

Renewable Energy

Helping to Energize California

California 2010

Bureau of Land Management



Energizing California

"More energy will be needed to drive [California's] economic engines...public lands will continue to play a critical role."

California is at the forefront of this country's hopes for renewable energy. The State's wind, solar, geothermal and biomass resources, many on public lands managed by the Bureau of Land Management (BLM), hold tremendous promise for a secure and reliable energy future.

More energy will be needed to drive the economic engines of the eight largest economy in the world. The public lands administered by the BLM will continue to play a critical role.

California's energy is generated from a variety of sources. According to the U.S. Department of Energy, natural gas is the largest source (47%), followed by nuclear (16%), coal (15%, mostly from out of state generation), renewable (13% including geothermal, biomass, small hydro, wind and solar), and hydroelectric (about 9%). Additional capacity is needed to make California more energy self-sufficient. Federal and state agencies are working together fill the majority of this need using renewable sources of energy.

Both President Barack Obama and Governor Arnold Schwarzenegger have set high targets for renewable production. The President calls for doubling renewable energy production in three years. The Governor has set a 33% target for California's utilities to generate electricity from renewable sources by 2020.

Secretary of the Interior Ken Salazar signed an order in March 2009 making renewable energy production a top priority for the Department and the BLM. He also signed an order in November 2009 establishing the Renewable Energy Action Team, or REAT, comprised of BLM, California Department of Fish and Game, the California Energy Commission, and U.S. Fish and Wildlife Service.

Together, the agencies are developing a Desert Renewable Energy Conservation

Plan for California, called the DRECP. A notice of intent was published in November 2009 and a draft map identifying areas primarily for conservation and areas more suitable for development was published in March 2009.



The sun's heat is concentrated to generate solar energy



Solar plant, Department of Energy photo

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Wind Energy

California possesses significant wind resources, stretching from the Oregon border to Mexico, with the largest concentration of high wind power areas in the Southern California. California is a national leader in the production of wind energy (second to Texas), producing about 20 percent of the nation's total capacity.



California produces 43 percent of the nation's wind capacity

BLM public lands play a major role in this effort. Currently, about 3,000 wind turbines on public lands produce 234 megawatts of power and \$600,000 annually in royalties. This production comes from 24 rights-of-way on 4,060 acres, mostly in the San Geronio Pass area in Riverside County and the Tehachapi Pass area in Kern County. These figures do not include development on private lands.

Industry interest is high, mostly due to the national focus on renewable energy, as well as the State of California's Renewable Portfolio Standards described earlier. Applications for wind energy on public lands, mostly for testing at this stage, are

increasing, with most of that activity in the California Desert. This testing process, which may take 2 to 3 years, involves using anemometers to judge wind strength and sustainability, and to evaluate various potential development options.

Fast Tracks

Currently, BLM-California is processing three "fast track" wind development project applications, involving about 19,000 acres of BLM-managed public lands. "Fast track" means these projects are on target with their environmental reviews and other requirements to reach a decision stage by the end of 2010.

The three proposals - - Daggett Ridge (San Bernardino County), Granite Mountain (San Bernardino County), and Tule Wind (San Diego County), would, if approved, generate an estimated 355 megawatts of renewable energy.



Wind and other renewable projects need roads and power lines to reach Californians

"Applications for wind energy on public lands, mostly for testing at this stage, are increasing ..."

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"The California Desert region holds some of the highest concentrations of solar energy in the United States."

Solar

California is generously endowed with sunshine – a naturally occurring energy source holding tremendous promise for helping meet the State's growing energy needs. The California Desert region holds some of the highest concentrations of solar energy in the United States.

California is a pioneer in this area, with its California Solar Initiative to provide incentives for small-scale solar development.

On BLM public lands, solar development for large-scale electricity projects is just beginning, but the future looks bright.

Solar companies are proposing to use a variety of solar technologies. These can be generally described as follows:

- Photovoltaic technology uses solar cells packaged together in large, mirror-like arrays to convert sunlight directly into electricity.
- Parabolic trough technology uses rows of parabolic mirrors with an absorber tube to concentrate energy into a thermal power plant.
- Solar dish technology uses dish-shaped mirrors to heat a piston engine and does not require a thermal plant.



Remote Dish-Stirling system technology is used to capture solar energy

- Power tower technology uses a central tower (300-450 feet in height) with a field of mirrors to concentrate energy into a thermal power plant.

The Secretary of the Interior has identified proposed Solar Energy Study Areas throughout the west to be analyzed in the Programmatic Solar Energy Environmental Impact Statement now underway by the Department of Energy and BLM.

Twenty-four tracts of BLM managed land are under review. A draft document will be published for public review.

