



NATURAL RESOURCES DEFENSE COUNCIL

**COMMENTS OF NRDC
BEFORE THE CALIFORNIA ENERGY COMMISSION
MAY 10, 2012
Identifying and Prioritizing Geographic Areas
for Renewable Development in California**

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NRDC is a national, non-profit organization of scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than one million members, supporters and environmental activists with offices in New York, Washington, Los Angeles, San Francisco, Chicago and Beijing. NRDC has a long history of efforts to protect and conserve the nation's natural resources, including in particular the nation's air, water, lands and resources. NRDC has a distinguished record of advocacy promoting the increased use of energy efficiency and renewable energy sources to meet America's energy needs both at the national level and in various states, including California.

To inform this workshop we were asked to respond to several questions.

1. Preferred characteristics of priority areas have been identified in various forums and can be generally categorized into three distinct categories: 1) preferred sites for interconnection, 2) preferred sites for permitting, and 3) preferred sites for economic development. From your perspective, what are the specific preferred site characteristics for the three categories and which are the highest priority? Are the three categories mutually exclusive?

a. Characteristics:

NRDC strongly supports identification of low-conflict areas for priority development of renewable resources and facilitate priority transmission projects. Along with a number of partner environmental organizations, we developed a list of criteria to define high and lower risk areas for development on public land (attached) in the desert. Most of these apply on non-desert lands as well


We worked to support the RETI process to that end have been closely engaged with Bureau of Land Management to get out a meaningful, zone-based Federal Programmatic Environmental Impact Statement for Solar development on public land in the desert southwest. We are working within the DRECP process to the same end.

We are also encouraged by the Governor's interest in increasing distributed renewable generation since smaller projects are often easier to sight with low environmental conflict and can connect closer to load centers. Transmission improvements for large scale projects in appropriate zones also benefit distributed wholesale projects as well..

In our comments today- we focus on what we see as an under-valued opportunity for low-conflict renewable development, permitting, interconnection and also would provide significant economic development opportunity: namely, drainage and physically impaired or chemically altered former agricultural lands in the Central Valley.

- i. Lands that are drainage and psychically impaired, or chemically altered. *More than 90,000 acres of land in the Central Valley's Westlands Water District are planned to be retired and potentially converted to other uses due to legal settlements, chemical contamination and the reduced availability of irrigation water. As many as 200,000 acres could eventually wind up being retired. The state Department of Conservation and the National Resource Conservation Service have both indicated that potential may exist for beneficial retirements on many more acres (see attached map). Such lands have few environmental conflicts and projects located on them would be subject to accelerated permitting without cutting corners on statutorily required environmental review.*
- ii. Lands that fit the above description and/or are close to existing transmission infrastructure (including energy storage) and roads, and which, depending on the project's scale can interconnect to either the distribution or bulk electricity grids. *This helps the state meet both distributed and large scale renewable energy goals. In particular, portions of existing infrastructure that have a high value for renewable integration and system balancing, such as the helms Pumped Storage facility, may be more efficiently used, reducing consumer costs*
- iii. Lands with excellent resource quality for photovoltaic power production, which opens a greater area beyond just desert sites. *This serves three purposes: it reduces integration costs for renewable energy due to enhanced geographic diversity of solar and wind resources from other parts of the state; it enhances the reliable performance of renewables on the grid by enabling grid operators to match generation profiles between renewable energy types such as wind and solar, reducing reserve needs and balancing services; and it targets transmission upgrades to locations that increase reliability, avoid future congestion and facilitates regional energy markets. Focusing on such lands, principally in the Central Valley, will increase the priority of transmission development in this key area of the state and enhance other state and local policy and economic goals and needs such as expanding business and employment opportunities.*
- iv. Lands for which, if transmission was made available, considerable commercial interest exists or would exist. *Developers representing between three and six GW of energy capacity have expressed interest in building projects in the Central Valley. This is approximately an order of magnitude above the existing transmission system's available transfer capacity. New transmission is clearly needed to facilitate this development. But under present planning efforts led by the CPUC and CAISO does not prioritize Central Valley transmission. The reason? Ostensibly it is lack of commercial interest. Investors interested in prime development areas meeting the above criteria may not be willing to develop projects where transmission is not at least planned and for which they may not be*

able to get power purchase agreements. So we have a classic chicken and egg situation. State policy guiding transmission to areas that meet multiple state goals can break this cycle.

