# DATA IN THE DESERT:

## A Comparative Analysis of Clean Energy Planning and Deployment within the DRECP Planning Area

December 2025

Defenders of Wildlife (Defenders) is a national conservation organization with 2.1 million members and supporters nationally, including 316,000 in California. Defenders is dedicated to the protection of all wild animals and plants in their natural communities. To that end, Defenders employs science, public education and participation, media, legislative advocacy, litigation and proactive, on-the-ground solutions to prevent the extinction of species, associated loss of biological diversity and habitat alteration and destruction. We utilize stakeholder collaboration, science-based geospatial analysis and landscape level planning tools in our work. These tools help to protect our remaining natural resources while meeting our energy, housing and economic needs for a sustainable future in California.

We strongly support the development of renewable energy. A low-carbon energy future is critical for California's economy, communities and environment. Achieving this future—and *how* we achieve it—is critical for protecting California's internationally treasured wildlife, landscapes and diverse habitats. We believe transitioning to a renewable energy future need not exacerbate the ongoing extinction crisis. We support thoughtfully planning projects while protecting habitat critical to at-risk species.

Defenders is deeply invested in the conservation of natural resources, wildlife and habitat in California's deserts. We believe "smart-from-the-start" energy planning[1] that uses the best available scientific information and maximum stakeholder input is essential to minimize habitat fragmentation and maximize landscape intactness and connectivity while facilitating California's drive to a clean energy future. Thus, Defenders participates in policy advocacy to achieve these results and to promote outcomes aided by environmental and land use planning and policy.

This report has been prepared by Montara (Emily Leslie, Joe Hack) for Defenders of Wildlife. This report is separate from and unrelated to any work Montara is doing for the California Public Utilities Commission. While Montara provided technical support to Defenders of Wildlife in preparation of this report, Montara does not endorse any specific policy or regulatory measures as a result of this analysis. The California Public Utilities Commission did not participate in this project and does not endorse the conclusions presented in this report.

[1] Defenders of Wildlife. 2012. Smart from the Start-Responsible Renewable Energy Development in the Southern San Joaquin Valley. Headquarters. Washington D.C. https://www.defenders.org/sites/default/files/publications/smart-from-the-start-responsible-renewable-energy-development-southern-san-joaquin-valley.pdf

# Executive Summary

California's desert ecosystems are precious, rare and increasingly imperiled as climate change, wildfires and development threaten species, habitat and biodiversity in these regions. While the deployment of renewable energy is necessary to stabilize the climate and thereby safeguard desert ecosystems, utility-scale solar and wind projects also pose direct threats to many desert species. The need for sustained implementation of thoughtful renewable energy planning in California's deserts can therefore not be overstated.

Eight years of collaboration between the U.S. Bureau of Land Management (BLM), the California Energy Commission (CEC), the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service, and extensive public engagement, resulted in the 2016 adoption of the landmark Desert Renewable Energy Conservation Plan (DRECP) by BLM. The DRECP balances one kind of climate action, in the form of renewable energy development, with another in the form of conservation on BLM lands in California's deserts. The goals of the DRECP are to provide:

- A streamlined process for the development of utility-scale renewable energy generation and transmission in the deserts of Southern California consistent with federal and state renewable energy targets and policies.
- Long-term conservation and management of special-status species and desert vegetation communities, as well as other physical, cultural, scenic and social resources within the DRECP Plan Area through the use of durable regulatory mechanisms.[2]

Under the DRECP, the BLM has sought to direct wind, solar and geothermal development away from the most sensitive BLM lands with high conservation value and toward Development Focus Areas (DFAs) where permitting is streamlined. The intent was to facilitate conservation of the desert and its species by directing needed renewable energy development to areas with lower conservation values, creating clear rules for avoidance, minimization and mitigation of impacts, and aligning state and federal permitting to create a more efficient permitting structure. The DRECP Land Use Plan Amendment only applies to federal lands managed by BLM.

Now that nearly a decade has passed, Defenders of Wildlife undertook a spatial analysis to explore the following questions:

1. **How much renewable energy development <u>has occurred</u> to date in the DRECP Plan Area, and how consistent has it been with the DRECP goals and purpose?**

[2] https://blmsolar.anl.gov/drecp/

2. **How much renewable energy development is planned to occur within the DRECP in the next 15-20 years, and how likely will it be consistent with the DRECP goals and purpose?**

Our analysis has found that development has largely adhered to DRECP goals, as evidenced by the finding that:

- **Renewable energy development on BLM lands has happened where it was supposed to occur.** No renewable energy has been built on non-DFA BLM lands and nearly 15,000 acres of new solar have been built on BLM land within DFAs since the passage of the DRECP.

Additionally, while not wholly attributable to the DRECP, we find that:

- **Projects proposed prior to the DRECP on BLM-designated conservation lands have stalled and not been built.** This seems to indicate that without the expedited permitting of the DFAs, it is more difficult to develop projects on federal lands in the DRECP area.

- **For projects built within the DRECP planning area on non-federal or private land, the majority have occurred near (within 10 miles of) DFAs.** While there could be several reasons for these development patterns, their effect – the concentration of projects in lower conservation value areas – demonstrates the value of landscape level planning for energy development and conservation by reducing sprawl.

- **Renewable energy development has mostly occurred in areas with higher levels of urban and agricultural development or in areas with large DFAs.** Energy development has largely happened in more developed areas on the margins of the DRECP planning area such as the Imperial Valley and degraded non-BLM lands around the cities of Lancaster and Victorville. Where energy development has occurred in less developed areas, such as the I-10 corridor west of Blythe, it has happened almost exclusively in DFAs.

Given this, we have found that renewable energy development on public and private lands has been consistent with goals and objectives of the DRECP. Regarding future development, this analysis finds that:

1. **State and county level land use planning processes should be strengthened to direct renewable energy development to low conservation value lands.** Particular attention should be paid to the seven substations within the DRECP planning area where major renewable energy development is anticipated by 2040 and are surrounded primarily by county and state-jurisdictional land. The Antelope, Coolwater, Imperial Valley, Roadway,

Vincent, Whirlwind and Windhub substations only have 300-3,000 acres of designated DFA within typical interconnection distance. Planned development far exceeding these acreages will likely occur on private land under county permitting authority instead of federal authority. A strengthening of state and county-level land use planning processes to direct renewable energy development to low conservation value lands would be beneficial here.

2. **Given the amount of future energy development that is expected to happen on private land, California should conduct landscape-scale energy and conservation planning for private lands in California's deserts.** The success of the DRECP should be built upon with parallel processes for private lands and state-owned lands.

3. **California's energy resource planning process is mapping new renewable development to DFAs and private disturbed lands in the DRECP planning area.** This suggests the land use screens and criteria implemented by the CEC and the California Public Utilities Commission (CPUC), are effective in allocating development to areas of lower conservation value. The risk of renewable energy development happening in more ecologically intact, undeveloped areas of California's deserts will remain lower over the next 15 years provided the agencies continue to implement the screens and criteria.

Data limitations prevent us from making further claims about the impacts of future development in the DRECP area. For example, the footprints of projects in California interconnection queues are not publicly available. Defenders of Wildlife stresses that increasing the transparency and accessibility of such data would add great value to efforts to ensure that energy development and conservation priorities are aligned in California's deserts.

Finally, Defenders of Wildlife looks forward to supporting appropriately sited projects on designated DFAs especially in the context of the recent passage[3] of federal legislation curtailing incentives for wind and solar development and threats to effectively bar all wind and solar permitting on BLM land.[4] To facilitate advocacy on DRECP issues, Defenders has created a publicly available web map of past and future energy development in the DRECP planning area.[5]

[3] https://zenodo.org/records/15801701
[4] https://heatmap.news/sparks/interior-department-wind-solar-land-use
[5] https://stanford.maps.arcgis.com/apps/mapviewer/index.html?webmap=e8073dfb1cbd4de3b4e45c87908e0ee9

# Background and Context

The adoption of the DRECP by BLM in 2016 created a landscape-level blueprint for renewable energy and conservation of desert ecosystems on BLM lands in the California desert. Recognizing the need to balance renewable energy development with conservation priorities, the DRECP Record of Decision (ROD) identified 388,000 acres of BLM-held lands with high energy potential, access to transmission and low resource conflicts as DFAs. [6] The ROD obligated the BLM to give projects proposed in DFAs expedited permitting among other incentives with the intent of supporting renewable energy development in DFAs and directing development away from more ecologically significant BLM lands. Within the plan boundaries, there are 10,226,300 acres of BLM land governed by the DRECP. The remaining 12,342,600 acres are under private ownership or are publicly owned by entities like the military, California State Parks, California State Lands Commission and local governments, and are not subject to the DRECP.

The DRECP stakeholder process and the Plan that was ultimately adopted represents smart-from-the-start energy planning that uses the best available scientific information and maximum stakeholder input to minimize habitat fragmentation and maximize landscape intactness and connectivity, while facilitating California's drive to a clean energy future.

# Energy Planning in California

California's long-term energy planning processes seek to achieve simultaneous goals: meet the State's greenhouse gas reduction targets while avoiding impacts to the most sensitive natural and working lands. This planning takes place in several forums, including the California Air Resources Board Scoping Plan, the CEC's Integrated Energy Policy Report, the CPUC Integrated Resource Plan (IRP), the California Department of Fish and Wildlife State Wildlife Action Plan (SWAP) and its Energy Companion Plan, and the California Independent System Operator's (CAISO) Transmission Planning Process (TPP) and their 20-year Transmission Outlook.

