S
Common black-hawk	<i>Buteogallus anthracinus</i>	WC
Desert sucker	<i>Catostomus clarki</i>	S
Fringed myotis	<i>Myotis thysanodes</i>	S
Gila chub	<i>Gila intermedia</i>	WC
Gila topminnow	<i>Poeciliopsis occidentalis</i>	LE, WC
Loach minnow	<i>Tiaroga cobitis</i>	LT, WC
Longfin dace	<i>Agosia chrysogaster</i>	S
Lowland leopard frog	<i>Rana yavapaiensis</i>	WC
Mexican spotted owl	<i>Strix occidentalis lucida</i>	LT, WC
Northern goshawk	<i>Accipiter gentilis</i>	WC
Northern gray hawk	<i>Asturina nitida maxima</i>	WC, S
Roundtail chub	<i>Gila robusta</i>	WC
San Carlos wild-buckwheat	<i>Eriogonum capillare</i>	SR
Sonora sucker	<i>Catostomus insignis</i>	S
Sonoran desert tortoise	<i>Gopherus agassizii</i>	LT, WC
Speckled dace	<i>Rhinichthys osculus</i>	S
Spikedace	<i>Meda fulgida</i>	LT, WC
Toumey agave	<i>Agave toumeyana</i> var <i>bella</i>	SR
Western red bat	<i>Lasiurus blossevillii</i>	WC
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	WC
LE – Listed Endangered under the Endangered Species Act LT – Listed Threatened under the Endangered Species Act		WC – Wildlife of Special Concern in Arizona. S – BLM Sensitive HS – Arizona Native Plant Law Highly Safeguarded SR – Arizona Native Plant Law Salvage Restricted

The route up the Sulphur Springs Valley (between the Galiuros and Pinalenos) would likely cause significant impacts and is likely to cause significant concern and controversy. This is an open valley with farms and some limited development for about 15 miles north of Wilcox, with limited development (very few and very scattered houses past that point into the upper valley).

The route up and across the San Pedro Valley will also pose significant impacts. The local residents are very conservation minded and there are a number of protected area along and adjacent to the river, including one owned by Pima County, and several owned

and/or administered by The Nature Conservancy. The San Pedro River is world renowned conservation and birding area (one of the designated “Last Great Places”) and highly treasured for its natural setting.

**Recommendations:** BLM should thoroughly analyze impacts to biological resources and minimize and mitigate impacts through alternative siting and other mitigation strategies.

### **C. Visual Resources and Related Viewsheds**

A viewshed is the entire landscape seen from a single observation point. Unobstructed viewsheds contribute to the sense of solitude and remoteness that is an important quality to the visitor experience. Visual resource management should be an integral planning consideration for transmission lines. To the greatest extent possible, viewshed areas designated as visual resource management Class II should be avoided, and Class I areas should be excluded from development altogether.

**Recommendations:** BLM should direct transmission line development to alternate locations away from sensitive viewshed areas that qualify as visual resource management Class II and areas identified as high quality viewsheds in public comments. BLM should exclude Class I visual resource management areas from development. Any impacts which are unavoidable should be minimized and mitigated to the greatest extent possible.

### **D. Historical Resources Including the Juan Bautista de Anza National Historic Trail, El Camino Real de Tierra Adentro National Historic Trail and Gila Trail, and Cultural Resources, Including Native American Traditional Cultural Properties and Sacred Places of the Gila People**

The BLM has already acknowledged the SunZia project’s potential effects to “...visual resources, National historic Trails and related viewsheds; Native American traditional cultural properties and sacred places” (NOI p. 5). Consequently, in the EIS, the BLM must adequately evaluate the direct, indirect and cumulative impacts of the proposed project on these and other historic and cultural resources.

Specifically, at least three historic trails could be directly or indirectly impacted by the SunZia transmission lines project: the Camino Real de Tierra Adentro National Historic Trail, the Juan Bautista de Anza National Historic Trail and the Gila historic trail. In the EIS, BLM should identify any “high potential route segments” and “high potential historic sites” that are located within the project area, and should develop alternatives to the proposed action that place the transmission lines as far from them as possible to avoid or minimize visual impacts to their viewsheds. Burying transmission lines may, therefore, be appropriate near these historic trails as long as mechanical excavation does not disturb subsurface archaeological deposits.

In addition to the three historic trails, many prehistoric and historic cultural resources undoubtedly are located along the path of and in close proximity to the proposed 1000-

foot transmission lines rights-of-way. Direct impacts to these resources, such as from ground disturbing construction activities, should be evaluated in the EIS. Indirect impacts to the resources, such as through erosion or sediment deposition resulting from construction activities and topography modifications, also should be adequately evaluated.

An evaluation of potential physical, visual, and social/psychological impacts to Native American traditional cultural properties and sacred landscapes also must be included in the EIS. Early and thorough consultation with Native American groups that may have connections to lands within and adjacent to the transmission line corridors is extremely important.

In addition to complying with the requirements of NEPA, we strongly urge BLM to begin the Section 106 process under the National Historic Preservation Act (NHPA) 16 U.S.C. § 470f as soon as possible because the SunZia project, as currently proposed, has the potential to adversely affect historic properties. The requirements of the NHPA are separate from NEPA's requirements, although the Section 106 regulations encourage federal agencies to coordinate the two processes. See 36 C.F.R. § 800.2(a)(4). Therefore, proper coordination of the NHPA and NEPA processes is necessary to ensure that adverse effects to historic properties are adequately taken into account, as required by the Section 106 regulations, 36 C.F.R. § 800, *et seq.* Proper consultation with Native American tribes, state historic preservation officers (SHPOs), national historic trail managers, local communities and other interested parties must be a central component of the Section 106 process, even if BLM chooses to comply with this process through NEPA.