- v. *Lands for which, if development would be facilitated could reduce unemployment and increase economic activity in multiple sectors. Large scale generation projects located near pools of displaced workers have great potential economic benefits. Not only can they create many jobs in construction phases and more moderate numbers of jobs during O&M, they also have the potential to expand employment in support sectors and to attract new employment in equipment assembly and manufacturing. Unemployment in many Valley counties far exceeds state and national averages. According to the State Employment Development Department, unemployment in Stanislaus (17.4%) and San Joaquin Counties (16.7%) for March 2012 both hovered near 17%.*
 - b. *Are the three preferred site priorities mutually exclusive? NRDC believes the priorities not only are not mutually exclusive, in fact they are mutually supportive and can be planned for. Energy, environmental, transmission, economic development and human service priorities are never considered as a bundle. Understandably highly technical analyses for generation and transmission do not include other considerations. Moreover the grid is controlled by five different entities in the state, further limiting the consideration of broader system benefits. By prioritizing development into resource zones with few environmental impacts, closer to load in and in areas where transmission upgrades serve greater overall system benefits, we can accelerate the development of projects by reducing permit challenges, and accommodate other state policy goals and environmental needs related to agricultural land retirements. We can rationalize the transmission needed to serve those zones and plan for better system operation and performance. In other regions of the country such as the Midwest Independent System Operator's service territory an approach to identify transmission providing multiple benefits has been instituted. This process, identifying so-called multi-value projects (MVPs) has found robust benefits exist from these projects, extending across their entire 11 state region¹*
2. What data sets, information, and resources currently exist that could be useful in identifying geographic areas with preferred site characteristics? What additional data sets, information, and resources will be needed? *"A Preliminary Assessment of Salt Impaired Lands in California," NRCS. California Department of Conservation agricultural land mapping datasets; CEC RETI mapping layers; "Map of Principal Transmission Lines," Western Electricity Coordinating Council; CAISO Central Valley Study; Resource Quality mapping, NREL; Western Wind and Solar Integration Study, NREL; [How Do High Levels of Wind and Solar Impact the Grid? The Western Wind and Solar Integration Study](#) ." (December 2010). Lew, D.; Piwko, D.; Miller, N.; Jordan, G.; Clark, K.; Freeman, L.; "Survey of Variable Generation Forecasting in the West," K. Porter and J. Rogers, Exeter and Associates, NREL 2012; "Maximizing and Optimizing Renewable Power", Northrop-Grumman MORE Power, Presentation to Wyoming Infrastructure Authority, May, 2011, Dr. Randall J. Alliss; USEPA/NREL, "Repowering America's Land", dataset and mapping of brownfield sites with renewable energy development potential in all 50 states; "Beyond Capacity Markets –*

¹ *Multi Value Project Portfolio, Results and Analysis, MISO, January 2012*

Delivering Capability Resources to Europe's Decarbonised Power System, M. Gottstein and A. Skillings, Regulatory Assistance Project, 2012; "Grid Evolution: How Electric System Operation Can Welcome New Resources, Improve Reliability and Reduce Costs," David Olsen and Ronald Lehr, Western Grid Group, 2012