Based on these proceedings, developers and state planning authorities are making infrastructure investment decisions, which have significant implications for the conservation – or not – of California's landscapes and wildlife. Geospatial data-driven decision-making is critical for making good decisions that balance our clean energy, conservation, and biodiversity goals.

California has made important progress toward incorporating higher-resolution land use and environmental information into energy planning processes with the update of the CEC's Land

[6] https://blmsolar.anl.gov/drecp/

Use Screens for Electric System Planning,[7] and is progressing toward using this information to avoid environmental impacts across the state and is expanding this planning approach to CAISO areas in Nevada and Arizona.[8]

The State of California has brought online about 3,000 MW of new renewable energy resources per year statewide since the DRECP went into effect in 2016.[9] Solar and wind development within the DRECP area has increased 28% from 203,000 acres in 2016 to 261,000 acres in 2025.

Renewable energy development statewide has brought dramatic change to the electricity transmission system and to the landscapes of California. This analysis looks at how this wave of development has been playing out within the DRECP area to develop a better understanding of how the DRECP planning process has worked, what new challenges have emerged and what shifts and trends lie ahead for the desert region.

# Analysis

According to publicly available spatial data,[10] the following amounts of new renewable energy resources have been brought online on public and private lands within the overall DRECP planning area, since the Plan was approved in 2016.

Table 1 summarizes the wind and solar generator capacity in MW, and Table 2 summarizes the land use in acres. We report both values because it is important to understand how much power is generated, as well as the amount of land that is being used. For context, the total peak power on the CAISO system is about 50,000 MW.[11] The total area of California is about 100 million acres and the BLM oversees 15 million acres of public lands in the state.

[7] https://www.energy.ca.gov/publications/2022/land-use-screens-electric-system-planning-using-geographic-information-systems

[8] CPUC Presentation: "IRP Proposed 26-27 CAISO TPP Portfolios and Initial Busbar Mapping Results." November 12, 2025. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/cpuc_tpp-portfolios-and-busbar-webinar-slides_20251112.pdf

[9] https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/electric-generation-capacity-and-energy

[10] The USGS's wind (https://energy.usgs.gov/uswtdb/) and solar (https://energy.usgs.gov/uspvdb/) databases were used to quantify the amount of development that has occurred in the DRECP. Project footprints are based upon satellite imagery and may not reflect the entire permitted project size.

[11] https://www.caiso.com/Documents/CaliforniaISOPeakLoadHistory.pdf

*Table 1. Amount of new renewable resources developed on public and private lands within the DRECP area since the adoption of the DRECP.*

| | Solar Development within DRECP planning area (MW) | DRECP Wind Development within DRECP planning area (MW) |
|---|---|---|
| **2016** | 6,747 | 4,077 |
| **2025** | 13,962 | 4,773 |
| **Percent change** | 107% | 17% |

*Table 2. Acreages of new renewable resources developed on public and private lands within the DRECP area since adoption of the DRECP.*

| | Solar Development within DRECP planning area (acres) | Wind Development within DRECP planning area (acres) |
|---|---|---|
| **2016** | 31,752 | 171,792 |
| **2025** | 69,553 | 192,092 |
| **Percent change** | 119% | 13% |
| **Average MW/Acre (Entire Period)**[12] | 4.98 | 35.99 |

This results in 37,801 acres (59 square miles) of new solar development and 20,300 acres (31.7 square miles) of new wind development in the overall DRECP planning area (public and private) between 2017 and 2025.[13]

## How much development has happened in the DRECP area and where?

The DRECP ROD[14] identified 388,000 acres of BLM-held lands with high energy potential, access to transmission and low resource conflicts as DFAs.[15] Due to their energy potential and low resource conflicts, renewable energy projects sited in DFAs can access expedited permitting by BLM as well as streamlined mitigation requirements by the federal and state wildlife agencies. The DRECP also identified an additional 40,000 acres of Variance Process Lands (VPLs).[16] Like DFAs, VPLs are BLM-held lands that have been identified for renewable energy development

[12] Project footprints are based upon USGS solar and wind databases and may not reflect the entire permitted project size.
[13] Throughout this report, when we use the phrase "within the DRECP Planning Area" we are referring to the overall DRECP area, including both public and private land. Facts referring to BLM land are explicitly identified as such in context.
[14] https://blmsolar.anl.gov/drecp/
[15] https://blmsolar.anl.gov/drecp/dfa/
[16] https://blmsolar.anl.gov/drecp/vpl/

within the DRECP. However, unlike in DFAs under the DRECP, solar projects in VPLs do not qualify for streamlined permitting and must undertake a "specific set of Conservation and Management Actions."[17]

Spatial analysis of publicly available solar development data reveals that 29% of the solar built in the DRECP planning area since 2017 has happened within the DFAs. All remaining acres of solar development have happened on private lands or other public lands not managed by the BLM and thus not subject to the DRECP. Despite multiple projects having been proposed on BLM land[18] outside of DFAs, zero acres of solar have been built on BLM land that is not a DFA or VPL since 2017.

An equivalent analysis of wind development revealed that zero acres of wind have been built on DFAs since 2017.[19] Notably, while all the wind generation projects have been built on private land since 2017, nearly half of the acres of wind projects built during that period are within a mile of a DFA.[20, 21]

[17] https://blmsolar.anl.gov/non-competitive/specific/vpl/
[18] https://eplanning.blm.gov/eplanning-ui/home
[19] Wind projects have been built on BLM land prior to 2016 but haven't since.
[20] The pattern of development observed in the DRECP, where wind farms have been built in close proximity to BLM land without being on them directly, occurs in some places because of the "checkerboard" of private and public land ownership in the desert – a consequence of 19th century land use policies meant to prevent railroad companies from consolidating and selling large parcels of land. See: https://www.zocalopublicsquare.org/american-west-checkerboard-land-ownership-problem/
[21] Proximity to DFAs is a reasonable if not perfect proxy for less impactful development because 1) many of the features that lower the conservation value of DFAs, e.g., previously disturbed, on public lands also affect private land parcels near the DFA making them more likely to have less conservation value and 2) developing resources as close as possible to where development already has happened and is likely to continue, i.e., in DFAs, reduces the overall development sprawl in the DRECP by avoiding the building of additional greenfield transmission and by sparing more ecologically intact areas.

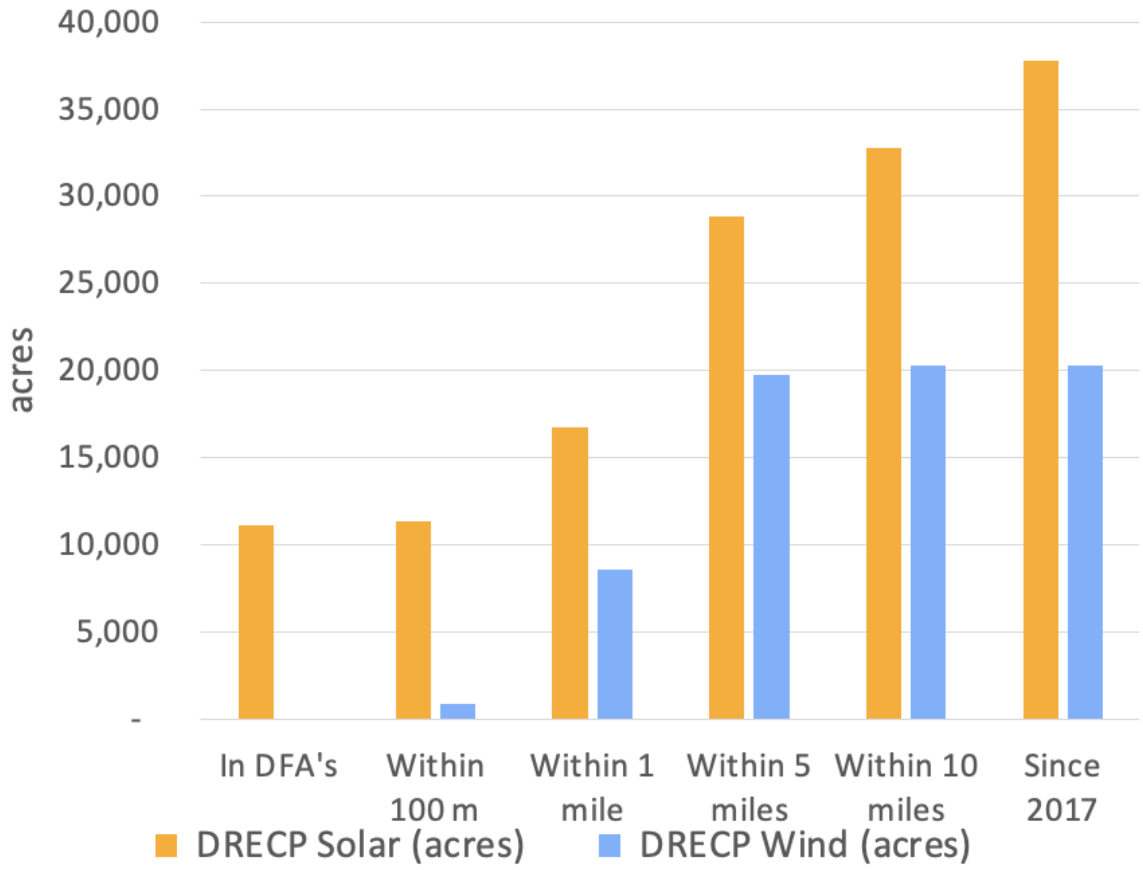


*Figure 1. Acres of new renewable resources developed on public and private lands within the DRECP planning area since 2017 categorized according to DFA proximity.*

The majority (90%) of the renewable energy development in the desert is occurring in four regions. We adopt the following naming conventions for the substations enclosed in each region: “Edwards, Ft. Irwin, China Lake,” “Victorville, Barstow,” “Blythe, Colorado River, Red Bluff,” and “Imperial, Salton Sea.” The regions are shown below in Figure 2.