**Recommendations:** BLM should prioritize protection of the area's outstanding cultural resources, including National Historic Trails, significant concentrations of prehistoric and historic archaeological sites and Native American traditional cultural properties and sacred landscapes. Accordingly, BLM should insist on thorough documentation of cultural resources within the proposed project's areas of potential effect through consultation with tribes, SHPOs, local communities and other interested parties and through archaeological and historical surveys. Then, BLM should consult with these parties to develop measures to avoid adverse effects of the transmission lines on significant cultural resources. If impacts are unavoidable, BLM should develop strategies to minimize and mitigate impacts, such as using topography to lessen visual disturbances of viewsheds and preparing landscape-scale geographic information system analyses of archaeological sites that may be destroyed during construction.

#### **E. Soil and Water Resources, Including Floodplains, Wetlands and the Rio Grande River corridor**

BLM should consider impacts to soil and water resources in the EIS. Surface disturbances run the risk of harming delicate desert soils that take decades to regenerate. The line may come in contact with priority conservation areas such as floodplains and wetlands where it crosses the Rio Grande River in New Mexico and other similar riparian

areas along the route. The potential environmental impacts to riparian vegetation and wildlife should be considered. In these areas, alternative locations should be carefully weighed to minimize disturbances to wetlands, floodplains and water resources from transmission line construction.

**Recommendations:** Consider all impacts to soil and water resources along the SunZia transmission route. Mitigation options and alternative location must be considered where transmission lines cross wetlands and floodplain areas, especially where the lines cross the Rio Grande River corridor in New Mexico, a critical bird migration route.

#### **IV. Issues for Further Analysis**

##### **A. Protection of Lands with Wilderness Characteristics**

The public lands being considered for this project contain lands that have wilderness characteristics and are under consideration for protection under the Wilderness Act, 16 U.S.C. § 1131-1136, or under specific administrative prescriptions. Both of these categories of lands require special management; they should be carefully identified and protected from the impacts of transmission.

##### **i. BLM Must Inventory for and Protect Lands with Wilderness Characteristics outside WSAs**

BLM has committed to continuing to protect wilderness values in the wake of the Utah Settlement, in which the BLM abandoned its authority to establish new Wilderness Study Areas (WSAs). We maintain this settlement is invalid and will be overturned in litigation; however, the agency has other obligations to identify and protect wilderness characteristics. Instruction Memoranda (IMs) Nos. 2003-274 and 2003-275 contemplate that BLM can continue to inventory for and protect land “with wilderness 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. (emphasis added). The guidance issued by the BLM’s Arizona State Office serves to elaborate upon this guidance by providing for identification of lands with wilderness characteristics and development of management prescriptions to protect and enhance these values (See IM No. AZ-2005-007).

Construction of power lines will unquestionably affect the wilderness characteristics of these lands, since they will affect their “naturalness” as well as opportunities for solitude and/or opportunities for primitive or unconfined recreation. FLPMA specifically identifies “scenic values” as a resource of BLM lands for purposes of inventory and management (43 U.S.C. § 1711(a)), and the unspoiled landscapes of lands with wilderness characteristics generally provide spectacular viewing experiences. The scenic values of these lands will be severely compromised if destructive activities or other visual impairments are permitted.

“[W]ilderness characteristics are a value which, under the FLPMA, the Bureau has the continuing authority to manage, even after it has fulfilled its 43 U.S.C. § 1782 duties to recommend some lands with wilderness characteristics for permanent congressional protection.” *Oregon Natural Desert Ass’n v. Bureau of Land Management*, 531 F.3d 1114, 1142 (9th Cir. 2008). Pursuant to FLPMA, “The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. 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). Wilderness character is a resource for which BLM must keep a current inventory. As the U.S. Court of Appeals for the Ninth Circuit recently held: “wilderness characteristics are among the ‘resource and other values’ of the public lands to be inventoried under § 1711. BLM’s land use plans, which provide for the management of these resources and values, are, again, to ‘rely, to the extent it is available, on the inventory of the public lands, their resources, and other values.’ 43 U.S.C. § 1712(c)(4).” *Oregon Natural Desert Ass’n v. Bureau of Land Management*, 531 F.3d 1114, 1119 (9<sup>th</sup> Cir. 2008). Therefore, BLM is required to consider “whether, and to what extent, wilderness values are now present in the planning area outside of existing WSAs and, if so, how the Plan should treat land with such values.” *Id.* at 1143.

BLM has identified “wilderness characteristics” to include naturalness and providing opportunities for solitude or primitive recreation. *See* Instruction Memoranda 2003-274, 2003-275, Change 1. These values are to be *identified and protected* in the land use planning process. *See* BLM Land Use Planning Handbook (H-1601-1, 2005); *Oregon Natural Desert Ass’n v. Bureau of Land Management*, *supra*. Further, BLM’s national guidance provides for management emphasizes “the protection of *some or all* of the wilderness characteristics as a priority” over other multiple uses. IM 2003-275, Change 1 (emphasis added). 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 5,000-acre parcels or a requirement that the lands have *all* of the potential wilderness characteristics in order to merit protection.

In addition, where the BLM has not inventoried its lands for wilderness characteristics, the agency is obligated to consider substantive new information regarding wilderness character. In *Oregon Natural Desert Association v. Rasmussen*, CV 05-1616-AS, Findings and Recommendations (D. Or. April 20, 2006); Order (D.Or. Dec. 12, 2006), the court found that BLM had violated NEPA by failing to consider significant new information on wilderness values and by relying on its previous wilderness inventory, concluding:

The court finds BLM did not meet its obligation under NEPA simply by reviewing and critiquing [a local environmental group’s] work product. It was obligated under NEPA to consider whether there were changes in or additions to the wilderness values within the East-West Gulch, and whether the proposed action in that area might negatively impact those wilderness values, if they exist.

**The court finds BLM did not meet that obligation by relying on the one-time inventory review conducted in 1992.**

Where wilderness inventory information submitted has not yet been analyzed in the existing land use plan, it must be considered before making other management decisions, such as authorizing a new transmission line. 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) (also submitted with our comments on the Draft RMP). 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 RMPs governing the lands at issue for this project have not completed re-inventories for wilderness characteristics. The Socorro Field Office published its Proposed RMP/Final EIS in December 2008. The EIS identifies lands with wilderness characteristics outside of designated WSAs that will be managed to protect these characteristics (Proposed RMP at 2-13). To fulfill this management direction, the SunZia project should not impact these lands or their wilderness values. Further, although the Socorro RMP evaluated the wilderness characteristics of newly-acquired lands, it did not evaluate the wilderness inventory prepared by the New Mexico Wilderness Alliance and submitted during the planning process.