Fast Tracks

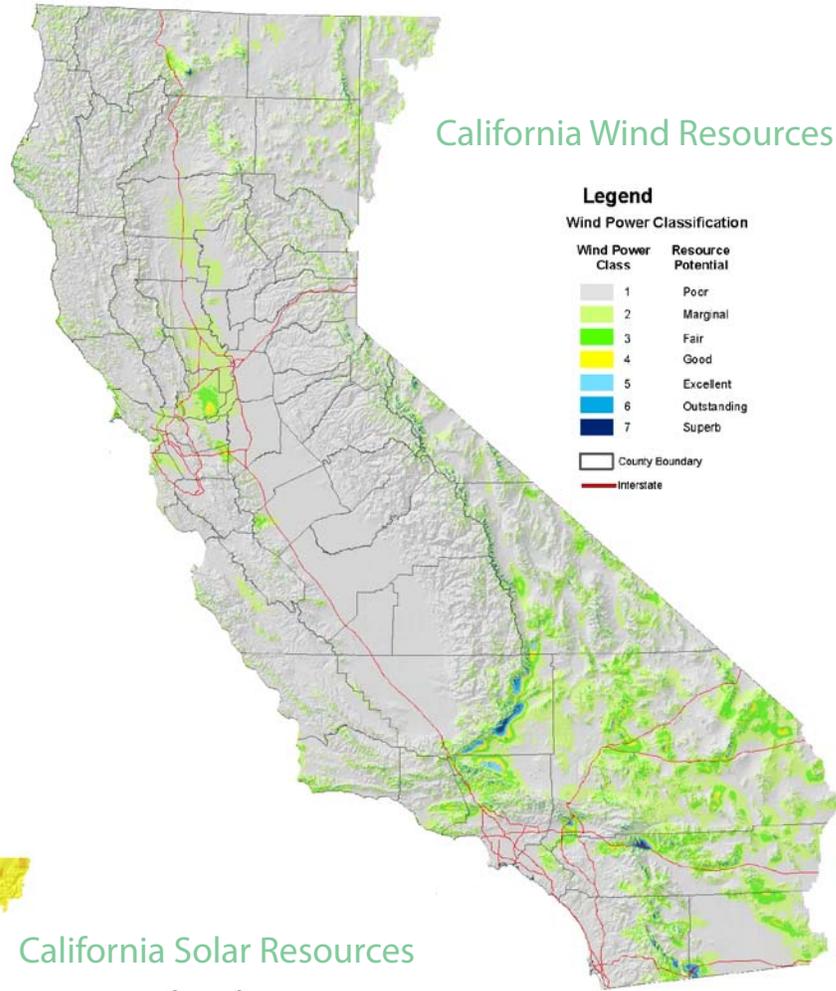
Currently, BLM-California is processing nine "fast track" solar development project applications, involving about 42,000 acres of BLM-managed public lands. "Fast Track" means these projects are on target with their environmental reviews and other requirements to reach a decision stage by the end of 2010.

The nine proposals - - Ivanpah Brightsource (San Bernardino County), Solar Millennium Blythe (Riverside County), Solar Millennium Palen (Riverside County), Solar Millennium Ridgecrest (Kern County), Nextera Genesis Ford Dry Lake (Riverside County), Stirling Energy Systems Solar One ((Imperial County), Stirling Energy Systems Solar Two (San Bernardino County), First Solar Desert Sunlight (Riverside County), and Chevron Energy Systems Lucerne Valley (San Bernardino County) - - would, if approved, generate an estimated 4,600 megawatts of renewable energy.