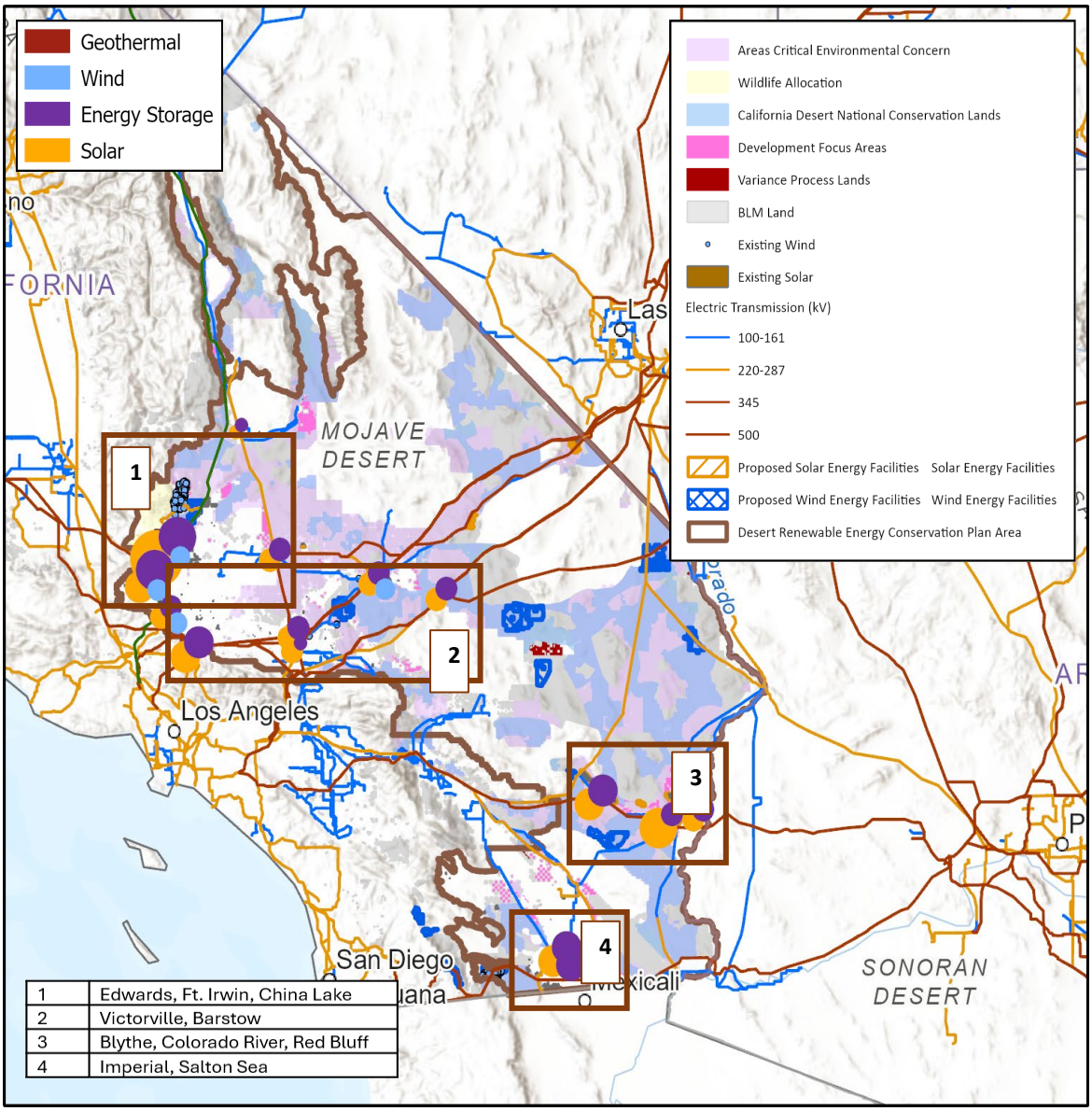


*Figure 2. The four main regions where renewables development has occurred in the DRECP. The colored circles represent additional renewable energy development from the 2025-2026 busbar mapping projections for the year 2040. They are scaled according to size and colored according to the legend at top left in the figure.*

A total of 17,028 acres of renewable energy development in DFAs have occurred in these four regions. See Table 3 below.

*Table 3. Acreages summarizing development to date on DFA lands in the DRECP across the four regions where 90% of renewable energy development has occurred.*

| No. | Region | Description | DFA Lands (acres) | DFA Lands Developed (acres) | DFA Lands Permitted But Not Yet Built (acres) | Remaining DFA Lands (acres) |
|---|---|---|---|---|---|---|
| **1** | **Edwards, Ft. Irwin, China Lake** | Kern County lands along the CA-14 north of Lancaster and West of Edwards AFB | 27,701 | 1,068 | 6,610 | 20,023 |
| **2** | **Victorville, Barstow** | Los Angeles and San Bernardino County lands between Antelope Valley and Barstow | 12,776 | 0 | 0 | 12,776 |
| **3** | **Blythe, Colorado River, Red Bluff** | Riverside County lands along I-10 east of Joshua Tree NP | 147,571 | 15,960 | 21,360 | 110,251 |
| **4** | **Imperial, Salton Sea** | Imperial County lands south of El Centro and west of CA-111 | 567 | 0 | 0 | 567 |
| | | **Totals** | **188,615** | **17,028** | **27,970** | **143,617** |

# How much additional renewable energy development in the DRECP planning area is anticipated in the next 15 years, where will it be sited, and what are its implications for the DRECP?

## California's Long-Term Electric Energy Planning Processes

The CPUC is responsible for developing resource portfolios[22] annually via their IRP as a key input for CAISO's TPP. In simplified terms, the CPUC generates a portfolio specifying which energy resources will be needed, in what quantity and where those resources might be located in a given timeframe. The CPUC then hands off this portfolio to the CAISO who identifies the transmission investments and projects needed in the state to enable the additional renewable energy development to access the transmission system to deliver power. When the CPUC makes their IRPs (portfolios), new renewable energy development and storage are mapped to specific substations through a process called busbar mapping. The busbar mapped portfolios are a rich data source for understanding the local land use and community implications of future development.

These portfolios must not only be compliant with California's emission reduction targets (i.e., the targets the state has set to reduce our greenhouse gas emissions[23]) but also reflect, "state-level land use and environmental planning priorities."[24] The purpose of this analysis is to look closer at the extent to which these portfolios are consistent with the planning priorities of the DRECP, which are included in the "environmental planning priorities" the CPUC is obligated to consider pursuant to the 2022 Memorandum of Understanding among the CPUC, CEC and CAISO.[25]

[22] Resource portfolios are proposed energy (resource) additions designed to meet future energy demand while ensuring electric system reliability and satisfying public policy goals.
[23] The state mandates a move towards 100% renewable and zero-carbon energy by 2045 through the 100 Percent Clean Energy Act (SB 100) https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100
[24] Refer to California Energy Commission Land-Use Screens report, https://efiling.energy.ca.gov/GetDocument.aspx?tn=252354&DocumentContentId=87368 and further information on Land-Use Screens for Electric System Planning, for a thorough description of how land use criteria are used in busbar mapping. https://www.energy.ca.gov/data-reports/california-energy-planning-library/land-use-screens/cec-2023-land-use-screens-electric
[25] https://www.energy.ca.gov/sites/default/files/2023-01/MOU_Dec_2022_CPUC_CEC_ISO_signed_ada.pdf

The remainder of this analysis uses the 2025-2026 TPP busbar mapping results[26] for the year 2040 to describe the impact of future renewable energy development in each of the four areas of interest in the DRECP. See the end of this report for a discussion of CAISO's 20-Year Outlook,[27] which is another prediction of California's future energy mix on the grid. The two products are related as the 20-Year Outlook utilizes CPUC IRP and TPP results as inputs, and both comply with CPUC IRP busbar mapping criteria to the extent practicable.[28]

## How much energy development is expected?

The 2025-2026 TPP busbar mapping assigned development of additional geothermal, solar and wind generation to 20 substations on a mix of different land ownerships within the DRECP study area. Cumulatively, these substations will accommodate 8,819 MW of additional solar development, 886 MW of wind development and 489 MW of geothermal development between 2025 and 2040. Additionally, the TPP anticipates the construction of two new substations for the interconnection of an additional 700 MW of wind and solar generation development. Table 4 below summarizes additional renewable energy and storage development across these substations.