The Las Cruces District Office is currently in the process of preparing the Tri-County Draft RMP/EIS, which also governs lands in the study area. As part of this process, BLM is required to inventory for wilderness characteristics, including giving consideration to information about wilderness-quality lands provided by the public. The same information is applicable to consideration for locating the SunZia project.

The Safford and Tucson Field Offices have neither recently revised their RMPs (although the Tucson RMP has been scheduled to begin revision for a number of years), nor completed inventories for lands with wilderness characteristics. Lands in these field offices that are considered for the SunZia project should also be inventoried for wilderness characteristics, to ensure wilderness values are not impacted, including use of the inventory information provided by the Arizona Wilderness Coalition (GIS data attached).

The Draft EIS should acknowledge the wilderness values present on the affected lands and consider the impacts of locating transmission lines on or adjacent to them.

As currently identified, the proposed and alternate routes intersect several Citizens' Proposed Wilderness areas inventoried by the New Mexico Wilderness Alliance and Citizens' Wilderness Inventory areas inventoried by the Arizona Wilderness Coalition. Some of these intersections appear to be on the extreme edges of the units, and can likely be avoided with simple route shifts. Other intersections go directly through units, and will be more difficult to address. BLM should address these intersections in the EIS and SunZia should avoid intersections with these areas. Intersected units include:

New Mexico:

- Antelope
- Antelope South
- Big Yucca North
- Big Yucca
- Brushy Mountain
- Chupadera Wilderness Addition
- Dugout Canyon
- Gyp Hills
- Jornada del Muerto
- Lordsburg Playas North
- Massacre Peak
- Padilla Gonzales
- Point of Rocks
- Nutt Mountain
- Sierra de las Uvas

Arizona:

- Whitlock Mountains
- Winchester

**Recommendations:** Lands with wilderness characteristics must not be adversely impacted by the SunZia project. The project should not be sited in or adjacent to 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 this project. The BLM should specifically consider the significant new information encompassed by the wilderness inventories prepared by the New Mexico Wilderness Alliance and Arizona Wilderness Coalition that address lands in the study areas, which are provided with these scoping comments (GIS data attached, along with narratives for New Mexico units).

**i. The SunZia project Cannot be Located in Wilderness Study Areas**



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 be managed to protect their wilderness values. The IMP requires management of 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)

**Recommendations:** In order to fulfill the mandates of the IMP, the SunZia project cannot be located in WSAs and the location of the SunZia project must show that it does not impair wilderness suitability.

## **B. Amendment of RMPs**

The Scoping Notice acknowledges that approval of the SunZia project may require amendment of one or more of the affected RMPs. Per FLPMA and its implementing regulations, "a resource management action [must] be specifically provided for in the [RMP], or if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan or plan amendment." 43 C.F.R. § 1601.0-5(b). An amendment is needed if there is "a change in circumstances or a proposed action that may result in a change in the scope of resource uses or a change in the terms, conditions and decisions of the approved plan." 43 C.F.R. § 1610.5-5.

NEPA requires the BLM to include within an EIS "alternatives to the proposed action." 42 U.S.C. § 4332(2)(C)(iii). NEPA also requires that BLM discuss mitigation measures to avoid or minimize environmental consequences from proposed actions in an EIS. 40 C.F.R. §§ 1502.14, 1502.16. NEPA's implementing regulations underscore this requirement by requiring agencies to "[r]igorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14(a). This evaluation extends to considering more environmentally-protective alternatives and mitigation measures. See, e.g., 40 C.F.R. § 1505.2(b); 40 C.F.R. § 1502.14(f).

We appreciate the agency's acknowledgment that the construction and resulting impacts from the SunZia project may merit amendment of the subject RMPs and hope that the BLM will ensure that protection of the many values of the affected public lands are thoroughly addressed.

**Recommendations:** Given the age of the affected RMPs, the circumstances under which these RMPs were originally prepared have certainly changed and the evaluation of the SunZia project provides an important opportunity to ensure that new circumstances and new data are addressed. Where the subject RMPs are under revision, data collected on sensitive resources and protective management prescriptions already identified should be carried forward. New information, including inventories of lands with wilderness values,

should be considered. Opportunities to protect the natural resources of these public lands should be considered and incorporated into the EIS and RMP amendments, including by designation of special management areas and application of protective management prescriptions.

### **C. Preserving Opportunities for Recreation**

Many lands in the SunZia study area are valued by public lands users for their opportunities for recreation. FLPMA identifies “outdoor recreation” as a valuable resource to be inventoried and managed by BLM. 43 U.S.C. § 1711(a), and the field offices impacted by this project administer areas specially managed for recreational uses. Outdoor experiences such as hiking, hunting, fishing, and biking can be negatively impacted by the degradation of scenic values.

On BLM lands, the public wants to experience a variety of recreational opportunities including naturalness, quiet natural soundscapes, undeveloped scenery, an undisturbed natural landscape, the timelessness and geological sweep of the BLMs remote and rugged landscapes, a low level of facilities presence, and opportunities for solitary experiences. Many want to be able to recreate in primitive, undeveloped, natural appearing settings. BLM should ensure that opportunities for experiences such as these are preserved in selecting a location for the SunZia project.

**Recommendations:** BLM manages public lands to accommodate a wide range of uses, including many recreation settings. Recreational values and uses should be considered in preserved in siting the SunZia transmission line.

