

Appendix F

DRECP Energy Development Assumptions
and the BLM LUPA

F DRECP ENERGY DEVELOPMENT ASSUMPTIONS AND THE BLM LUPA

F.1 Introduction

This appendix briefly summarizes the renewable energy development assumptions used by the Renewable Energy Action Team (REAT) agencies (Bureau of Land Management, California Energy Commission, U.S. Fish and Wildlife Service and California Department of Fish and Wildlife) in developing the DRECP, and the role of these assumptions in the BLM Land Use Plan Amendment (LUPA) component of the DRECP.

The energy development assumptions used in developing the DRECP were necessary to provide an estimate of the number of acres that could be developed for renewable energy through the year 2040 so that the estimated acres of impact could be used as a basis for the plan's environmental analysis. These assumptions were not intended to direct how California's energy system should evolve, nor were they intended to advocate for or influence a specific set of energy policy measures. Furthermore, these energy development assumptions do not represent a recommended amount of, or target for, renewable energy development in the DRECP plan area.

Ultimately, future policy direction, market and technology developments, and other factors will determine how much renewable energy will be needed for California to meet its long term climate goals and where that development takes place. However, given current federal and state policies, there likely will continue to be market demand for solar, wind and geothermal energy development in the California desert. More detailed information about the DRECP energy planning assumptions can be found in Section I.3.5 and Appendix F of the Draft DRECP.

F.2 DRECP 2040 Energy Planning Assumptions

The energy planning assumptions developed for the DRECP are based on California's goal of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050, and take into account other state and federal renewable energy goals and policies. The BLM has direction from Congress, the President, and the Secretary of the Interior to facilitate renewable energy development on public lands, from the Energy Policy Act of 2005, the President's Climate Action Plan, and Secretarial Order 3285, respectively. Federal renewable energy policies are described in more detail in Section I.1.2 and I.2.1.3 of the Final EIS.

In order to derive a reasonable estimate of how much renewable energy may be developed in the plan area by 2040, the REAT agencies drew from existing policies and made reasonable assumptions about the possible direction of future policies in the climate, transportation, and energy sectors. Assumptions regarding the central-station renewable energy generation resources that might be constructed in the DRECP plan area were based

on estimates of California's renewable energy needs in 2040. Those renewable energy needs were derived from: (1) estimates of future electricity demand through 2040, including the impact of demand reduction programs, such as energy efficiency incentives, and the impact of increasing electrification of the transportation sector; (2) assumptions about electricity supply in 2040, including limitations on the use of fossil fuel generation and the growth of distributed generation; and (3) the development of a sample portfolio to meet the estimated need for central station renewable energy, including assumptions about the extent to which projects contributing to that need may be built outside of the plan area. A brief discussion of this three-step process follows.

1. *Estimates of future electricity demand.* The Energy Commission is charged with forecasting electricity demand in California, biennially producing a ten-year forecast based on projected demographic changes, economic growth, and savings arising from energy efficiency programs and measures. This forecast is the basis of California's electricity planning and is utilized by the California Public Utilities Commission (CPUC) and California Independent System Operator (ISO) in their ten-year planning processes (CPUC's Long-term Procurement Planning proceeding and the ISO's Transmission Planning Process).

The Energy Commission compared its assumptions of electricity demand for the DRECP with its most recent ten-year electricity demand forecast (adopted by the Energy Commission in January 2015) for consistency. Extrapolation of the ten-year forecast, adjusted downward to account for the slower rate of population growth expected over 2025 – 2040, yielded 2040 estimated values comparable to those assumed for the DRECP. Numerous long-run uncertainties regarding the impact of economy-wide decarbonization on electricity demand –for example, 17 million alternative fuel (e.g., electric) vehicles are assumed to be operating in California in 2040 to meet GHG emission reduction targets – mean that the 2040 estimate is a scenario (i.e., one possible future) and not a forecast.

2. *Assumptions about electricity supply.* After the total electricity demand in 2040 was estimated, the supply of generating resources contributing to meeting that demand needed was considered. This requires an assumption regarding the cap on GHG emissions from the electricity sector (42 percent of 1990 values) and the associated natural-gas fired generation (GWh) allowed,¹ Contributions by out-of-state renewable energy projects, electricity from other zero-carbon resources (e.g., nuclear, large hydro), and the share of demand met by distributed generation (e.g.,

¹ Natural gas has the lowest GHG emissions factor (roughly 0.4 metric tons CO₂-e/MWh) of any fossil fuel used in generation; coal-fired generation was assumed not to take place

rooftop solar or non-utility scale projects) were then posited. The remaining needed electricity generation will come from in-state central-station² renewable projects.

3. *Development of a sample portfolio.* A portfolio of utility-scale solar, wind, geothermal, and biofuel plants was constructed to meet the estimated, future demand. The exact composition of the portfolio is informed by recent and near-term (10-year projected) procurement activity, technology costs, fuel constraints, and the relative cost of these technologies both in California and out-of-state, among other factors. Once the portfolio was developed, the Energy Commission used recent and planned procurement activity and industry information regarding location and performance of renewable energy resources to allocate the necessary in-state generation capacity to inside and outside of the DRECP area. Finally, the estimated acreage requirements (direct footprint, acres per MW of capacity) of each technology were used to derive total acreage requirements in the DRECP area.