[26] See Modeling Assumptions for Transmission Planning Process, https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2024-26-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp See in particular the busbar mapping dashboard workbook: https://files.cpuc.ca.gov/energy/modeling/LTPP/Full-Dashboard_25-26TPP_BaseCaseD_2025-02-20.xlsx

[27] https://www.caiso.com/notices/2024-20-year-transmission-outlook-posted

[28] https://www.caiso.com/documents/2024-20-year-transmission-outlook-jul-31-2024.pdf, p. 13 and CPUC busbar mapping methodology https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp/mapping_methodology_vruling_2024-09-06.pdf

*Table 4. Additional geothermal, solar and wind generation development anticipated across the DRECP by 2040 per the 2025-2026 TPP.*

| Substation | Geothermal (MW) | Wind (MW) | Solar (MW) | Battery (MW) |
|---|---|---|---|---|
| Antelope | - | 200 | 226 | 128 |
| Blythe | - | - | 160 | 160 |
| Colorado River | - | - | 1,450 | 330 |
| Coolwater | - | 212 | 200 | 119 |
| Imperial Valley | 100 | - | 592 | 728 |
| Inyokern | - | - | 32 | 25 |
| Kramer | - | - | 297 | 275 |
| Lugo | 389 | - | - | - |
| New Sub - Lugo - Pisgah (Proposed) | - | 150 | - | - |
| New Sub - North Gila - IV (Proposed) | - | - | 550 | 165 |
| Pisgah | - | - | 500 | 205 |
| Randsburg | - | - | - | - |
| Red Bluff | - | - | 888 | 771 |
| Roadway | - | - | 245 | 110 |
| Tortilla | - | - | - | - |
| Valley (SCE) | - | - | - | 720 |
| Victor | - | - | 115 | 20 |
| Vincent | - | - | 780 | 774 |
| Whirlwind | - | 300 | 906 | 1,491 |
| Windhub | - | 174 | 2,428 | 1,165 |
| Total | 489 | 1,036 | 9,369 | 6,021 |

## Translating Energy to Land Use

Simple conversion factors were used to translate nameplate capacity (MW) to land use (acres) for the purposes of quantifying the land use implications of additional renewable energy development in the DRECP. For wind and solar generation, power density factors of 40 and 10

acres/MW, respectively, were chosen to align with the assumptions used in busbar mapping.[29] For geothermal, a factor of 25 acres/MW was chosen based on CEC land use screens.[30]

*Table 5. Conversion factors for the major technologies in the DRECP.*

| Resource | Acre/MW Conversion Factor |
|---|---|
| **Wind** | 40 |
| **Solar** | 10 |
| **Geothermal** | 25 |

## Where is energy development planned to occur and is this development likely to be consistent with the terms of the DRECP?

Based on current development patterns, all the anticipated additional renewable energy development planned in the DRECP boundaries over the next 15 years is anticipated to be concentrated in the four main regions described above in Table 3. In these regions, a confluence of favorable site conditions (slope, high wind and solar resource quality, proximity to suitable transmission points of interconnection, the presence of DFAs and lower conservation conflicts) has directed wind and solar development to these areas. Broadly, this is a beneficial outcome of the comprehensive planning done to develop the DRECP that has largely directed development away from ecologically intact areas and towards more urban and agricultural areas with existing transmission infrastructure. This outcome also reflects the busbar allocation processes' commitment to "reflect state-level land use and environmental planning priorities."[31] This paper will present high-level takeaways for these four large regions before providing substation-level analysis.

We used proximity analysis to identify the nearest substation for each DFA, thereby producing summaries at both DFA (coarse) and substation (higher resolution) levels. Table 6 below summarizes available DFA area (acres) as well as planned development (acres) in each region. In three of the four regions, planned development acres exceed what is available within the DFA

[29] 2025-2026 Busbar Mapping Methodology, Detailed Busbar Mapping Steps, p.14. See: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp/mapping_methodology_vruling_2024-09-06.pdf

[30] CEC Land Use Screens 2023, Geothermal Technical Resource Analysis, p.C-47. See: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp/mapping_methodology_vruling_2024-09-06.pdf

[31] 2025-2026 Busbar Mapping Methodology, Guiding Principles, P.6. See: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2025-2026-tpp/mapping_methodology_vruling_2024-09-06.pdf

areas. However, as noted, there is substantial appropriate non-BLM lands available within these regions to accommodate planned energy development. Additionally, in the Blythe Colorado River Red Bluff area, there is sufficient DFA area to accommodate planned development.

Within the DRECP boundary, there are more than 12 million acres of private, state and other non-BLM federal lands, within which there is sufficient lower conservation value land suitable for renewable energy development. In addition to the development on DFA lands, substantial amounts of energy will be developed on private and non-BLM public lands within the DRECP over the next 15 years. To create the best possible outcomes – i.e., siting on lower conflict lands with streamlined permitting – county-level and state-level land use and environmental planning processes should be strengthened across the DRECP planning area to ensure that renewable energy development on non-federal lands happens responsibly.

*Table 6. Anticipated additional renewable energy development and DFA availability across the four major development regions in the DRECP. The table indicates that energy development in three of the four main regions is projected to take up an area far greater than the available DFA acreage. The majority of renewables development will likely happen on private lands in these regions.*

| DRECP Region | DFA Available (acres) | 2040 Solar Allocated (acres) | 2040 Geothermal Allocated (acres) | 2040 Wind Allocated (acres) |
|---|---|---|---|---|
| **Blythe, Colorado River, Red Bluff** | 110,251 | 24,985 | 0 | 0 |
| **Edwards, Ft Irwin, China Lake** | 20,023 | 36,633 | 0 | 18,960 |
| **Imperial, Salton Sea** | 567 | 5,920 | 2,500 | 0 |
| **Victorville, Barstow** | 12,776 | 20,660 | 9,725 | 16,487 |
| **Totals** | **143,617** | **88,198** | **12,225** | **35,447** |

### *Blythe, Colorado River, Red Bluff*

The region along the I-10 corridor encompassing the Blythe, Colorado River and Red Bluff substations features relatively large, contiguous DFAs surrounded by BLM conservation land. These substations are in close proximity to the DFAs and the Colorado River substation is actually sited within the DFA area to the West of Blythe. Substantial DFAs in this region with

access to substations help explain why the majority of the solar development that has taken place within DFAs in the entire DRECP has happened in this region.

In this region, wind and solar projects have been proposed on both DFA land and conservation BLM land. Renewable energy projects on DFA land have been built but projects on BLM conservation lands have stalled and not been built, in alignment with the DRECP's guiding principles. Figure 3 below illustrates this trend; a similar trend was also observed in other areas of the DRECP.