### **D. Accounting for Cumulative Impacts and Connected Actions in the Scope of the Environmental Analysis**

#### **i. Benefits for Greenhouse Gas Reductions and Climate Change**

Addressing climate change begins with reductions of greenhouse gas emissions. This cannot be achieved without well-planned transmission connecting new renewable energy sources to load centers. A reduction in GhG emissions from developing renewable energy is based on comparative emissions from fossil fuel-based energy production. The proposed SunZia transmission line is a very important step toward facilitating greater renewable energy development to meet national clean energy goals and state renewable energy portfolios.

Under FLPMA, BLM is directed to act consistently with state policies by “coordinating the land use inventory, planning and management activities of or for such lands . . . of the states or local governments within which the lands are located.” 43 U.S.C. §1712(c). Arizona and New Mexico have renewable portfolio standards that mandate a certain percentage of generation to come from renewable energy, 15% by 2025 and 20% by 2020, respectively.

FLPMA also requires BLM to “provide for compliance with applicable pollution control laws including state . . . pollution standards[.]” 43 U.S.C. §1712(c)(8), (c)(9); 43 C.F.R. §2920.7(b)(3). In addition to supporting state renewable energy portfolios, the SunZia line could also serve as an important asset for pushing forward state and regional policies to reduce greenhouse gas emissions. Through executive order 2006-69, the New Mexico Governor set an emission reduction target to meet 2000 levels by 2020. Arizona, with the fastest growing emissions rate of any state in the United States, targets the same GHG reduction schedule as New Mexico in their state climate action plan.

Furthermore, both states in the SunZia path are members of the Western Climate Initiative, a multi-state climate registry targeting emissions reduction goals and developing a cap-and-trade system. Arizona and New Mexico are also members of the Southwest Climate Change Initiative, through which the Governors of both states have committed to identify and utilize opportunities for reducing GHG emissions. BLM planning and the SunZia transmission line could serve an integral role in meeting the goals outlined by these initiatives.

Because a reduction in GhG emissions is a primary public benefit of transmission development to facilitate renewable energy projects, it is critical that the agencies quantify this reduction to the extent possible. The agencies’ analysis of GhG reductions should also include a comprehensive look at both SunZia’s impacts, along with impacts from reasonably foreseeable renewables projects development facilitated by SunZia, including GhG emissions during manufacture, construction, operation, decommissioning, and reclamation of the projects.

The results of this analysis should then be compared to similar analyses for fossil-fuel based energy production, including combined-cycle natural gas fired and coal fired power plants.

Such an analysis will provide the public a clear indication of the costs and benefits of the proposed project and allow stakeholders to make decisions regarding the project based on the best available science and data.

## **ii. Cumulative and Connected Impacts**

The EIS must account for cumulative and connected actions associated with the proposed transmission line. Under NEPA, BLM must take a “hard look” at the effects of proposed actions, including, “ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.” 40 C.F.R. § 1508.8. A cumulative impact may be “an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.” 40 C.F.R. § 1508.7.

BLM should account for any future possibility that the SunZia transmission line carries non-renewable energy sources, such as coal, that produce greater GHG emissions. Department of the Interior Secretarial Order 3226, as amended in 2001, requires BLM to

“consider and analyze potential climate change impacts. . . . when making major decisions.” Federal case law also underscores the responsibility of federal agencies to scrutinize reasonably foreseeable cumulative environmental impacts from carbon dioxide emissions involving coal-fired power generation through the NEPA review process. *See Mid-states Coalition for Progress v. Surface Transportation Board* 345 F.3d 520 (8<sup>th</sup> Cir. 2003) (finding NEPA violation by failing to consider emissions from increased coal consumption from new rail lines carrying coal); *Border Power Plant Working Group v. Department of Energy* 260 F.Supp.2d 997 (S.D. Cal. 2003) (finding NEPA violation for failure to analyze reasonably foreseeable cumulative impacts from carbon dioxide with proposed transmission lines). In accordance with these decisions, and due to reasonably foreseeable GHG emissions and environmental impacts from power lines supporting coal-fired generation, BLM should consider options for allowing interconnection from only low-carbon generation (equal to or less than that of a combined-cycle natural gas fired power plant).

On the ground impacts are also important to consider when assessing cumulative and connected actions. Surface disturbance from the transmission lines should be considered in the EIS and minimized to the greatest extent possible. The need for new infrastructure to accommodate construction workers could be reduced or eliminated by giving special attention to where opportunities exist to utilize pre-existing roads or housing in close proximity to project locations.

SunZia will also provide transmission access to wind, solar and possibly geothermal generation plants that would otherwise not be feasible. The EIS should analyze the potential cumulative impacts of any reasonably foreseeable development of these resources.

**Recommendations:** The SunZia project proposes to utilize federal public lands – 211 of the planned 460 miles are on federal public lands. BLM should take measures to ensure that use of our public lands and the SunZia rights-of-way support a forward-thinking energy policy and current policy objectives that favor clean, renewable energy generation such as wind, solar and geothermal resources. BLM should ensure this by considering options for allowing interconnection from only low-carbon generation (equal to or less than that of a combined-cycle natural gas fired power plant). BLM should also require the applicant to thoroughly examine and provide a report in the Draft EIS, various tariff structures for the proposed power lines with the Federal Energy Regulatory Commission (FERC), in such a way to favor/limit interconnection to low-carbon resources while also not charging a premium for transmission access.

There are presently 120,000 linear miles of high-voltage power lines in the West that already impact a significant amount of public lands. We understand that – in many instances – location-constrained renewable energy resources need new transmission investments to develop and deliver these resources to market. These new power lines and attendant rights-of-way, including SunZia, however, will unavoidably create additional impacts to our nation’s public lands. These additional impacts are only acceptable – in addition to siting, mitigation and the environmental concerns herein being addressed – if

the approved projects advance the region towards a forward-thinking energy policy, and are therefore limited to low-carbon resources and predominantly serve wind, solar and geothermal resources.