As noted above, this portfolio of generation resources was used to estimate the development footprint (acreage) of renewable energy generation that may be built in the DRECP plan area. For purposes of the environmental analysis, the associated megawatts were proportionally distributed across the Development Focus Areas (DFAs) in each alternative. Additional disturbance acreage was added to account for a variety of constraints on power plant development, such as land parcelization,³ possible variations in the geographic distribution of projects across the DRECP area, and the acreage needed for electric transmission lines.

F.3 The Process for Developing Planning Assumptions for the DRECP

The Energy Commission developed a spreadsheet-based tool (the “Acreage Calculator”) to communicate the planning assumptions used for the DRECP with the public. The Acreage Calculator also allows the public to develop their own 2040 scenarios by allowing users to modify the calculator inputs with their own assumptions.

In the course of developing the DRECP, the Energy Commission presented several 2040 scenarios to stakeholders and the public for consideration. Public comments on each scenario led to revisions and a new scenario. A July 2012 scenario was used as the basis for the alternatives considered and analyzed in the Draft DRECP, also known as the “DRECP 2040 Scenario”. Public comments on the scenario resulted in the Energy Commission conducting a detailed review of each element of the Acreage Calculator,

² Central-station power plants are those that are 20 MW or larger in size, distributed generation are those facilities or systems with a generating capacity less than 20 MW. In some contexts, the size threshold may be as low as 5 MW.

³ See Section I.3.5.4.6 of the Draft DRECP and EIR/EIS, Estimating Initial Acreage Requirements for Generation in the Plan Area.

which uncovered an error in one of the formulas used to develop the July 2012 scenario. The Energy Commission simultaneously corrected the error and considered public comments made on the Draft DRECP on the energy planning assumptions in revising the scenario, available at drecp.org.

Many public comments on the energy planning assumptions presented in the Draft DRECP stressed the possibility and desirability of meeting California's 2040 GHG emission reduction targets with alternative approaches that would result in less development in the DRECP area, including one or more of the following strategies:

- Increasing expenditures on energy efficiency in order to further reduce electricity demand below that assumed in the DRECP 2040 Scenario;
- The development of renewable or other zero- or low-carbon central-station technologies outside the DRECP plan area to a greater degree than was assumed in the DRECP 2040 Scenario; and
- Increased amounts of distributed solar generation, especially rooftop solar, that markedly reduced the need for central-station resources.

The DRECP 2040 scenario is intended to provide a reasonable estimate of potential future development in the DRECP area for the purposes of scaling the environmental analysis in the DRECP. It is not in itself intended to advocate for a specific set of policy measures or to influence the future development of energy policy. Additional discussion of distributed generation and why a distributed generation-only alternative was considered but not carried forward for analysis in the DRECP can be found in Section II.8 of the Final EIS.

The DRECP 2040 scenario assumes that mature, central-station renewable generation technologies will be a primary tool in decarbonizing California's electricity sector over the next 25 years, and that the DRECP area will continue to be an important region for renewable energy development. While the level of renewable energy development in the DRECP area cannot be precisely predicted, the purpose of the DRECP is to ensure that the development that does occur is steered toward the most appropriate locations, consistent with the broader conservation framework for the California desert developed in the DRECP.

F.4 The DRECP 2040 Scenario

The Energy Commission worked to develop a set of economic, energy, and environmental projections that would allow a reasonable estimate of the amount of renewable generation capacity that might be developed within the DRECP area to provide the zero-carbon energy needed to meet GHG emission reductions targets. The revised July 2012 scenario includes 17,163 MW of renewable generating capacity that may be developed by 2040 in the Plan Area (Appendix F3 of the Draft DRECP). To account for the many uncertainties in this

projection, allow for flexibility, and ensure the DRECP can accommodate the level of renewable energy development that may be needed in the region, the REAT agencies allowed for a margin of error and planned for the development of up to 20,000 MW of new renewable electricity generation and associated transmission capacity. This process is described in more detail in Sections I.3.5.4.4 and I.3.5.4.5 of the Draft DRECP. As noted above, the DRECP 2040 scenario was adjusted slightly based on stakeholder input on the Draft DRECP and an error in previous calculations that was uncovered, but the amount of capacity developed in the DRECP area did not significantly change.

F.5 DRECP Energy Assumptions in the BLM LUPA

The assumptions summarized above were made for the entire DRECP plan area and were used as a basis for developing the public and private land Development Focus Areas (DFAs) in the Draft DRECP. The DFAs were developed in the Draft DRECP following five guiding principles, as described in Section I.3.5.3.1 of the Draft DRECP:

1. Generation should be developed either on already-disturbed land or in areas of lower biological value, and conflict with both biological and non-biological resources should be minimized.
2. Areas identified for generation should have high-quality solar, wind, and/or geothermal renewable energy resources.
3. Generation should be sited close to existing transmission and in areas where transmission could be expected as a reasonable extension of the existing transmission system and planned system upgrades, as identified by the Renewable Energy Transmission Initiative, or other transmission plans.
4. Generation should, to the maximum extent possible, be aggregated to avoid transmission sprawl, reduce cost, and reduce disturbance across the Plan Area. Again, this principle aims to minimize disturbance to biologically, culturally, recreation, and visual valuable areas. The Plan should provide sufficient areas for development flexibility to ensure the Plan does not constrain competition within the market or unnecessarily result in distorted or environmentally incompatible incentives when implemented (i.e., where feasible, the Plan should remain market neutral between different technologies or different project configurations).