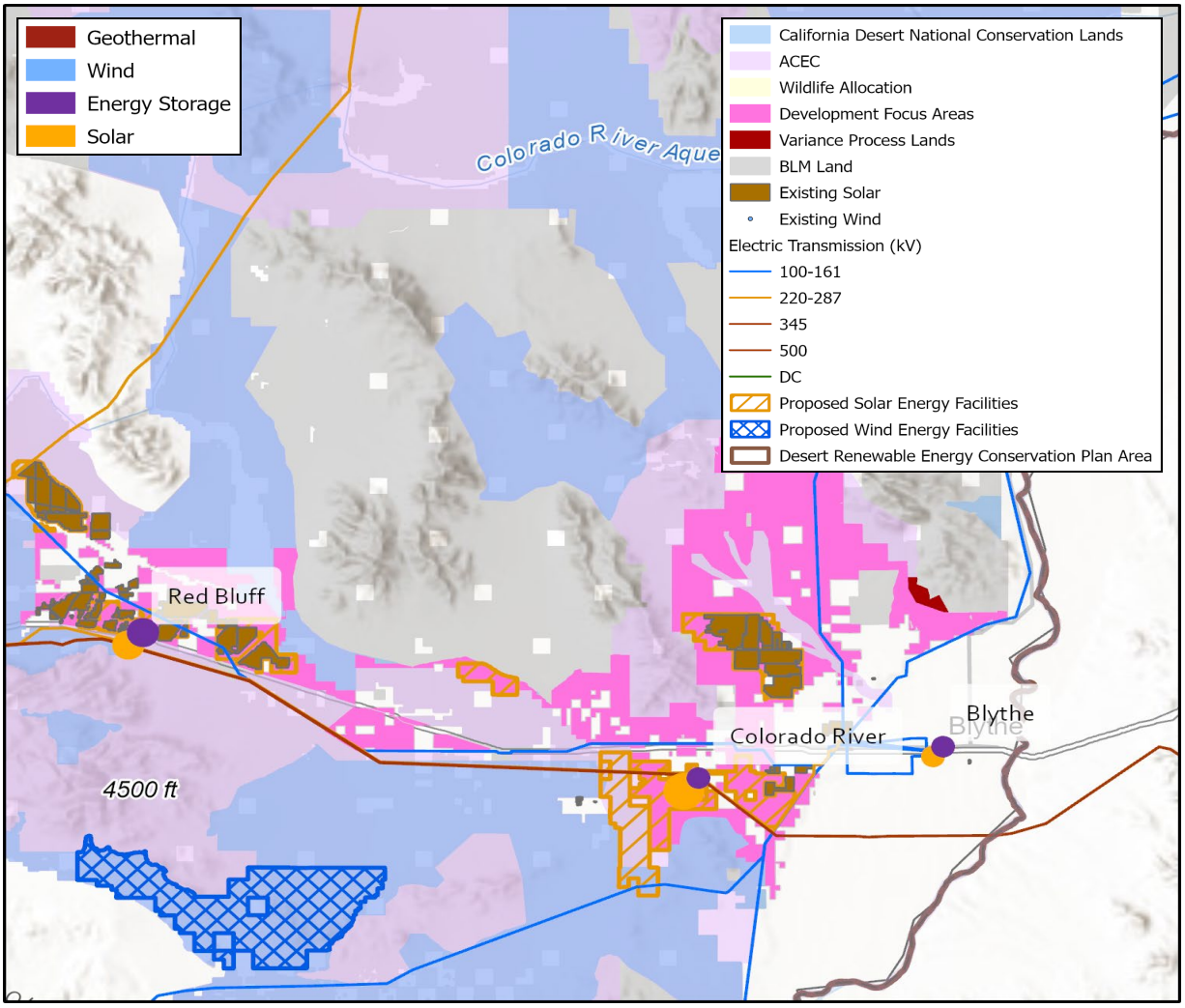


*Figure 3. Existing, proposed and anticipated future wind and solar projects, overlaid with DRECP land use designations in the Blythe area. The overlapping circles are scaled and colored according to the size of future projects. Points of interest: north of the Colorado River substation there is an existing solar project with room for expansion on DFA land. South of the Colorado River substation there was a proposed solar project on DFA land that has not yet been built. To the west there is a proposed solar project on conservation land that has also not been built.*

Looking forward, nearly 25,000 acres of new solar generation development are anticipated in this region by 2040. Thus, there is sufficient remaining area within the DFAs in the region to

accommodate anticipated additional renewable energy development. Moreover, as Table 7 below shows, each substation has enough associated DFA acreage to accommodate the additional renewable energy development that has been specifically assigned to it.

*Table 7. Anticipated additional solar generation development and DFA availability in the Blythe, Colorado River, Red Bluff region. The table shows that each substation has enough DFA area to accommodate anticipated development.*

| Substation | Available DFA (acres) | 2040 Solar Development Allocated (acres) | Additional Development Relative to Available DFA Area | BLM land in 10-Mile Radius (acres) | Non-BLM Land (Private, Other) in 10-Mile Radius (acres) |
|---|---|---|---|---|---|
| **Blythe** | 43,429 | 1,600 | 4% | 36,688 | 164,271 |
| **Colorado River** | 43,429 (Blythe and Colorado River are in close proximity and thus access the same DFAs) | 14,500 | 33% | 148,522 | 52,438 |
| **Red Bluff** | 23,393 | 8,855 | 38% | 173,523 | 27,437 |

For all substations throughout the four DRECP regions, there is more than enough land within a techno-economically feasible interconnection distance (10 mi) to support the planned amount of future renewable energy. In some locations, such as the Blythe area, there is enough designated BLM DFA land to support the new renewable projects with no new development on non-BLM lands. In locations where there is not enough DFA land, the remaining non-BLM land is adequate to support the projections. This can be seen in the area totals summarized in the following four sections of this report.

### *Edwards, Ft. Irwin, China Lake*

This large region encompasses the city of Lancaster, Edwards Air Force Base and the Tehachapi Mountains and includes the Windhub, Whirlwind, Inyokern and Kramer substations. DFAs in this region are fragmented by checkerboards of public and private lands, a legacy of 19th century federal land policy.[32]

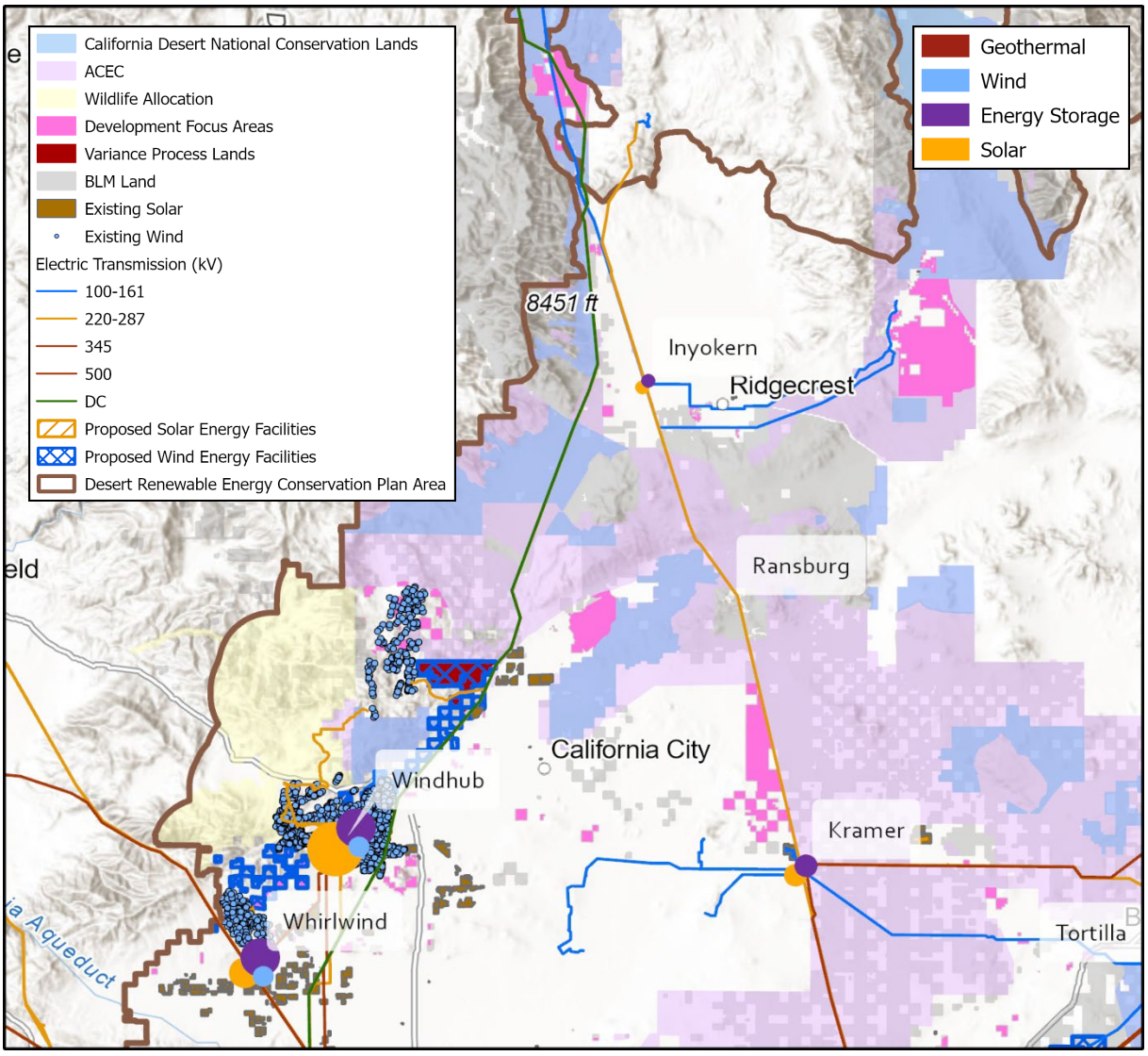


*Figure 4. Existing, proposed and allocated future wind and solar projects, overlaid with DRECP land use designations in the Edwards, Ft. Irwin, China Lake area. Points of interest: in addition to high concentrations of existing wind and solar, there are wind and solar projects that have been proposed but not built on DFA and VPL land in this area.*

More than 55,000 acres of additional wind and solar generation development are expected in this region by 2040 yet less than 21,000 acres of DFAs remain, leading to the conclusion that

[32] https://www.zocalopublicsquare.org/american-west-checkerboard-land-ownership-problem/

much of the development in this region is likely to happen on private or non-BLM public lands. At a substation level, Whirlwind and Windhub have limited acres available within DFAs as much of the DFAs within an economically viable distance to those substations have already been substantially developed or permitted. See the table and figure below for substation-level projections. For all substations in this area, the amount of non-BLM land is adequate to support the projected development, particularly if the state supports land use and environmental planning in this region.

*Table 8. Anticipated additional renewable energy development and DFA availability in the Edwards, Ft. Irwin, China Lake region. At many substations, much DFA area has already been developed.*

| Substation | Available DFA (acres) | 2040 Solar Development Allocated (acres) | 2040 Wind Development Allocated (acres) | Additional Development Relative to Available DFA Area | BLM land in 10-Mile Radius (acres) | Non-BLM Land (Private, Other ) in 10-Mile Radius (acres) |
|---|---|---|---|---|---|---|
| **Inyokern** | 41 | 318 | 0 | 775% | 147,612 | 53,348 |
| **Kramer** | 7,792 | 2,970 | 0 | 38% | 126,854 | 74,106 |
| **Randsburg** | 7,792 (Kramer and Randsburg are in close proximity and thus access the same DFAs) | 0 | 0 | 0% | 157,306 | 43,653 |
| **Whirlwind** | 2,199 | 9,060 | 12,000 | 958% | 10,294 | 190,666 |
| **Windhub** | 2,199 (Whirlwind and Windhub are in close proximity and thus access the same DFAs) | 24,285 | 6,960 | 1,421% | 26,399 | 174,561 |

This analysis paid particular attention to the North of Edwards DFA, which is served by the Kramer substation because of the solar development moratorium pending due to the California Department of Fish and Wildlife and BLM's evaluation of Mohave ground squirrel habitat at the DFA.[33] We examined the CAISO interconnection queue and were unable to find evidence of new

[33] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=222246 at pg. 5

projects proposing to build within the North of Edwards DFA. We strongly support directing projects away from the North of Edwards DFA due to its high value for Mohave ground squirrel conservation.