Importantly, BLM has the ability to set reasonable conditions of approval for rights-of-way on public lands. Section 505 of the Federal Land Management Policy Act provides that each right-of-way shall contain:

- (a) terms and conditions which will . . .
  - (ii) minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment;
  - (iii) require compliance with *applicable air* and water quality standards established by or pursuant to applicable Federal or State law; and
  - (iv) require compliance with State standards for public health and safety, environmental protection, and siting, construction, operation, and maintenance of or for rights-of-way for similar purposes if those standards are more stringent than applicable Federal standards; and
- (b) such terms and conditions as the Secretary concerned deems necessary to . . .
  - (ii) manage efficiently the lands which are subject to the right-of-way or adjacent thereto and protect the other lawful users of the lands adjacent to or traversed by such right-of-way;
  - (iii) protect lives and property;
  - (iv) protect the interests of individuals living in the general area traversed by the right-of-way who rely on the fish, wildlife, and other biotic resources of the area for subsistence purposes;
  - (v) require location of the right-of-way along a route that will cause least damage to the environment, taking into consideration feasibility and other relevant factors; and
  - (vi) otherwise protect the public interest in the lands traversed

43 U.S.C. § 1765 (emphasis added).

As noted above, there is precedent in the controlling law (FLPMA) that allows for air quality to be a valid consideration in terms of conditioning a ROW permit to protect the public health, air quality and environmental concerns such as global warming. Therefore, in the DEIS BLM should consider conditioning the right-of-way approvals to ensure that each new connecting power source does not exceed the CO<sub>2</sub> and other emissions of a combined-cycle natural gas plant (roughly 1,100 lbs. of CO<sub>2</sub> per megawatt-hour of produced energy).<sup>4</sup>

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<sup>4</sup> This standard is derived from the 2007 decision of the California Public Utilities Commission setting a green house gas performance standard for new long-term commitments for base-load energy generation serving California consumers. See “PUC Sets GHG Emissions Performance Standard to Help Mitigate Climate Change” attached as Exhibit \_\_\_\_.

In Border Power Plant v. Dept. of Energy, 260 F.Supp.2d 997 (S.D. Cal. 2003), the projects under immediate consideration for approval were federal rights-of-way to build power lines connecting coal power plants in Mexico with the power grid in Southern California. To help ensure that the connecting power plants would have the least impacts on regional air quality, the plaintiffs in Border Power Plant advanced a novel theory: condition the right-of-way permits “on the commitment of the project proponents to implementation of state-of-the-art emissions control systems, mitigation through offsets in existing sources, and the use of dry cooling or parallel dry-wet cooling.” Border Power Plant, 260 F.Supp.2d at 1029. The defendant permitting agencies argued that such a condition would frustrate the purpose and need of the proposed action, which only dealt with the construction of power lines in a right-of-way and not the operation of the connecting power plants.

The court agreed with the plaintiffs, and its analysis is worth quoting in full:

Here, the scope of the action relates only to the transmission lines, but the nature of the action includes the full scope of the analysis, including the effects of the action. The nature of the action therefore includes the importation of power generation in Mexico. Indeed, to leave out the secondary impacts would be at odds with the purpose of the alternatives analysis, which is to provide a way for an agency to calculate and compare the various predicted effects of alternative courses of action. The analysis would be arbitrary in itself if it did not take into account all effects of a proposed action. Accordingly, defendants’ arguments that they need not consider alternatives related to the [coal power plant] facilities fails.

Given this nature, the agencies were obligated to set forth in the EA ‘the range of alternatives . . . sufficient to permit a reasoned choice.’ Although defendants argue that ‘international sensitivities’ preclude conditioning the permits from being a reasonable and feasible alternative, such a discussion belongs in the EA’s alternative analysis rather than a litigation brief.

Border Power Plant, 260 F.Supp.2d at 1030-31 (citations omitted).

Accordingly, there is judicial precedent for the proposition that NEPA approval processes for rights-of-way that will house power lines should consider alternatives that place performance-based conditions on the right to use public lands. For the SunZia project, we ask BLM to develop this type of permit condition in order to ensure that America’s public lands are being used to support a forward-thinking energy policy and are furthering climate change solutions. Fuel-neutral, a performance standard is an appropriate condition for the use of the country’s public lands and allows the public assurances that support for a particular corridor or right-of-way will not result in future actions connecting polluting and carbon-heavy power sources to the electric grid. Cumulative and connected actions, such as potential benefits from reducing greenhouse gas emissions from electricity generation, decreased impacts from climate change, and

potential impacts from additional infrastructure and reasonably foreseeable development of renewable energy generation plants, should be accounted for in the Draft EIS.

Further, the agencies should comprehensively analyze SunZia's net reductions to GhG emissions, including GhG emissions during manufacture, construction, operation, decommissioning, and reclamation SunZia and reasonably foreseeable renewable energy development facilitated by SunZia. The analysis should consider both the potential for the project to reduce GhG emissions as well as potential for the project to increase GhG emissions, for example, by disturbing undisturbed land currently useful for carbon sequestration. The results of this analysis should then be compared to the same type of analysis for fossil-fuel based energy production, including combined-cycle natural gas fired and coal fired power plants.

#### **E. Socioeconomic Impacts**

These comments refer to type and scope of socioeconomic analyses which should be performed as part of the BLM Environmental Impact Statement and Resource Management Plan Amendments for the SunZia Southwest Transmission Project (SunZia EIS).

The socioeconomic impacts of transmission for potential renewable 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 advancing our national quest for renewable energy and our important goal of reducing global warming pollutants, transmission for renewable energy (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 this proposed transmission project are likely to include places which are important and valuable to all Americans. Development of these lands for energy transmission should be considered carefully and should account for all their potential values – both market and non-market.

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

- I. In assessing the benefits of this transmission project, the BLM account for all the potential costs and benefits associated with such development.
  - A. The SunZia EIS should address the potential benefits to the local area economies that arise from undeveloped public lands, and which will be impacted by the development of the SunZia transmission project.
  - B. All opportunity costs of energy transmission on public lands, including potential economic benefits from job creation for transmission and renewables development, revenue from energy generation, and climate benefits, along with negative opportunity costs from loss of other opportunities and values on public lands, should be fully examined in the SunZia EIS to ensure that net socioeconomic value of the transmission project is maximized.