3. Transparent, publicly available data are needed for state and local governments, utilities, and other stakeholders to make informed, integrated energy planning decisions about priority areas. What are the barriers to making needed data sets more transparent and publicly available? *As NRDC has previously testified, transmission planning is a balkanized process involving several different sets of players. Information about the entire system and its operation and function is not aggregated in a single place. IOUs and POU's and not regulated in the same processes and have their own planning exercises. Information on the ability to share and mutually support transmission infrastructure is not coordinated well. Information on disturbed lands suitable for renewable energy development in the state is not complete and mapping is not prioritized. Outside of the desert no information or policy exists for the identification, development of and transmission to new renewable energy zones on retiring agricultural lands. No adequate overall assessment of the benefit of in-state geographical diversity or grid optimization has yet been done, across the entire system, publicly and privately owned. At the county level, few counties have general plan energy elements indicating development areas or zones they prioritize for renewable energy development.*
4. How can more transparent publicly available data be used in the future to better inform an integrated energy planning process? *Data on environmental and habitat sensitivity, land use trends, unemployment rates, grid performance and optimization, and water use and conservation legal settlements and trends should be centrally aggregated and reviewed to match state goals across policy areas to identify broad sets of benefits around which to prioritize renewable energy development areas and related infrastructure investment such as transmission. These benefits include but are not limited to: lowering consumer electricity costs, meeting carbon reduction and climate adaptation goals, improving air quality, reducing reserves needed for grid stability and ancillary services, job creation in economically challenged parts of the state, and relieving development pressures on more sensitive areas. Finally, information about how infrastructure upgrades that benefit new development zones can simultaneously assist with distributed generation penetration at the wholesale distributed scale should also be accumulated, made available and incorporated into planning and development area identification.*

We thank the Commission for the opportunity to comment on this subject and strongly support siting renewable energy development on and related transmission on the most suitable sites we can to meet California's multiple climate policy, environmental and economic development goals.



Comments of NRDC and CEERT

Subject: Central California Study of 2012-2013 Transmission Study Plan

Submitted by	Company	Date Submitted
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NRDC is a national, non-profit organization of scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than one million members, supporters and environmental activists with offices in New York, Washington, Los Angeles, San Francisco, Chicago and Beijing.

NRDC has a long history of advocacy promoting the increased use of energy efficiency and renewable energy sources to meet America's energy needs both at the national level and in various states, including California.

CEERT represents renewable energy developers and major environmental organizations and advocates for effective renewable energy and energy efficiency policies within California, the West and at the national level.

Study Objective

The assessment will monitor the transmission system in the area under a variety of scenarios and the studies will include, but not limited to the following:

- North of Los Banos north-to-south transfer capability
- Path 15 south-to-north transfer capability
- Path 26 transfer capability
- Fresno area import/export capability
- San Joaquin area transmission reinforcement requirements,
- Fresno area local capacity requirements, and
- Economic analysis for congestion relief and renewable integration
- Operational flexibility and potential economic benefit of Helms (pump and generation)

General comment:

We commend the CAISO for moving to address deficiencies in the CPUC portfolio-driven transmission planning effort by conducting a Central Valley Study. We believe the portfolios upon which the entire transmission plan is built underemphasize the true potential of Central Valley renewable generation and inadequately account for system benefits transmission in the Central Valley would provide.

Unfortunately this misperception was carried further in the assumptions presented at the stakeholder meeting on the Central Valley Plan. Conducting this study only using CPUC portfolios will result in underestimating or missing altogether many of the benefits the study is intended to identify and incorporate in planning. These include economic, reliability, operational flexibility, renewable integration, carbon reduction, land use and access to energy storage benefits. Therefore we are recommending the study take a “portfolio plus” approach in which a more reasonable scale of development is assumed, and system benefits realized are proportionate to that level of development are identified.