### *Imperial Valley, Salton Sea*

Southern California Edison's Imperial Valley and Valley substations are in the agricultural areas of southern Imperial County. The nearest DFA to these two substations is more than 10 miles away. Additionally, the DFAs closest to these substations have been designated for geothermal. All the historical development of solar in the region has happened on private lands. This is likely due, in part, to the remoteness of the DFAs from suitable substations for interconnection.

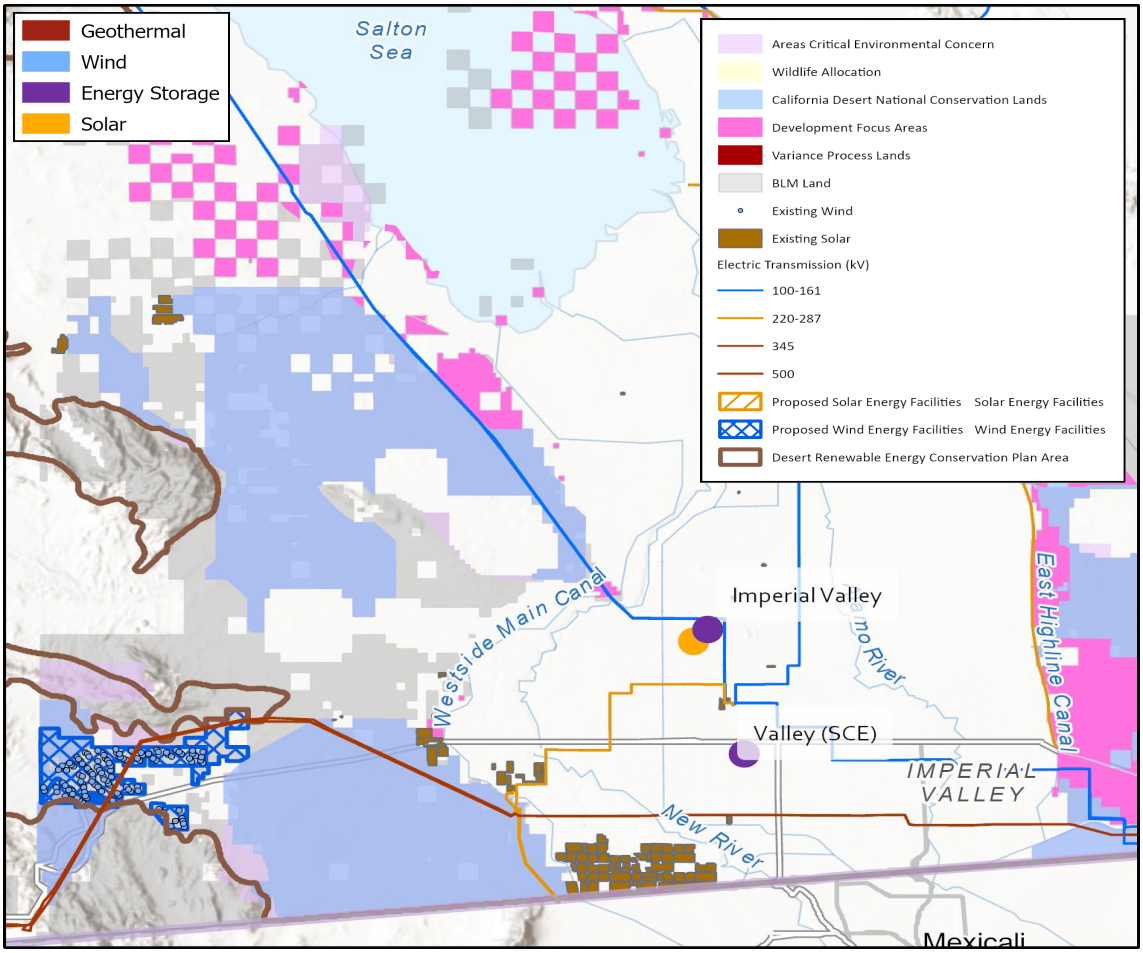


*Figure 5. Existing, proposed and anticipated future wind and solar projects, overlaid with DRECP land use designations in the Imperial and Salton Sea area. Points of interest: There is significant DFA area remaining undeveloped, while the majority of development activity tends to occur on private land in this area. This may be attributable to the relative remoteness of these DFAs from transmission infrastructure. There is an existing wind project with room for expansion on non-conservation BLM land in the southwest of this figure.*

Looking forward, nearly 7,000 acres of solar and geothermal development are anticipated in the region yet only 567 acres of DFA land are within 15 miles of these substations; thus, the bulk of

this development can be anticipated to occur on private lands with closer access to transmission. While geothermal will be sited along the edges of the Salton Sea due to the location of the resource, solar development can be flexibly sited. There is ample agricultural land to accommodate solar development, particularly in light of the dry conditions on the Colorado River.

*Table 9. Anticipated additional solar and wind generation development and DFA availability in the Imperial Valley, Salton Sea region. In this region, DFA areas are generally located far from the two substations that have been allocated additional renewable energy development in busbar mapping, and therefore development is mostly anticipated to take place on private lands.*

| Substation | Available DFA (acres) | 2040 Solar Development Allocated (acres) | 2040 Geothermal Development Allocated (acres) | Additional Development Relative to Available DFA Area | BLM land in 10-Mile Radius (acres) | Non-BLM Land (Private, Other ) in 10-Mile Radius (acres) |
|---|---|---|---|---|---|---|
| **Imperial Valley** | 283 | 5,920 | 2,500 | 2,971% | 12,290 | 188,670 |
| **New Sub - North Gila - IV (Proposed)** [34] | - | 5,500 | 0 | - | - | - |
| **Valley (SCE)** | 283 (Imperial Valley and Valley SCE are in close proximity and thus access the same DFAs) | 0 | 0 | 0% | 2,719 | 198,240 |

[34] This does not include the development at the proposed substation because its location is not publicly available and therefore it is unknown which DFA lands it will serve.

### *Victorville, Barstow*

The Roadway, Pisgah, Coolwater, Victor, Antelope and Lugo substations lie within the Victorville, Barstow region. The majority of anticipated development is likely to occur on private and non-BLM public land in this region. Thus, despite the scarcity of DFA land close to interconnection points, for all substations, the amount of non-BLM land is adequate to support the projected 2040 development. As noted in the other regions, state investment in land use planning would greatly benefit and expedite development of projects on non-BLM lands.