- C. The SunZia EIS should include an assessment of the potential benefits of siting transmission for utility scale renewable energy projects on private lands compared with this development on public lands. The potential fiscal returns to the American public from siting transmission on public lands should be compared with the potential fiscal benefits that might accrue to a private landowners through siting transmission on private lands (ROW, rental fees)
  - D. The SunZia EIS should consider the benefits as well as mitigation of costs by siting energy transmission on Brownfields. By avoiding costs to the ecological integrity and outdoor opportunities, the net benefits of siting the transmission project on contaminated lands may be considerable.
- II. The SunZia EIS 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 the development of this transmission project.
  - III. The socioeconomic analysis in the SunZia EIS should avoid the use IMPLAN and economic base models to assess the economic impacts of the proposed energy transmission project 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 include an assessment of the potential impacts of this transmission project on all segments of the local economies (non-labor income, amenity driven development, tourism, etc) along with impacts to residential and other private property values.

**i. Energy Transmission Development Should Maximize Net Public Benefits**

In developing the socioeconomic analysis for energy transmission projects on public lands, the BLM 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 SunZia EIS will recognize that energy transmission for renewable 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 renewable 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. Any energy transmission projects (even



those targeting renewable energy) sited on undeveloped lands (both public and private) will reduce these benefits. These costs should be included in the SunZia EIS's assessment of net public benefits.

The SunZia EIS should recognize that this transmission project will result in public benefits and costs. The siting and development of the transmission project should be done such that it will 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.

### **1. Benefits to the Local Economy from Undeveloped Public Lands**

The SunZia EIS should address the potential benefits to the local area economies that arise from undeveloped public lands which may be impacted by the development of the proposed transmission project. The mere presence of undeveloped public lands and the natural and recreational amenities that they provide produce measurable economic benefits for local communities.

The SunZia EIS should fully address the impacts that the development of energy transmission corridors 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.<sup>5</sup> 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 or other development on public lands. Some are dependent directly on the recreation opportunities on the surrounding public lands. Entrepreneurs are also

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<sup>5</sup> 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.

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 renewable energy developments. The SunZia EIS 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 renewable energy developments and any associated transmission lines are constructed.

Retirees and others who earn non-labor income are also important to rural western communities. Investment and retirement income makes up 26% of total personal in New Mexico and 28% in Arizona.<sup>6</sup> If investment and retirement income were considered an industry it would be one of the largest in both states potentially impacted by the proposed transmission project. Retirees are attracted by natural amenities that are available on undeveloped public lands. The potential impact that the development of energy transmission will have on this source of income and economic activity must be accounted for in the SunZia EIS.

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 (Center for the Study of Rural America 2006a). These indicators include the natural and human amenities of a region – many of which are closely tied with undeveloped public lands (Weiler 2004). Both states impacted by the proposed SunZia transmission 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 these states' economies and the potential impact that energy transmission development might have should be addressed in the SunZia EIS.

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 energy transmission project on undeveloped public lands may hinder the

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<sup>6</sup> Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (<http://www.bea.gov/>)

impacted 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. Inappropriate development of the proposed energy transmission project on these western lands could be seriously problematic, and this must be addressed in the SunZia EIS. To site transmission, even for renewable energy development, in a way that impairs these natural amenities would be short-sighted at best. The SunZia EIS should address this issue and provide detailed criteria to protect the economic benefits associated with undeveloped public lands.

**Recommendations:** The SunZia EIS must include a thorough examination of the full socioeconomic impacts likely to occur if the proposed energy transmission project impacts 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).

## 2. Opportunity Costs

The stated purpose of the SunZia Transmission Project is to facilitate the development of renewable energy and this intention should be adhered to. All relative costs of energy production and transmission on public lands should be fully examined in the SunZia EIS, 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 transmission is constructed on lands that hold special value to people, wildlife, and other elements of the ecosystem. These costs should be assessed by the BLM for the entire proposed transmission development corridor.

However, it is also true that local communities can certainly benefit from the presence of new renewable power-generating and transmission infrastructure. Temporary jobs are created to manufacture transmission lines and to construct the new power facilities that the transmission will support. 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.

<b>Table 1. Annual Jobs Created Per Megawatt of Generating Capacity</b>		
Energy Source	Temporary Jobs(per MW)	Permanent Jobs(per MW)
Solar-PV <sup>a</sup>	1.2 <sup>1</sup> -33 <sup>3</sup>	0.25 <sup>1</sup> -2.5 <sup>3</sup>
Solar-CSP <sup>b</sup>	3.25 <sup>4</sup> -10 <sup>5</sup>	0.275 <sup>4</sup> -1.0 <sup>5</sup>
Central Solar*	3.42 <sup>2</sup>	1.62 <sup>2</sup>
Wind	0.15 <sup>1</sup> -0.88 <sup>1</sup>	0.1 <sup>1</sup>
Coal	0.21 <sup>1</sup> -3.57 <sup>4</sup>	0.5 <sup>4</sup> -0.59 <sup>1</sup>
IGCC Coal	2.54 <sup>6</sup>	0.36 <sup>6</sup>
Gas	0.21 <sup>1</sup>	0.6 <sup>1</sup>
a) PV: Photovoltaic b)CSP: Concentrated Solar Power *Central Solar makes use of both PV and CSP technologies <sup>1</sup> Daniel M. Kammen, Kamal Kapadia, and Matthias Fripp (2004) <i>Putting Renewables to Work: How</i>		

*Many Jobs Can the Clean Energy Industry Generate?* RAEI Report, University of California, Berkeley. P. 10.

<sup>2</sup> Navigant Consulting, Inc. estimates, June 2006.

<sup>3</sup> Clean and Diversified Energy Initiative. Solar Task Force Report. January, 2006. Western Governors' Association.