We believe there are also significant state and federal policy requirements, goals and objectives that could be achieved by expanding transmission capacity in the Central Valley, including: guiding both generation and transmission development to drainage and physically impaired farmland and directing economic development activities to economically stricken parts of the state hard-hit by the current recession. CAISO’s move toward recognizing policy requirements in transmission planning is a welcome improvement. We further recommend accomplishing this by utilizing a multi-value approach such as that employed by the Midwest ISO MISO. MISO describes these multi-value projects (MVPs) as: *“MVPs are one or more network upgrades that, when considered as part of a portfolio which provides widespread regional benefits, respond to documented public policy requirements and/or provide multiple*

benefits such as reliability and economic value.”¹ (See figures 2 and 3, below for more on MISO cost-benefit and tariff language)

Specific criticisms and comments:

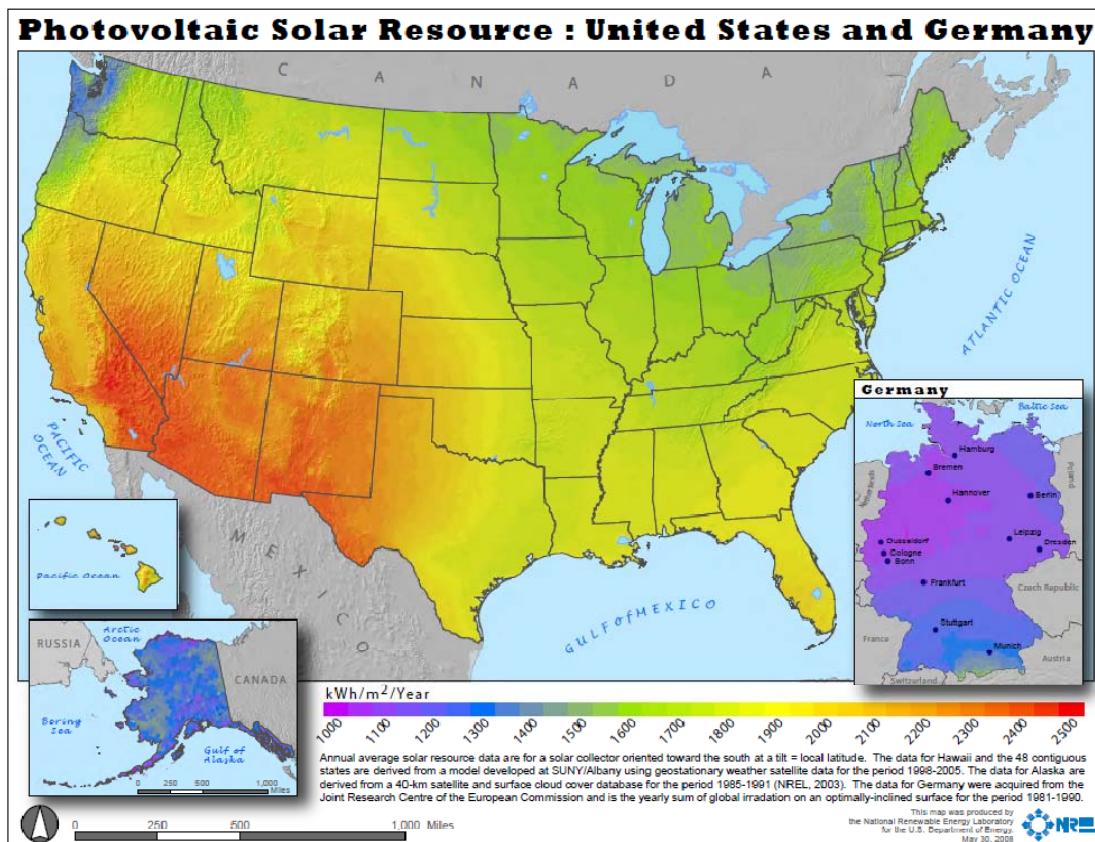
1. Portfolios are flawed – We believe there are fundamental flaws in portfolios assuming that only 70 MW of generation can be expected from the Central Valley (in all four study cases). In the proposed Westlands CREZ alone commercial interest, as evidenced by interconnection requests and offers to utilities was over 1 GW in the 2011 IOU RFO's with a build out capacity on approximately 33,000 acres on drainage impaired farmland scheduled for retirement of an estimated 3-5 GW. The existing portfolios rely on estimates of generation under RPS contract with utilities. But without transmission upgrades, Central Valley generation may never be offered for contract. Thus a “chicken and egg” situation exists that prevents development of one of the most promising RETI zones, and other similarly situated project areas in the Central Valley: no transmission, little generation investment; little generation investment, no transmission.
2. Benefits unrecognized or undervalued:
 - a. One of the system benefits unrecognized by the portfolios is that new transmission in the Valley, properly located in existing corridors, disturbed lands or on retiring agricultural land, provides a well-timed hedge against congestion. There is an estimated 600 – 1000 MW of existing system capacity in the Central Valley. This is likely to be quickly overwhelmed by planned generation of all scales. As the economy recovers there will be a considerable need for new transmission capacity in this part of California. Given the lead time for transmission development, planning for, approving and scaling correctly new upgrades should be a high priority, not just for new renewable capacity, but for reliability and congestion avoidance.
 - b. Another unrecognized benefit of Central Valley transmission expansion is that new transmission would strengthen backbone needed for balancing energy both intrastate and import-export opportunities interstate. The latter consideration is especially relevant in light of FERC Order 1000 compliance which California will be engaged in. Both public and private utilities will be engaging in regional and *inter-regional* planning under Order 1000. This will create opportunities for California to share balancing resources and reserves with neighboring states, as well as to participate more fully in regional market opportunities.
 - c. Opening Central Valley disturbed lands to generation has the further benefit of adding needed geographic diversity to the state's generation mix, aiding grid integration and operation and reducing costs. Improved forecasting techniques combined with a mix of generation technologies spread geographically can provide uncorrelated variability to the system, reducing balancing and reserve needs. Increased diversity is possible and

