UC SANTA BARBARA
The 2035 Initiative

# The Demand Side Grid Support (DSGS) Program: Participation Rates Across California

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April 2026



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# SUMMARY & KEY FINDINGS

- DSGS is California's only statewide virtual power plant (VPP) program. It has proven to be one of the state's most effective clean reliability resources, **scaling to more than 1 GW (1,000,000 kW) of dispatchable capacity in less than three years**—as large as a nuclear plant.
- **During the 2025 program year, more than 203,000 sites enrolled in DSGS** Options 3 (Behind-the-Meter Storage VPP) and 4 (Emergency Load Flexibility VPP) statewide, representing approximately 1,367 MW (1,367,000 kW) of nameplate capacity—enough to power the peak electricity demand for all of San Francisco.
- According to an independent analysis by the Brattle Group, **DSGS could generate $206 million in net system cost savings for California ratepayers if funded through 2028.**[1] The program is especially critical as contracts for aging fossil-fueled peaker plants expire at the end of 2026, providing a clean, low-cost alternative to keep the lights on during peak demand, especially during extreme grid events or stress.
- Despite achieving more than 1 GW (1,000,000 kW) of capacity, **DSGS has been allowed to keep only $109.5 million of its $314 million authorized funding**—just 35% of what was originally provided before clawbacks in 2024. The program was not included in the 2025–26 state budget and is expected to run out of funding by the end of 2026 without legislative action.
- The program reaches communities across the state, with **participation in every legislative district, and 53 of 58 counties**, demonstrating broad geographic reach.
- On a per capita basis, **participation is strong across diverse communities**—from suburban San Diego (11.2 sites per 1,000 residents) to rural foothill counties like Calaveras (11.4) and agricultural regions like Tulare (11.1).
- DSGS is a program for all Californians—including lower income customers. According to county-level data from Lawrence Berkeley National Laboratory, **one in four DSGS sites are in counties where the median solar adopter earns below $100,000**, and counties with lower-income solar adopters tend to have higher per capita DSGS participation rates.

This memo documents the breadth and depth of participation in the Demand Side Grid Support (DSGS) program under Options 3 and 4, broken down by California State Senate district, Assembly district, and county. The data demonstrates that DSGS has achieved remarkable geographic reach and scale, with more than 203,000 sites enrolled during the 2025 program year, providing over 1 GW (1,000,000 kW) of clean, dispatchable capacity across the state. The accompanying maps and tables show where this capacity is located and which legislators represent the communities benefiting most from the program. This report draws on official participation data from the California Energy Commission and cross-references county-level income data from Lawrence Berkeley National Laboratory's Residential Solar-Adopter Income and Demographic Trends report (2024 Update) to estimate the equity dimensions of program participation.

1 Hledik, R., Peters, K., and Lohiya, P. The Demand Side Grid Support Program: An Assessment of Scale and Value. The Brattle Group. December 2025 Update. *Note this report only covers Option 3 so the value is likely higher if Option 4 was also included.* (https://www.brattle.com/wp-content/uploads/2025/12/The-Demand-Side-Grid-Support-Program-An-Assessment-of-Scale-and-Value-December-2025-Update.pdf)

# PROGRAM OVERVIEW

The DSGS program, created by AB 205 (2022) as part of the California Energy Commission's Strategic Reliability Reserve, is California's only statewide virtual power plant program. Using existing grid infrastructure, DSGS coordinates distributed energy resources—primarily home battery systems—to provide clean emergency capacity, protect ratepayers from electricity price spikes, and enable the transition away from fossil-fueled peaker plants. The program also cuts energy costs for all ratepayers, because it lowers the cost of power when the grid is constrained. And the program is not even paid for by ratepayers. The program is administered by the CEC with a single program administrator (Olivine) and one statewide set of guidelines, keeping administrative costs low: just $13 million in administrative costs from 2022–2025 to unlock 1,145 MW (1,145,000 kW) of capacity, while paying $62.5 million directly to participating customers.