<sup>4</sup> Suemedha Sood. *Harnessing the Sun: The Future of Green Jobs*. April 11, 2008. The Washington Independent. <http://washingtonindependent.com/view/harnessing-the-sun>

<sup>5</sup> Dr. Franz Trieb. Powerpoint: *Concentrating Solar Power Now: Clean Energy for Sustainable Development*. German Aerospace Center. P. 11. 2007

<sup>6</sup> 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 Gassification 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.<sup>7</sup> 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 or wind power is likely to have higher net public benefits when the impacts associated with lower pollution levels are also considered.

The absence of harmful effluence is another serious benefit of implementing renewable 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 CO<sub>2</sub> and thousands of tons of other effluent.<sup>8</sup> Natural gas combined cycle plants are one of the leading "clean" fossil fuel-based energy producers. Still, they emit about 1900 tons of CO<sub>2</sub>, 0.045 tons of CO, and 0.075 tons of NO<sub>x</sub> per MW of total capacity.<sup>9</sup> IGCC coal facilities boast near-zero emissions from the technologies they implement. CO<sub>2</sub> effluence is largely eliminated, and SO<sub>2</sub> and NO<sub>x</sub> 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 CO<sub>2</sub>, 9.2 tons SO<sub>2</sub>, 11.2 tons NO<sub>x</sub> is avoided.<sup>10</sup>

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<sup>7</sup> EnergyJustice.net. Fact Sheet: "Clean Coal" Power Plants (IGCC).  
<http://www.energyjustice.net/coal/igcc/factsheet-long.pdf>

<sup>8</sup> Environmental Impacts of Coal Power: Air Pollution. Union of Concerned Scientists. August 18, 2005.  
[http://www.ucsusa.org/clean\\_energy/coalvswind/c02c.html](http://www.ucsusa.org/clean_energy/coalvswind/c02c.html)

<sup>9</sup> 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.

<sup>10</sup> Concentrated Solar Power. American Solar Energy Society, Solar Electric Division.  
[www.ases.org/divisions/electric/facts\\_csp.pdf](http://www.ases.org/divisions/electric/facts_csp.pdf)

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.<sup>11</sup>

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.<sup>12</sup> IGCC plants may be worse, requiring up to 2500 gallons every minute.<sup>13</sup> Even if significant water recycling is performed, the need still adds up. Furthermore, both traditional and IGCC coal facilities release waste water. Even if this waste water complies with EPA standards, contaminants are still released into natural water systems.<sup>14</sup> Depending on the type of development, solar projects can use more or less water. Parabolic trough and central tower systems both use steam to power a conventional generator. These types of plants can either be “wet cooled” with water or “dry cooled” with air. Using up to 1,000 gallons per MWh, wet cooled plants equal or even exceed water intensive nuclear and coal plants – see Table 1 on page 7.. Though they are slightly less efficient, dry-cooled plants are preferable in many arid solar development areas as wet cooled plants have the potential to strain water resources. In addition to using dry-cooling, another potential solution to water concerns is to site CSP arrays on degraded agricultural lands that retain their water rights.

**Table 1. Water Use by Power Plant Type<sup>15</sup>**

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<sup>11</sup> 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](http://www.earth-policy.org/Updates/2008/Update70_data.htm)

<sup>12</sup> Environmental Impacts of Coal Power: Water Use. Union of Concerned Scientists. August 18, 2005. [http://www.ucsusa.org/clean\\_energy/coalvswind/c02b.html](http://www.ucsusa.org/clean_energy/coalvswind/c02b.html)

<sup>13</sup> Frequently Asked Questions. FutureGen Alliance, Inc. 2006. <http://www.futuregenalliance.org/faqs.stm>

<sup>14</sup> EnergyJustice.net. Fact Sheet.

<sup>15</sup> Unless otherwise noted, the reference for data in this table is: *Fuel from the Sky: Solar Power's Potential from Western Energy Supply*, Dr. Arnold Leitner, Senior Consultant, RDI Consulting, NREL/SR-550-32160. July 2002. p. 34 <http://www.nrel.gov/csp/pdfs/32160.pdf>

Power Plant Type	Water Use (Gallons/MWh)
Nuclear	620
Coal	670
Combined Cycle Natural Gas	250-300
Parabolic Trough (Wet Cooled) <sup>16</sup>	1,000
Parabolic Trough (Dry Cooled) <sup>17</sup>	80
Dish/Stirling	4.4
Photovoltaic (PV)	4.4

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 <sup>7</sup> -12.36 <sup>7</sup>
Solar-CSP	5.0 <sup>10</sup> -12.33 <sup>8</sup>
Wind	24.71 <sup>7</sup> -50 <sup>9</sup>
Coal	0.35 <sup>9</sup> -1.1 <sup>11</sup>
IGCC Coal	1.31 <sup>12</sup> -2.36 <sup>12</sup>
Gas	0.29 <sup>13</sup> -0.41 <sup>13</sup>

<sup>7</sup> PV FAQ's. U.S. Department of Energy, Energy Efficiency and Renewable Energy. National Renewable Energy Laboratory. ([www.hubbertpeak.com/Apollo2/photovoltaics/HowMuchLandNREL.pdf](http://www.hubbertpeak.com/Apollo2/photovoltaics/HowMuchLandNREL.pdf))

<sup>8</sup> Concentrating Solar Power: From Research to Implementation. European Commission. European Communities, 2007. ([ec.europa.eu/energy/res/publications/doc/2007\\_concentrating\\_solar\\_power\\_en.pdf](http://ec.europa.eu/energy/res/publications/doc/2007_concentrating_solar_power_en.pdf))

<sup>9</sup> 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>)

<sup>10</sup> 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](http://solareis.anl.gov/documents/docs/NREL_CSP_1.pdf))

<sup>11</sup> 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>)

<sup>12</sup> Final Site Selection Report. FutureGen Industrial Alliance, Inc. Submitted to Department of Energy, Dec. 18, 2007.

<sup>13</sup> 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>)

<sup>16</sup> U.S. Department of Energy Energy Efficiency and Renewable Energy. "Cooling for Parabolic Trough Power Plants." 2006. <http://www.nrel.gov/csp/troughnet/pdfs/40025.pdf>

<sup>17</sup> Ibid.