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M. Rauch, Presentation to MISO, Technical Studies Task Force, February Meeting on 2011 Candidate MVP Portfolio

desirable in California, where much of the renewable fleet is clustered in the East Mojave.

- d. One of the most important benefits of enhanced transmission capacity in the Central Valley is increased potential to utilize the Helms pumped storage facility for regulation and balancing services. We are gratified that this will be a key element of the proposed study, but are concerned that the analysis may be skewed (and benefits under represented) by portfolio assumptions that suggest an unrealistically low amount of energy expected from Central Valley renewable resources.
- e. Non-electric benefits also come into play. Hundreds of thousands of acres of Westlands Water District lands must be retired which have strong solar generation potential. Though solar radiation in the Central Valley is not equivalent to the Direct Normal Insolation (DNI) recorded at desert locations, horizontal radiation in the Central Valley combined with excellent DNI make the Valley one of the finest photovoltaic energy zones in the world. As the map below indicates, Valley photovoltaic radiation far surpasses that of Germany, a world leader in photovoltaic installations. The worst California resource is better than the finest German resource, which is roughly comparable to Alaska's solar resource. Access to this world-class solar resource means that retiring contaminated agricultural lands from production enables California to transition these lands to a better, higher purpose, namely renewable energy production.



- f. As mentioned above an enormous amount of agricultural lands are in the process of being retired from production in the Central Valley. This region has been characterized as the Appalachia of the West in terms of its economic suffering and under-employment. *Unemployment in many Valley counties far exceeds state and national averages. According to the State Employment Development Department, unemployment in Stanislaus (17.4%) and San Joaquin Counties (16.7%) for March 2012 hovered near 17%. As previously famed lands come out of production, unemployment in the Central Valley has hit astronomical levels, creating an economic drain on the entire state. Relieving this distress is a high state priority. Because of the enormous potential for large scale generation to create both construction and O&M jobs, energy development (and enabling transmission) should be prioritized. We realize this type of factor is not usually a part of CAISO or CPUC analyses and we are gratified to see economic considerations added to the list of issues in the proposed Central Valley study. Looking beyond simply avoided congestion costs should be a part of this work.*