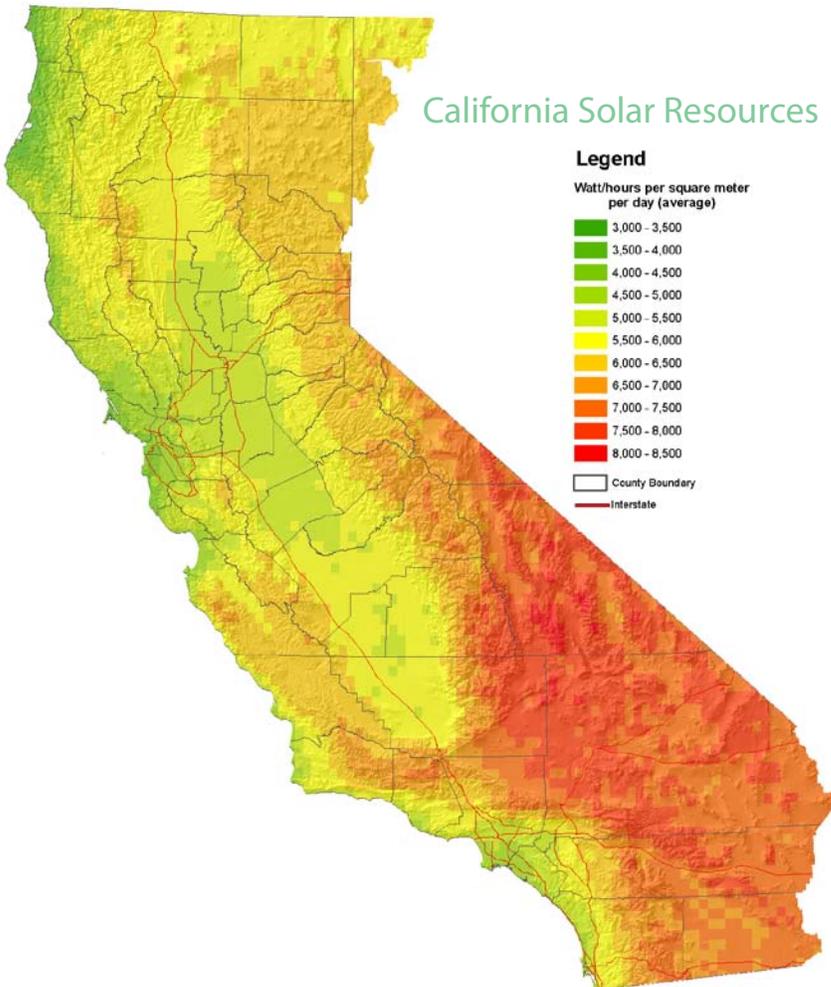
In addition, a longer term look at solar energy development is being done by the Department of Energy in the Solar Programmatic Environmental Impact Statement being prepared with Interior.

Where are the Resources?

California Wind Resources



California Solar Resources



"Demands in California are generating new interest in renewable energy."

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Geothermal

"Together, federal geothermal resources support a generation capacity of over 500 megawatts of electricity."

In regard to geothermal energy, California is "steaming hot"! This energy source, which literally means "earth's heat", is found throughout California on public lands. Currently, 32 federal geothermal leases in six geothermal fields supply 12 powerplants on federal leases, and in part, supply resources to another 19 powerplants located on private lands. Together, federal geothermal resources support a generation capacity of over 500 megawatts of electricity. That's enough energy for over 500,000 people, and replaces the need for two million barrels of oil each year.

Royalties totalled almost \$9 million (\$8.8 million) in 2009, with almost \$7 million (\$6.6 million) going to the State and county where the energy was generated. Two competitive lease sales over the past two years drew over \$8 million in bonus bids, with one bid the highest per acre (\$14,000) ever paid at a geothermal sale.

The six fields with federal geothermal leases include The Geysers in Lake and Sonoma counties (the largest geothermal field in the world!), Coso Hot Springs in Inyo County, East

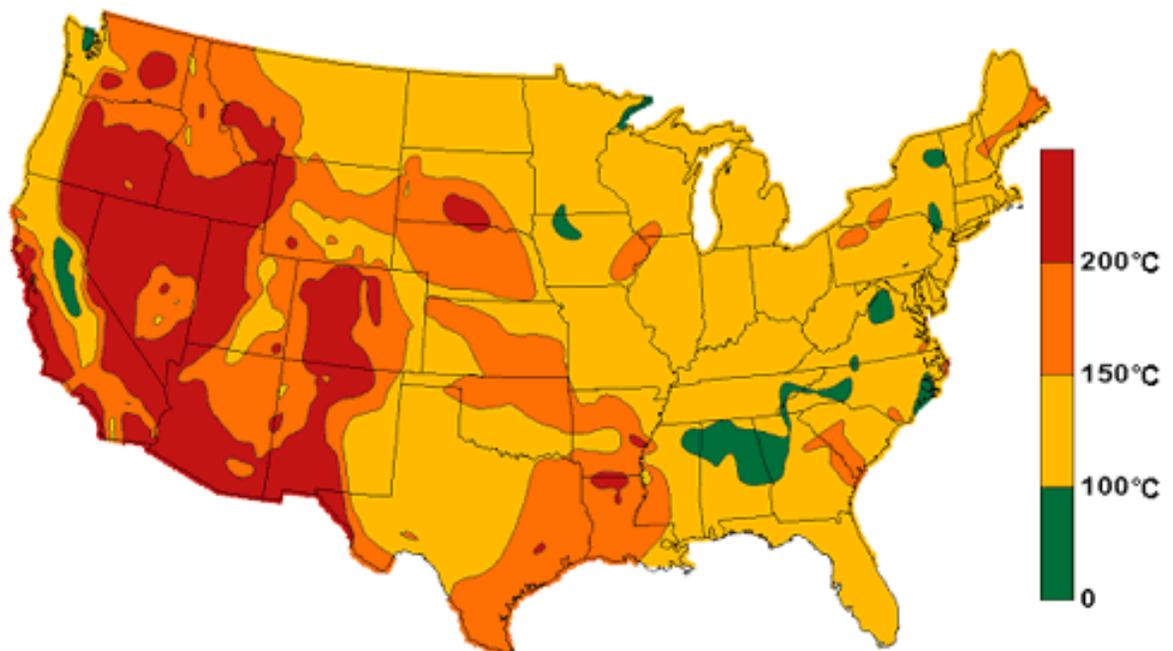
Mesa and Heber in Imperial County, Casa Diablo in Mono County, and Wendel-Amedee in Lassen County.