**Option 3, the "Market-Aware Storage VPP,"** enrolls battery storage resources that are dispatchable between 4 PM and 9 PM daily. It is triggered when the CAISO day-ahead locational marginal price exceeds $200 per megawatt hour or during grid emergencies called by balancing authorities. This market-aware design means resources are deployed before grid emergencies escalate, preventing shortages rather than merely responding to them. Option 3 accounts for 129,286 enrolled sites (63.4% of all DSGS enrollments) and 1,176 MW (1,176,000 kW) of capacity (86.0% of total DSGS capacity), with a median system size of approximately 5 kW. In 2025, Option 3 regularly delivered more than 500 MW (500,000 kW) from networked home batteries during test events—representing more than half of San Francisco's peak energy demand.

**Option 4, the "Emergency Load Flexibility VPP,"** enrolls resources that are dispatchable between 4 PM and 10 PM during grid emergencies in response to Energy Emergency Alert (EEA) notices issued by a California balancing authority. Option 4 resources include smart thermostats and other eligible load reduction devices enrolled through device manufacturers or aggregators. Option 4 contributes 74,581 enrolled sites (36.6% of all DSGS enrollments) and 191 MW (191,000 kW) of capacity (14.0% of total DSGS capacity), with a typical enrollment size of 2.5 kW per device.

It is worth noting that Option 4 was not available in PG&E service territory during the 2025 program year, which significantly affects the geographic distribution of participation. Because PG&E serves much of Northern and Central California, the exclusion of Option 4 from that territory means that statewide participation numbers—and particularly the numbers in Northern California—would be substantially higher if Option 4 had been available to all California customers. This also helps explain the concentration of overall participation in Southern California, where both options were available.

It is also important to note that DSGS has achieved its current scale despite receiving only a fraction of its authorized funding. When created by AB 205 in 2022, DSGS was allocated $295 million, later increased to $314 million in 2023. However, the program has received just $109.5 million to date—35% of its authorized budget. DSGS was not included in the 2025–26 state budget, and without further legislative action, the program is expected to exhaust its remaining funds by the end of 2026. The participation data in this report underscore what would be at risk: more than 1 GW (1,000,000 kW) of clean, dispatchable capacity from over 200,000 households across every legislative district in the state.

# 1. LEGISLATIVE DISTRICT ANALYSIS

## 1.1 Senate Districts

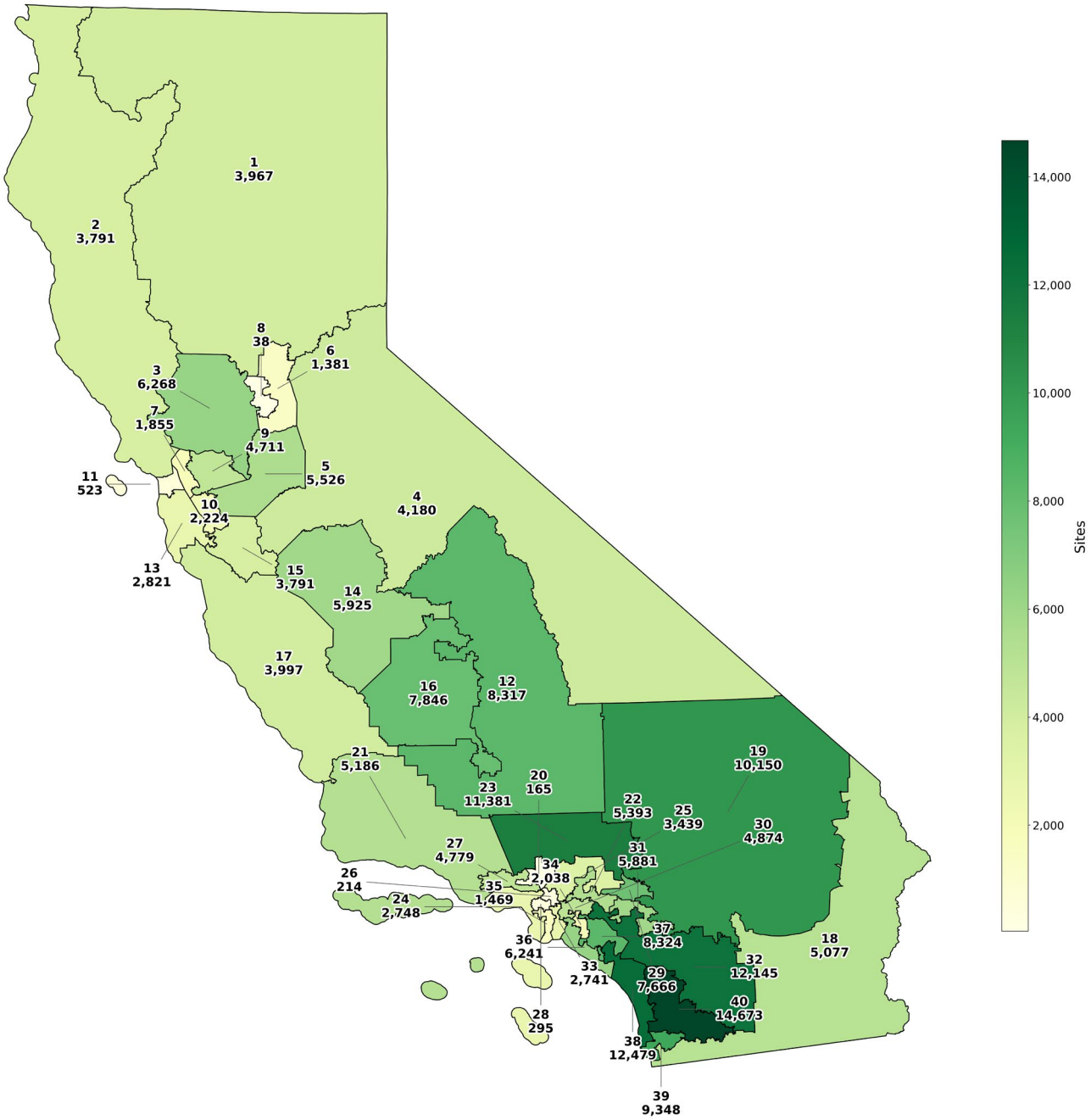
DSGS participation is strong across all 40 State Senate districts (Figure 1), with the highest concentrations in the Inland Empire, San Diego, and Central Valley. Senate District 40 (Sen. Brian W. Jones, R), covering eastern San Diego County, leads with 14,673 enrolled sites and 66,673 kW of capacity. Senate District 38 (Sen. Catherine Blakespear, D) in coastal North San Diego County has 12,479 sites, and Senate District 32 (Sen. Kelly Seyarto, R) in southwest Riverside County has 12,145 sites.