 - g. One important additional consideration has to do with leveraging federal resources for transmission investments. The Western Area Power Administration (Western) has considerable ability to fund transmission development under federal law (ARRA). This authority favors renewable energy development and could be utilized to augment other funds to build transmission. Moreover, Western owns transmission infrastructure in the Central Valley that could become part of a more integrated and operationally better coordinated transmission system. Recent direction to the Power Marketing Authorities by Secretary Chu emphasized regional transmission coordination. The best if not only opportunity to avail state consumers of these financial and operational co-benefits with Western exists in the Central Valley. Thus both financial and operational benefits could be realized if Central Valley transmission was prioritized by CAISO.
- 3. Conclusion: We believe that a “Portfolio Plus” approach is needed to cover reasonably expected futures. By “Portfolio Plus” we mean considering factors – especially other state goals and priorities – beyond those included in the portfolios provided by the CPUC to prioritize transmission development in California. This approach – similar to one used by MISO’s MVP portfolio – has demonstrated that real benefits can be expected for electricity customers system-wide (see figure 2). We are not suggesting CAISO ignore CPUC portfolios and applaud the efforts at enhanced coordination between the two entities. But looking beyond the portfolios provided by the CPUC will provide the best value to California energy consumers and customers. Nothing prevents CAISO from doing this. On the contrary, as evidenced by FERC Order 1000, and MISO’s approach with MVPs, considering policy goals of states is becoming an expectation for both regional and inter-regional transmission planning, cost allocation and development.

NRDC and CEERT thank you for this opportunity to comment on the proposed Central Valley Study.

Figure 2: MISO Portfolio benefits spread

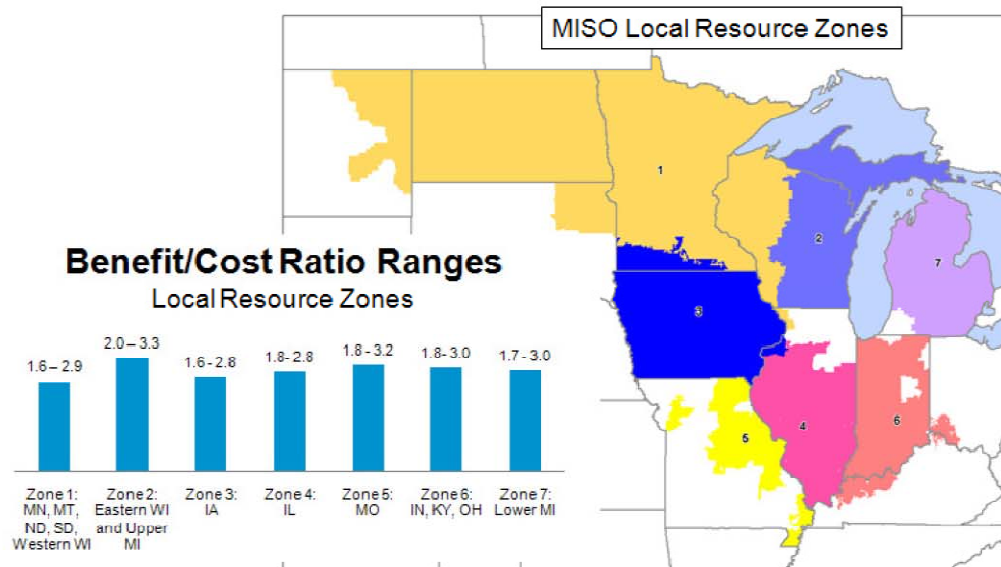


Figure 1.5: Recommended MVP portfolio benefits spread

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Figure 3: MISO MVP Tariff Criteria ³

Criterion 1

A Multi Value Project must be developed through the transmission expansion planning process to enable the transmission system to deliver energy reliably and economically in support of documented energy policy mandates or laws enacted or adopted through state or federal legislation or regulatory requirement. These laws must directly or indirectly govern the minimum or maximum amount of energy that can be generated. The MVP must be shown to enable the transmission system to deliver such energy in a manner that is more reliable and/or more economic than it otherwise would be without the transmission upgrade.