Proposed DFAs were identified by using the energy assumptions and applying the guiding principles described above.

F.6 Energy Planning Assumptions on BLM Lands

With the phasing of the DRECP, the BLM LUPA is proceeding first. In the second phase, the DRECP agencies will work with counties and cities to address non-federal lands. The BLM

LUPA is still a part of the overall DRECP, and the DFAs identified in the BLM’s Proposed Plan Amendment are within the range of alternatives presented in the Draft DRECP. Thus, the assumptions made for the overall DRECP area still are applicable to the LUPA.

About 79 percent of DFAs identified in the Draft DRECP Preferred Alternative were located on private lands, in part because BLM lands tend to be less disturbed and have higher biological and other resource values. About 19% of the DFAs in the Draft DRECP Preferred Alternative were located on public lands. Utilizing the same methodology used in the Draft DRECP to estimate the amount of development and the technology mix expected in each DFA, the BLM LUPA assumes that about 8,175 MW of renewable energy would be built on BLM land in the Plan Area over the next 25 years, or about 40% of the total amount of development expected in the Plan Area. This is a similar level of development that was assumed on public lands in the Draft DRECP. It should be noted that this assumption is based on several uncertain factors, including the outcome of local planning efforts that may affect renewable energy development on private lands and the ability of renewable energy developers to use highly parcelized private lands.

This higher rate of development assumed to occur on BLM land because of a relative lack of uncertainty compared to private lands. The Draft DRECP assumed private land Development Focus Areas would be further constrained by local planning, and that parcelization would also limit development.

The assumption of 40 percent of renewable energy development in the DRECP area occurring on BLM land by 2040 is higher than historical patterns but in line with more recent trends, as illustrated in Tables F-1 and F-2.

**Table F-1
Solar Project Development in DRECP (>20 MW)**

	Imperial	Kern	Riverside*	San Bernardino	Los Angeles
Total Before 2011¹	0	0	21	387	0
Public Land	0	0	0	0	0
Private Land	0	0	21	387	0
Total 2011 - to date	616	832	800	696	296
Public Land	0	0	800	392	0
Private Land	616	832	0	304	296
In Development	586	542	360	300	50
Public Land	0	0	360	300	0
Private Land	586	542	0	0	50
Total	1202	1374	1181	1383	346
Public Land	0	0	1160	692	0
Private Land	1202	1374	21	691	346

¹ Currently operating, but on-line before 2011

* Riverside County development includes the Coachella Valley, which is not part of the DRECP area.

**Table F-2
Wind Project Development in DRECP (>5 MW)**

	Imperial	Kern	Riverside*	San Bernardino	Los Angeles
Total Before 2011 ¹	0	1,125	583	0	0
Public Land	0	28	258	0	0
Private Land		1,097	325	0	0
Total 2011 - to date	265	1,957	139	0	0
Public Land	265	153	0	0	0
Private Land	0	1,084	139	0	0
In Development	0	180	0	0	0
Public Land	0	0	0	0	0
Private Land	0	180	0	0	0
Total	265	3,262	722	0	0
Public Land	265	181	258	0	0
Private Land	0	3,081	464	0	0

¹ Currently operating, but on-line before 2011

* Riverside County development includes the Coachella Valley, which is not part of the DRECP area.

Prior to 2011, renewable energy development on public lands was limited to a few small wind projects, a majority of which were outside the DRECP area (in the Palm Springs and San Geronio Pass areas). Since 2011, roughly one-third of solar construction in the DRECP area (the Genesis, Desert Sunlight and Ivanpah projects, totaling 1,192 MW) has been on public land. Wind capacity constructed since 2011 has totaled 2,361 MW; only the 265-MW Ocotillo Express project has been on public land. Of the 1,838 MW of solar capacity under development – but not yet operational - in the DRECP, 660 MW is on public land (the 300-MW Stateline project, 250 MW of the McCoy project and 110 MW of the Blythe Solar project⁴).

F.7 Conclusion

The DFAs proposed as part of the BLM LUPA are consistent with the broader assumptions about renewable energy development as described in the Draft DRECP. BLM lands are anticipated to support a portion of the overall development that may occur in the desert. The amount of development assumed on BLM lands was estimated using a methodology consistent with the Draft DRECP. As noted above, this assumption is not meant to predict actual development, but rather to provide a basis of the number of acres for the LUPA’s environmental analysis.

⁴ A long-term contract with a utility or end-user is required for a renewable generation project to be considered “under development.” Permitted capacity at McCoy (750 MW) and Blythe Solar (485 MW) exceeds the amount that is under development.

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