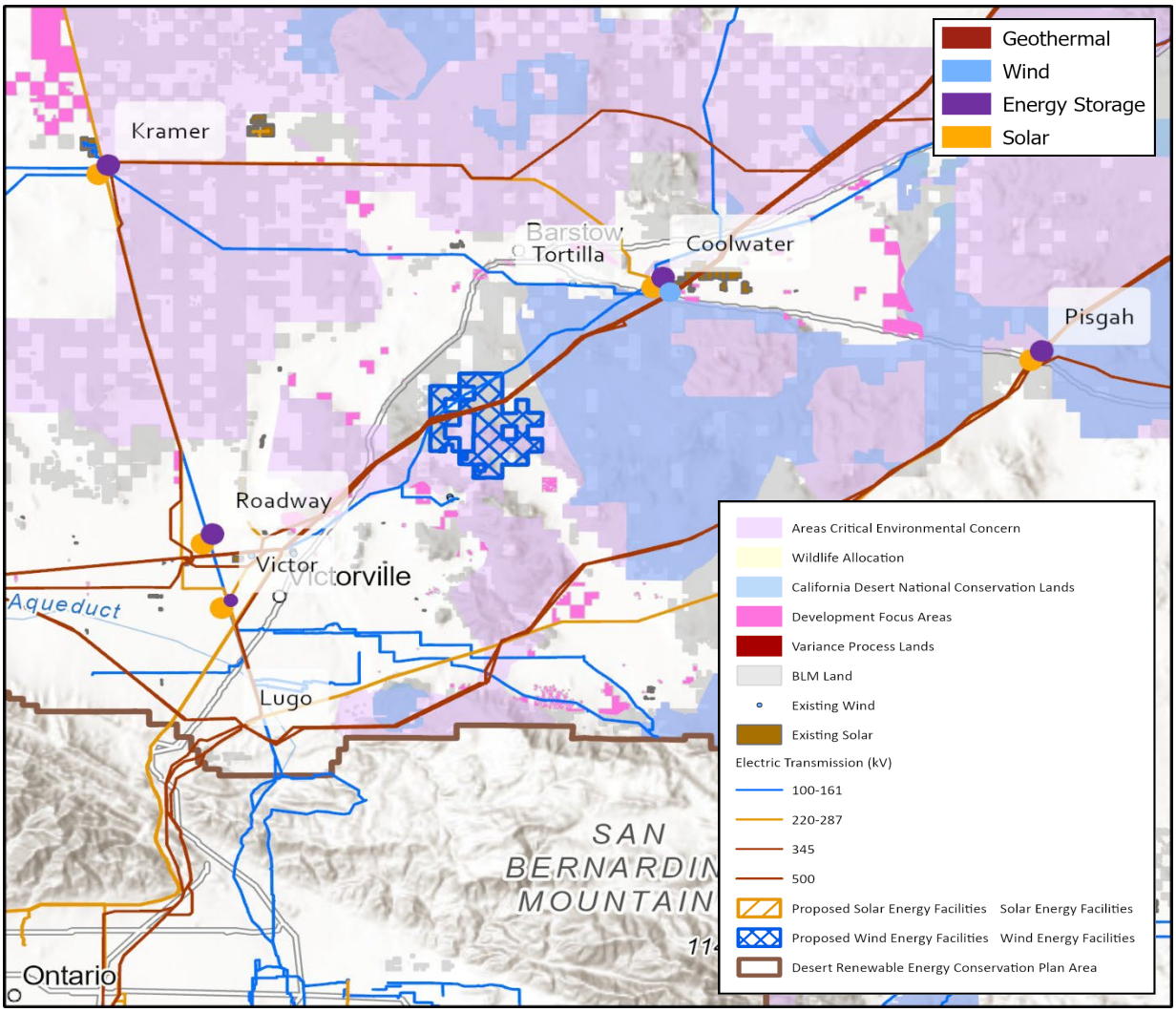


*Figure 6. Existing, proposed and anticipated future wind and solar projects, overlaid with DRECP land use designations in the Victorville, Barstow area. Points of interest: There are small scattered DFA areas remaining undeveloped, while most of the development activity tends to occur on private land. The proposed Lucerne Wind Farm is partially on a BLM Area of Critical Concern in the center of this figure. This wind project was proposed prior to the adoption of the DRECP and not built.*

*Table 10. Anticipated additional renewable energy development and DFA availability in the Victorville, Barstow region. The region has already hosted significant wind and solar development and many of its available DFA areas have largely been developed. Note that a new substation has been proposed between the Lugo and Pisgah substations. Its location is not yet publicly available.*

| Substation | Available DFA (acres) | 2040 Solar Allocated (acres) | 2040 Geothermal Allocated (acres) | 2040 Wind Allocated (acres) | Additional Relative to Available DFA Area | BLM land in 10-Mile Radius (acres) | Non-BLM Land (Private, Other) in 10-Mile Radius (acres) |
|---|---|---|---|---|---|---|---|
| **Antelope** | 2 | 2,260 | 0 | 8,000 | 483,200% | 35,553 | 165,407 |
| **Coolwater** | 3,401 | 2,000 | 0 | 8,487 | 308% | 132,524 | 68,435 |
| **Lugo** | 2,510 | 0 | 9,725 | 0 | 387% | 79,474 | 121,486 |
| **Pisgah** | 3,401 | 5,000 | 0 | 0 | 147% | 181,250 | 19,710 |
| **New Sub - Lugo - Pisgah (Proposed)** [35] | - | 0 | 0 | 6,000 | - | - | - |
| **Roadway** | 763 | 2,450 | 0 | 0 | 321% | 29,920 | 171,039 |
| **Tortilla** | 31 | 0 | 0 | 0 | 0% | 105,203 | 95,756 |
| **Victor** | 2,510 | 1,150 | 0 | 0 | 46% | 9,806 | 191,153 |
| **Vincent** | 158 | 7,800 | 0 | 0 | 4,933% | 84,126 | 116,833 |

# Reconciling The CAISO 20-Year Outlook with the 2025-2026 TPP Base Case Portfolio

Throughout this analysis, we have referred to the 2040 IRP base case portfolio used for CAISO's TPP as the basis for nameplate wind and solar development. For completeness, we also analyzed the 2024 CAISO 20-Year Outlook to extend the timeframe of the study beyond 2040 to 2044. While the 20-Year Outlook extends further out than the TPP portfolio, it was published six

[35] This does not include the development at the proposed substation because its location is not publicly available and therefore it is unknown which DFA lands it will serve.

months before the TPP portfolio and uses the 2023-2024 TPP portfolio as an input.[36] Thus, the 20-Year Outlook is two planning cycles older than the 2025-2026 TPP portfolio from which the 2040 projections analyzed in this paper. Additionally, the 20-Year Outlook does not feed directly into the CAISO TPP process in the same way that the IRP busbar mapping results do.

Despite the differences discussed above, many of the trends in the 2040 TPP portfolio are present in the 20-Year Outlook's portfolio. The additional renewable energy development for the Colorado River, Blythe, Red Bluff and Kramer substations is substantially higher in the 20-Year Outlook than in the 2040 TPP portfolio, and in some cases more than double. Notwithstanding current moratorium on solar development at the DFA near Kramer because of Mohave ground squirrel habitat, the large, contiguous DFAs within an economically viable distance associated with those substations are likely to see further intensive development between 2040 and 2045 according to the 20-Year Outlook.

Another notable feature of the 20-Year Outlook is a substantial downward projection of onshore wind additions at substations across the DRECP. As the 20-Year Outlook notes, the wind projections are from the 2023-2024 TPP base case for the year 2035.[37] A possible explanation why wind projections were revised downward in the 20-Year Outlook for the year 2045 is that offshore wind development was increased from 4,700 MW in the 2023-2024 TPP to 20,000 MW in the 20-Year Outlook following Governor Newsom's request for a 20 GW offshore wind planning goal by 2045.[38] It is possible that onshore wind additions were revised downward because of this large increase in anticipated offshore wind development.

[36] CAISO 20-Year Outlook, p.8 https://www.caiso.com/documents/2024-20-year-transmission-outlook-jul-31-2024.pdf
[37] Ibid., CEC and CPUC Staff Paper, p.17
[38] Ibid., CEC and CPUC Staff Paper, p.17

*Table 11. Anticipated additional renewable energy development from the 20-Year Outlook compared to the 2025 TPP. The 20-Year Outlook features substantial downward revisions of wind and upward revisions of solar relative to the 2025 TPP.*

| | Solar | | | Wind | | |
|---|---|---|---|---|---|---|
| **Substation** | **TPP 2040 (MW)** | **20-Year Outlook 2045 (MW)** | **Difference** | **TPP 2040 (MW)** | **20-Year Outlook 2045 (MW)** | **Difference** |
| **Antelope** | 226 | 2,175 | 862% | 200 | 3 | -99% |
| **Blythe** | 160 | 300 | 88% | - | - | na |
| **Colorado River** | 1,450 | 3,014 | 108% | - | - | na |
| **Coolwater** | 200 | 400 | 100% | 212 | - | na |
| **Imperial Valley** | 592 | 1,400 | 136% | - | - | na |
| **Inyokern** | 32 | 2 | -94% | - | - | na |
| **Kramer** | 297 | 1,260 | 324% | - | - | na |
| **Lugo** | - | 250 | na | - | - | na |
| **New Sub - Lugo - Pisgah (Proposed)** | - | - | na | 150 | - | na |
| **New Sub - North Gila - IV (Proposed)** | 550 | - | na | - | - | na |
| **Pisgah** | 500 | 300 | -40% | - | - | na |
| **Randsburg** | - | - | na | - | - | na |
| **Red Bluff** | 888 | 2,904 | 227% | - | - | na |
| **Roadway** | 245 | 203 | -17% | - | - | na |
| **Tortilla** | - | - | na | - | - | na |
| **Valley (SCE)** | - | - | na | - | - | na |
| **Victor** | 115 | 402 | 250% | - | - | na |
| **Vincent** | 780 | 1,500 | 92% | - | 60 | na |
| **Whirlwind** | 906 | 2,505 | 176% | 300 | 101 | -66% |
| **Windhub** | 2,428 | 2,694 | 11% | 174 | 181 | 4% |

*Table 12. Anticipated additional renewable energy land use compared to available DFA area and general BLM vs. non-BLM (private, state, other federal) land. All substations have enough land to support anticipated development.*

| Substation | Solar 20-yr Outlook 2045 (acres) | Wind 20-yr Outlook 2045 (MW) | Wind 20-yr Outlook 2045 (acres) | Combined RE 20-yr Outlook 2045 (acres) | Available DFA (acres) | BLM Land (acres) | Non-BLM Land (acres) |
|---|---|---|---|---|---|---|---|
| **Antelope** | 21,750 | 3 | 120 | 21,870 | 2 | 35,553 | 165,407 |
| **Blythe** | 3,000 | - | - | 3,000 | 43,429 | 36,688 | 164,271 |
| **Colorado River** | 31,040 | - | - | 31,040 | 43,429 | 148,522 | 52,438 |
| **Coolwater** | 4,000 | - | - | 4,000 | 3,401 | 132,524 | 68,435 |
| **Imperial Valley** | 14,000 | - | - | 14,000 | 283 | 12,290 | 188,670 |
| **Inyokern** | 20 | - | - | 20 | 41 | 147,612 | 53,348 |
| **Kramer** | 12,600 | - | - | 12,600 | 7,792 | 126,854 | 74,106 |
| **Lugo** | 2,500 | - | - | 2,500 | 2,510 | 79,474 | 121,486 |
| **Pisgah** | 3,000 | - | - | 3,000 | 3,401 | 181,250 | 19,710 |
| **Ransburg** | - | - | - | - | 7,792 | 157,306 | 43,653 |
| **Red Bluff** | 29,040 | - | - | 29,040 | 23,393 | 173,523 | 27,437 |
| **Roadway** | 2,030 | - | - | 2,030 | 763 | 29,920 | 171,039 |
| **Tortilla** | - | - | - | - | 31 | 105,203 | 95,756 |
| **Valley (SCE)** | - | - | - | - | 283 | 2,719 | 198,240 |
| **Victor** | 4,020 | - | - | 4,020 | 2,510 | 9,806 | 191,153 |
| **Vincent** | 15,000 | 60 | 2,400 | 17,400 | 158 | 84,126 | 116,833 |
| **Whirlwind** | 25,050 | 101 | 4,040 | 29,090 | 2,199 | 10,294 | 190,666 |
| **Windhub** | 26,940 | 181 | 7,240 | 34,180 | 2,199 | 26,399 | 174,561 |