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.<sup>18</sup> Without considering all of the costs behind every unit of power produced, any analysis of costs and benefits is insufficient.

The SunZia Transmission Project should focus primarily on the transmission of new renewable energy rather than fossil fuel energy. We recognize that some open lands may be developed for this project and this development should be done in such a way that maximize the net public benefits. It is clear when the environmental costs of fossil energy are considered that net public benefits will be higher with renewable energy.

Furthermore, regardless of the type of facility, there are some means of abating the costs of installing energy transmission. Undeveloped lands may be worth considerably more for recreational purposes and the ecosystem than are lands that have already been disturbed from their natural states. Therefore, 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 the proposed energy transmission results in maximum net public benefits, the analysis of this development in the SunZia EIS must account for the all opportunity costs. This includes the costs associated with siting utility-scale renewable 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 and the proposed transmission should adhere to its stated purpose and favor renewable energy transmission over fossil fuel energy.

### **3. Benefits of Siting on Brownfields**

There are millions of acres of contaminated lands in the U.S.<sup>19</sup> Serious potential exists for installing new renewable power generation and the associated transmission, such as that proposed in the SunZia EIS, on these lands.

While we recognize that the siting of particular power generating facilities is outside the scope of the SunZia EIS, the analysis of the connected actions should account for the location of the renewable energy this transmission is proposed to support. 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.

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<sup>18</sup> Data Tables and Figures. 2006 Annual Report. OSM/DOI Strategic Plan Measures. Office of Surface Mining. 2006. <http://www.osmre.gov/annualreports/06AR11.pdf>

<sup>19</sup> 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/>

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.<sup>20</sup> 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.<sup>21</sup>

Installing renewable power transmission 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.<sup>22</sup>

**Recommendations:** The SunZia EIS should include an analysis of the relative benefits of siting the proposed energy transmission (and the concurrent energy generation) 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.

#### **ii. Non-Market Values Should be Included in the Economic Analysis**

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 SunZia EIS must account for the non-market values associated with undeveloped wild lands. The BLM has 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 BLM to estimate the potential value of these lands where the SunZia energy transmission is proposed. Krutilla (1967) provides a seminal paper on the

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<sup>20</sup> Ibid.

<sup>21</sup> 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>

<sup>22</sup> Land-Based Initiatives and Climate Change. 2007.



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, BLM should adapt these methods to conditions in the impacted areas in New Mexico and Arizona to obtain a complete estimate of the economic consequences of the proposed transmission development.

The socioeconomic analysis in the SunZia EIS must also adequately address the potential impacts on the quality of life for residents of communities that will be impacted by the transmission 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 transmission 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 SunZia EIS must measure and account for changes in non-market values associated with the proposed energy transmission development. To do otherwise omits a very important socioeconomic impact that would directly result from this development. The analysis must assess the non-market economic impacts to all Americans, including the passive use values of undeveloped public lands.

The SunZia EIS must also include an assessment of impacts on the local quality of life that are may result from the development of energy transmission 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.

### **iii. Recommended Methods for Socioeconomic Analysis**

#### **1. Economic Base Models**

The use of economic base models such as IMPLAN is insufficient to predict future economic impacts from the development of energy transmission facilities. While these models can be useful as a tool to develop static analyses of the regional economy, the BLM 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 SunZia EIS not rely solely on IMPLAN or on other models derived from economic base theory to predict the economic impacts of energy transmission 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.

## **2. 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.<sup>23</sup> 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 energy transmission facilities are sited on such lands. Numerous studies show that there is a positive correlation between property values and open spaces and protected public lands. 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. Given that the proposed energy transmission development will impact public land and open space throughout the area, it is likely to have negative impacts on the property values in New Mexico and Arizona.

**Recommendations:** The SunZia EIS should include an examination of the impacts of the development of the proposed energy transmission on residential and other property values. The agencies should make a quantitative assessment of these potential impacts.

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<sup>23</sup> Several examples of studies of the impact of open space on property values 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).

## **F. Right of Way Terms and Conditions**

### **i. 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.

### **ii. 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 transmission 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 roadways and sources of other necessary resources;
6. minimize the overall size of the project;
7. include avian protection plans (*see* [www.aplic.org](http://www.aplic.org));
8. periodically assess feasibility of incorporating technological advances that improve efficiency and/or reduce impacts on wildlife and other natural resources.

### **iii. 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 Draft EIS and incorporated into all ROWs and plans of development where applicable.

Thank you for your consideration of these comments.

Sincerely,

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### **Attachments and References**

#### **Attachments**

Attachment 1: GIS data and explanatory excel spreadsheet for Arizona Wilderness Coalition's Citizens' Wilderness Inventory areas; GIS data and explanatory excel spreadsheet for New Mexico Wilderness Alliance Citizens' Wilderness Proposal areas.

Attachment 2: Detailed narratives for New Mexico Wilderness Alliance Citizens' Wilderness Proposals in the SunZia project area.

Attachment 3: The Wilderness Society. 2006. *Socio-Economic Framework for Public Land Management Planning: Indicators for the West's Economy* Washington DC: The Wilderness Society.

#### **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](http://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. July 1, 2008. Ivapah 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](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](http://www.kansascityfed.org/RegionalAffairs/Indicators/Creative%20Workers_706.pdf)
- Cordell, H.K., M.A. Tarrant, B.L. McDonald and J. C. Bergstrom. 1998. How the public views wilderness: More results from 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](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](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)
- Freeman, A.M. III, 2003, *The Measurement of Environmental and Resource Values*, 2<sup>nd</sup> 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](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, University of California, Berkeley. P. 10.( <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf>, accessed July 9, 2008)
- 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.
- 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.
- 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%202015.ppt#486,2,Land-Based Opportunities](http://www.narucmeetings.org/Presentations/NARUC%20Pres%20July%202015.ppt#486,2,Land-Based%20Opportunities), 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).
- 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)
- 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](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](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.
- 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.hubbartpeak.com/Apollo2/photovoltaics/HowMuchLandNREL.pdf](http://www.hubbartpeak.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](http://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>