New exploration proposals are under review, which may lead to new development projects.

BLM completed the Truckhaven Geothermal Leasing Area Environmental Impact Statement (EIS) and used this document in 2009 to issue 5 pending lease applications and another 12 competitive leases, all totalling over 16,000 acres in the Imperial Valley. BLM is preparing two new EIS's to consider geothermal leasing on over 19,000 acres in the West Chocolate Mountains Geothermal area, also in the Imperial Valley, and over 22,400 acres in the Haiwee Geothermal area near Coso Hot Springs in Inyo County.



A geothermal power plant in northern California



Transmission and Renewable Energy Zones

Along with the tremendous promise, developing renewable energy presents two major challenges: siting these power facilities while protecting sensitive lands and resources, and connecting this new power to the transmission system, or "grid," to bring it into Californians'



Getting power from generating facilities to the public is a challenge

homes and businesses.

The BLM, the State of California, the Western Governors Association, and Congress are already working on these issues. California leads the way with its Renewable Energy Transmission Initiative (RETI). RETI, made up of agencies, stakeholders, interest groups, and companies, is identifying key linkages throughout the state to tie the existing and potential new transmission lines to the State's most promising energy sites with the least environmental impacts. The goal is to identify Competitive Renewable Energy Zones focusing on already disturbed or less sensitive lands close to existing or planned transmission systems.

Secretary Salazar's Order No. 3285, signed March 11, 2009, also calls for establishing renewable energy zones and transmission infrastructure to facilitate renewable energy development.

Fast Tracks

Currently, BLM-California is processing three "fast track" transmission development project applications, stretching about 145 miles across BLM-managed public lands and other ownerships. "Fast Track" means these projects are on target with their environmental reviews and other requirements to reach a decision stage by the end of 2010.

The three proposals - - Barren Ridge (Kern and Los Angeles counties), Dever-Palo Verde (San Bernardino and Riverside counties), and Eldorado-Ivanpah (San Bernardino County) - - would, if approved, add about 145 miles of transmission capacity to carry renewable energy across the Desert.

In addition, the Sunrise Powerlink, proposed by San Diego Gas and Electric to transmit renewable and non-renewable energy, has already been approved, while the Green Path North transmission line, proposed by Los Angeles Department of Water and Power, has been withdrawn.



Wind turbine in the Palm Springs area

"The goal is to identify Competitive Renewable Energy Zones focusing on already disturbed or less sensitive lands close to existing or planned transmission systems."

Renewable Energy

Biomass

Biomass is “biologically–derived renewable material” used to produce energy. California is also a leader in this emerging source of fuel. The State has set ambitious goals in its 2006 “Bioenergy Action Plan” seeking to significantly expand current production (about 2% of the State’s needs) by 2020.

BLM lands hold tremendous potential for this use. Currently, public lands produce 30,000 tons of biomass. Opportunities are being identified throughout the State.

BLM is currently cooperating with Modoc County and other partners on a biomass study area involving 6.6 million acres of juniper stands in northeastern California and northwestern Nevada. Juniper, an invasive species which encroaches on native sage-steppe vegetation, has the potential to produce 4 million tons of biomass. As an additional benefit, thinning juniper will reduce wildland fire fuels, benefit rangeland health, and restore sage grouse and mule deer habitat.



Juniper trees are sent through a chipper before transport to a biomass facility

“Currently public lands produce 30,000 tons of biomass.”

Renewable Energy Summary (as of March 2010)				
Area	Wind			Solar
	Applications Testing	Authorizations for Testing*	Applications for Development**	Applications for Development
Statewide Acres	71 733,097	26 137,410	19 143,267	53 444,628
Desert Acres	51 532,429	19 68,515	13 67,830	0
Central CA Acres	5 27,354	1 0	1 8,157	0
Northern CA Acres	15 173,314	5 68,895	5 67,280	0

* Authorized testing acreages exclude projects submitted for development.

**BLM currently has authorized more than 3,000 wind turbines on public lands, but they are not included here for space reasons. Solar development is just undergoing environmental review and no projects have yet been approved as of this date.

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