# Findings

Based on the analysis in this study, we find there is more land available in DFAs than is currently anticipated to be developed for renewable energy in 2040 across the entire DRECP planning area. However, on a more granular scale, we find that only one DFA region (Blythe, Colorado River, Red Bluff) has the necessary DFA area to fully accommodate renewable energy development assigned to substations within its regional boundaries. The three other DFA regions have limited remaining DFA area within an economically viable distance, and thus more of the anticipated development is likely to occur on private and non-BLM land. Significant development has and is anticipated to occur on previously disturbed private urban and agricultural and private land in the area. Increased attention to conservation planning on these lands under county jurisdiction is warranted. The findings of this white paper must be understood in context with an August 1, 2025 Order[39] from the Secretary of Interior giving the department broad latitude to deny approval to wind and solar projects in favor of more "capacity dense" resources, e.g., oil and gas. The prospect of wind and solar effectively being made more difficult to site on federal land will have impacts for the DRECP that are too consequential to analyze here but we do anticipate increased solar and wind development pressure focus on private lands. At the state level, continual review, diligence and monitoring are needed to ensure that energy planning continues to be consistent with the DRECP. We also strongly recommend that the state invest in and support landscape scale conservation efforts for private lands to facilitate smart-from-the-start development on these lands where development may face fewer federal permitting barriers. Adjustments to the state's long-term energy planning processes are frequently necessary and appropriate to keep the state on track toward simultaneous climate and conservation goals.

The DRECP is a leading example of a multi-stakeholder planning process to achieve multidimensional benefits for land use, conservation and climate goals. It was an early contributor to landscape-scale planning best practices for renewable energy siting. The planning has been effective as evidenced by the findings:

1. No renewable energy has been built on non-DFA BLM lands since the passage of the DRECP.
2. Since the DRECP was approved, nearly 15,000 acres of new solar projects have been constructed on BLM land within the DFAs. Notably, none of these developments have

[39] https://www.doi.gov/document-library/secretary-order/so-3438-managing-federal-energy-resources-and-protecting

encountered legal challenges, demonstrating the benefits of building in low-conflict zones designated by stakeholders like the DFAs.

3. Renewable energy development has mostly occurred in areas with higher levels of urban and agricultural development or in areas with large DFAs.
4. All substations with planned renewable energy development by 2040 already have existing disturbance and existing renewable energy projects.

Defenders supports appropriately sited projects on designated DFA land, especially in the context of the changing federal policy environment. We do not support projects on conservation lands, and we urge caution with respect to any decisions that could trigger the construction of new high voltage transmission lines in areas with conservation sensitivity. More information needs to be provided by the energy agencies. For example, CAISO should include geospatial map figures in addition to their line diagrams illustrating the locations of proposed transmission system upgrades and new substations in the annual Transmission Planning Process reports and identification of the footprints, costs and benefits of the large transmission upgrades inherent to the portfolio design choices in the IRP and TPP processes to allow informed participation by conservation and community stakeholders. Other jurisdictions such as California State Lands Commission and counties would do well to perform similar landscape-scale planning processes to build consensus on areas where renewable energy development can be a win for all parties.

Finally, we find that there are several discrepancies between the CPUC IRP (2040 portfolio) and the CAISO 20-Year outlook (2044 portfolio). The CAISO 20-Year outlook has significantly more solar and less wind at Antelope (increasing from 226 to 2175 MW), and more solar at Kramer (increasing from 297 to 1260 MW), Red Bluff (increasing from 888 to 2904 MW) and Whirlwind (increasing from 906 to 2505 MW). The CEC, CPUC and CAISO should work together closely to reconcile, calibrate and adjust these large increases from 2040 to 2045 for feasibility.

# Conclusions and Recommendations

Since its adoption, the DRECP has successfully balanced two types of climate action – the development of renewable energy and the conservation of lands critical to the preservation of biodiversity. Defenders continues to strongly support the DRECP and recommends the following actions to further advance the twin conservation and renewable energy development goals within the DRECP boundaries:

1. **Stronger State and County-level conservation planning processes that direct renewable energy development to low conservation value lands would be beneficial.** There is a need to strengthen State and County-level conservation planning processes to direct renewable energy development to low conservation value private lands around the seven substations within the DRECP planning area where major renewable energy development by 2040 is planned but there is limited land available within the proximate DFAs. The Antelope, Coolwater, Imperial Valley, Roadway, Vincent, Whirlwind and Windhub substations have limited designated DFA lands proximate to planned renewable energy development. As a result, additional renewable energy development will likely occur on private land under county permitting authority instead of federal authority.

2. **Given the amount of future energy development that is expected to happen on private land, California should conduct landscape-scale energy and conservation planning for private lands in California's deserts and the San Joaquin Valley.** The success of the DRECP should be built upon with parallel processes for private and state lands.

3. **CAISO should make available GIS files of project footprints in interconnection applications.** A lack of publicly available GIS files of project footprints is a major impediment to forecasting the land use and environmental implications of future energy development. Requiring that this data be made available would enable stakeholders to more effectively advocate for land use and environmental planning priorities in the DRECP and across all of California.

# Glossary

**Capacity** – A measure of how much power a resource (see below) can generate. Capacity numbers in this document reflect direct current power ratings for inverter-based resources like solar.

**DFA** – Development Focus Area; a BLM land use designation; an area with substantial energy generation potential, access to existing or planned transmission and low resource conflicts.

**DRECP** – The Desert Renewable Energy Conservation Plan; a landmark agreement by the BLM adopted in 2016 to balance the development of energy resources in California's desert with conservation. At a high level, it created DFAs and expedited permitting processes for energy development within them while also designating other federal lands for conservation.

**DRECP planning area (planning area)** – The overall DRECP area, including both public and private land. Except where explicitly stated, this term refers to the BLM-held lands within the DRECP boundaries where the DRECP's provisions are in effect.

**MW** – Megawatts. A unit of power, equal to 1 million watts. Often used when discussing the output of wind turbines, solar panels or other electricity generators. Used to quantify the instantaneous electrical output of a facility at a moment in time.

**Nameplate Capacity** – The maximum electrical power a facility can generate under ideal conditions, expressed in units of MW.

**Resource** – Any plant of equipment used to convert energy into electricity.

**Resource Additions** – Newly constructed resource capacity, e.g., solar and wind development will result in 150 MW of resource additions at the Red Bluff substation by 2045.

**VPL** – Variance Process Land; a BLM land use designation; an area tending to have low to moderate ecological value where renewable energy development may be considered and could be approved without a plan amendment. VPLs are open for solar energy applications; however, all solar energy development applications have to follow a variance process before the BLM determines whether to continue processing them. The permitting requirements on VPLs are therefore more restrictive than on DFAs.

# Appendix A

Below is a table summarizing the utilization of each DFA that has already been developed or which may be developed because it is proximal to a substation that has been allocated additional renewable energy development in the 2025-2026 busbar mapping results. The DFA numbers in the "Label" column refer to the row number of each DFA in the shapefile that was used in this analysis.[40]

| Label | Proximate Substations | Region | Renewable Energy Developed to Date (acres) | Acres Permitted (acres) | Total Area (acres) | Remaining Available DFA (acres) |
|---|---|---|---|---|---|---|
| **DFA_108** | Imperial Valley, Valley (SCE) | Imperial, Salton Sea | - | - | 567 | 567 |
| **DFA_48, DFA_47** | Blythe, Colorado River | Blythe, Colorado River, Red Bluff | 7,310 | 15,917 | 110,084 | 86,858 |
| **DFA_49, DFA_47** | Red Bluff | | 8,650 | 5,443 | 37,487 | 23,393 |
| **DFA_54** | Vincent | Victorville, Barstow | - | - | 158 | 158 |
| **DFA_55** | Antelope | | - | - | 2 | 2 |
| **DFA_56** | Lugo, Victor | | - | - | 5,020 | 5,020 |
| **DFA_57** | Roadway | | - | - | 763 | 763 |
| **DFA_58** | Coolwater, Pisgah | | - | - | 6,801 | 6,801 |
| **DFA_68** | Tortilla | | - | - | 31 | 31 |
| **DFA_73, DFA_101** | Whirlwind, Windhub | Edwards, Ft. Irwin, China Lake | 1,068 | 3,755 | 9,221 | 4,399 |
| **DFA_92** | Kramer, Rendsburg | | - | 2,855 | 18,438 | 15,583 |
| **DFA_96** | Inyokern | | - | - | 41 | 41 |

[40] https://www.arcgis.com/home/item.html?id=4dda40a263db45a399d7e2650427290c#overview

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