Criterion 2

A Multi Value Project must provide multiple types of economic value across multiple pricing zones with a Total MVP benefit to cost ratio of 1.0 or higher, where the total MVP benefit to cost ratio is described in Section II.C.7 of Attachment FF to the MISO Tariff. The reduction of production costs and the associated reduction of LMPs from a transmission congestion relief project are not additive and are considered a single type of economic value.

Criterion 3

A Multi Value Project must address at least one transmission issue associated with a projected violation of a NERC or Regional Entity standard and at least one economic based transmission issue that provides economic value across multiple pricing zones. The project must generate total financially quantifiable benefits, including quantifiable reliability benefits, in excess of the total project costs based on the definition of financial benefits and Project Costs provided in Section II.C.7 of Attachment FF.

² "Multi-Value Project Portfolio, Results and Analysis," MISO, Multi Value Project Report, January 2012

³ *Ibid.*

Audubon California
California Native Plant Society * California Wilderness Coalition
Center for Biological Diversity * Defenders of Wildlife
Desert Protective Council * Mojave Desert Land Trust
National Parks Conservation Association
Natural Resources Defense Council * Sierra Club * The Nature Conservancy
The Wilderness Society * The Wildlands Conservancy

Renewable Siting Criteria for California Desert Conservation Area

Environmental stakeholders have been asked by land management agencies, elected officials, other decision-makers, and renewable energy proponents to provide criteria for use in identifying potential renewable energy sites in the California Desert Conservation Area (CDCA). Large parts of the California desert ecosystem have survived despite pressures from mining, grazing, ORV, real estate development and military uses over the last century. Now, utility scale renewable energy development presents the challenge of new land consumptive activities on a potentially unprecedented scale. Without careful planning, the surviving desert ecosystems may be further fragmented, degraded and lost.

The criteria below primarily address the siting of solar energy projects and would need to be further refined to address factors that are specific to the siting of wind and geothermal facilities. While the criteria listed below are not ranked, they are intended to inform planning processes and were designed to provide ecosystem level protection to the CDCA (including public, private and military lands) by giving preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores. They were developed with input from field scientists, land managers, and conservation professionals and fall into two categories: 1) areas to prioritize for siting and 2) high conflict areas. The criteria are intended to guide solar development to areas with comparatively low potential for conflict and controversy in an effort to help California meet its ambitious renewable energy goals in a timely manner.

Areas to Prioritize for Siting

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
 - Lands that have been “type-converted” from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).¹
- Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of the CDCA:²
 - Allow for the expansion of renewable energy development onto private lands.
 - Private lands development offers tax benefits to local government.
- Brownfields:
 - Revitalize idle or underutilized industrialized sites.
 - Existing transmission capacity and infrastructure are typically in place.

- Locations adjacent to urbanized areas:³
 - Provide jobs for local residents often in underserved communities;
 - Minimize growth-inducing impacts;
 - Provide homes and services for the workforce that will be required at new energy facilities;
 - Minimize workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally designated corridors with existing major transmission lines.⁴

High Conflict Areas

In an effort to flag areas that will generate significant controversy the environmental community has developed the following list of criteria for areas to avoid in siting renewable projects. These criteria are fairly broad. They are intended to minimize resource conflicts and thereby help California meet its ambitious renewable goals. The criteria are not intended to serve as a substitute for project specific review. They do not include the categories of lands within the California desert that are off limits to all development by statute or policy.⁵

- Locations that support sensitive biological resources, including: federally designated and proposed critical habitat; significant⁶ populations of federal or state threatened and endangered species,⁷ significant populations of sensitive, rare and special status species,⁸ and rare or unique plant communities.⁹
- Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, proposed HCP and NCCP Conservation Reserves.¹⁰
- Lands purchased for conservation including those conveyed to the BLM.¹¹
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes.¹²
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas.¹³
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands.¹⁴
- National Historic Register eligible sites and other known cultural resources.
- Locations directly adjacent to National or State Park units.¹⁵

EXPLANATIONS

¹ Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

² Based on currently available data.

³ Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for their economic survival.

⁴ The term "federally designated corridors" does not include contingent corridors.

⁵ Lands where development is prohibited by statute or policy include but are not limited to:

National Park Service units; designated Wilderness Areas; Wilderness Study Areas; BLM National Conservation Areas; National Recreation Areas; National Monuments; private preserves and reserves; Inventoried Roadless Areas on USFS lands; National Historic and National Scenic Trails; National Wild, Scenic and Recreational Rivers; HCP and NCCP lands precluded from development; conservation mitigation banks under conservation easements approved by the state Department of Fish and Game, U.S. Fish and Wildlife Service or Army Corps of Engineers a; California State Wetlands; California State Parks; Department of Fish and Game Wildlife Areas and Ecological Reserves; National Historic Register sites.

⁶ Determining “significance” requires consideration of factors that include population size and characteristics, linkage, and feasibility of mitigation.

⁷ Some listed species have no designated critical habitat or occupy habitat outside of designated critical habitat. Locations with significant occurrences of federal or state threatened and endangered species should be avoided even if these locations are outside of designated critical habitat or conservation areas in order to minimize take and provide connectivity between critical habitat units.

⁸ Significant populations/occurrences of sensitive, rare and special status species including CNPS list 1B and list 2 plants, and federal or state agency species of concern.

⁹ Rare plant communities/assemblages include those defined by the California Native Plant Society’s Rare Plant Communities Initiative and by federal, state and county agencies.

¹⁰ ACECs include Desert Tortoise Desert Wildlife Management Areas (DWMAs). The CDCA Plan has designated specific Wildlife Habitat Management Areas (HMA) to conserve habitat for species such as the Mohave ground squirrel and bighorn sheep. Some of these designated areas are subject to development caps which apply to renewable energy projects (as well as other activities).

¹¹ These lands include compensation lands purchased for mitigation by other parties and transferred to the BLM and compensation lands purchased directly by the BLM.

¹² Landscape-level linkages provide connectivity between species populations, wildlife movement corridors, ecological process corridors (e.g., sand movement corridors), and climate change adaptation corridors. They also provide connections between protected ecological reserves such as National Park units and Wilderness Areas. The long-term viability of existing populations within such reserves may be dependent upon habitat, populations or processes that extend outside of their boundaries. While it is possible to describe current wildlife movement corridors, the problem of forecasting the future locations of such corridors is confounded by the lack of certainty inherent in global climate change. Hence the need to maintain broad, landscape-level connections. To maintain ecological functions and natural history values inherent in parks, wilderness and other biological reserves, trans-boundary ecological processes must be identified and protected. Specific and cumulative impacts that may threaten vital corridors and trans-boundary processes should be avoided.

¹³ Proposed Wilderness Areas: lands proposed by a member of Congress to be set aside to preserve wilderness values. The proposal must be: 1) introduced as legislation, or 2) announced by a member of Congress with publicly available maps. Proposed National Monuments: areas proposed by the President or a member of Congress to protect objects of historic or scientific interest. The proposal must be: 1) introduced as legislation or 2) announced by a member of Congress with publicly available maps. Citizens’ Wilderness Inventory Areas: lands that have been inventoried by citizens groups, conservationists, and agencies and found to have defined “wilderness characteristics.” The proposal has been publicly announced.

¹⁴ The extent of upland habitat that needs to be protected is sensitive to site-specific resources. For example: the NECO Amendment to the CDCA Plan protects streams within a 5-mile radius of Townsend big-eared bat maternity roosts; aquatic and riparian species may be highly sensitive to changes in groundwater levels.

¹⁵ Adjacent: lying contiguous, adjoining or within 2 miles of park or state boundaries. (Note: lands more than 2 miles from a park boundary should be evaluated for importance from a landscape-level linkage perspective, as further defined in footnote 12).