When ranked by capacity (Figure 2), Senate District 12 (Sen. Shannon Grove, R), covering Kern County and the southern Central Valley, leads with 73,766 kW. This reflects larger system sizes in agricultural regions where properties tend to have more space and higher energy consumption. The Central Valley's strong showing demonstrates that DSGS is delivering grid benefits well beyond the coastal urban centers.

**Top 15 Senate Districts by Participation Sites**

| Rank | District | Senator | Party | Total Sites | Capacity (kW) |
|---|---|---|---|---|---|
| #1 | SD-40 | Brian W. Jones | Republican | 14,673 | 66,673 |
| #2 | SD-38 | Catherine Blakespear | Democrat | 12,479 | 60,276 |
| #3 | SD-32 | Kelly Seyarto | Republican | 12,145 | 67,767 |
| #4 | SD-23 | Suzette Martinez Valladares | Republican | 11,381 | 67,394 |
| #5 | SD-19 | Rosilicie Ochoa Bogh | Republican | 10,150 | 65,039 |
| #6 | SD-39 | Akilah Weber Pierson | Democrat | 9,348 | 49,229 |
| #7 | SD-37 | Steven Choi | Republican | 8,324 | 38,460 |
| #8 | SD-12 | Shannon Grove | Republican | 8,317 | 73,766 |
| #9 | SD-16 | Melissa Hurtado | Democrat | 7,846 | 58,936 |
| #10 | SD-29 | Eloise Gomez Reyes | Democrat | 7,666 | 43,373 |
| #11 | SD-3 | Christopher Cabaldon | Democrat | 6,268 | 56,467 |
| #12 | SD-36 | Tony Strickland | Republican | 6,241 | 31,774 |
| #13 | SD-14 | Anna Caballero | Democrat | 5,925 | 55,664 |
| #14 | SD-31 | Sabrina Cervantes | Democrat | 5,881 | 36,007 |
| #15 | SD-5 | Jerry McNerney | Democrat | 5,526 | 51,490 |

## Figure 1. DSGS Option 3 & 4 Participation by Senate District: Total Site Count

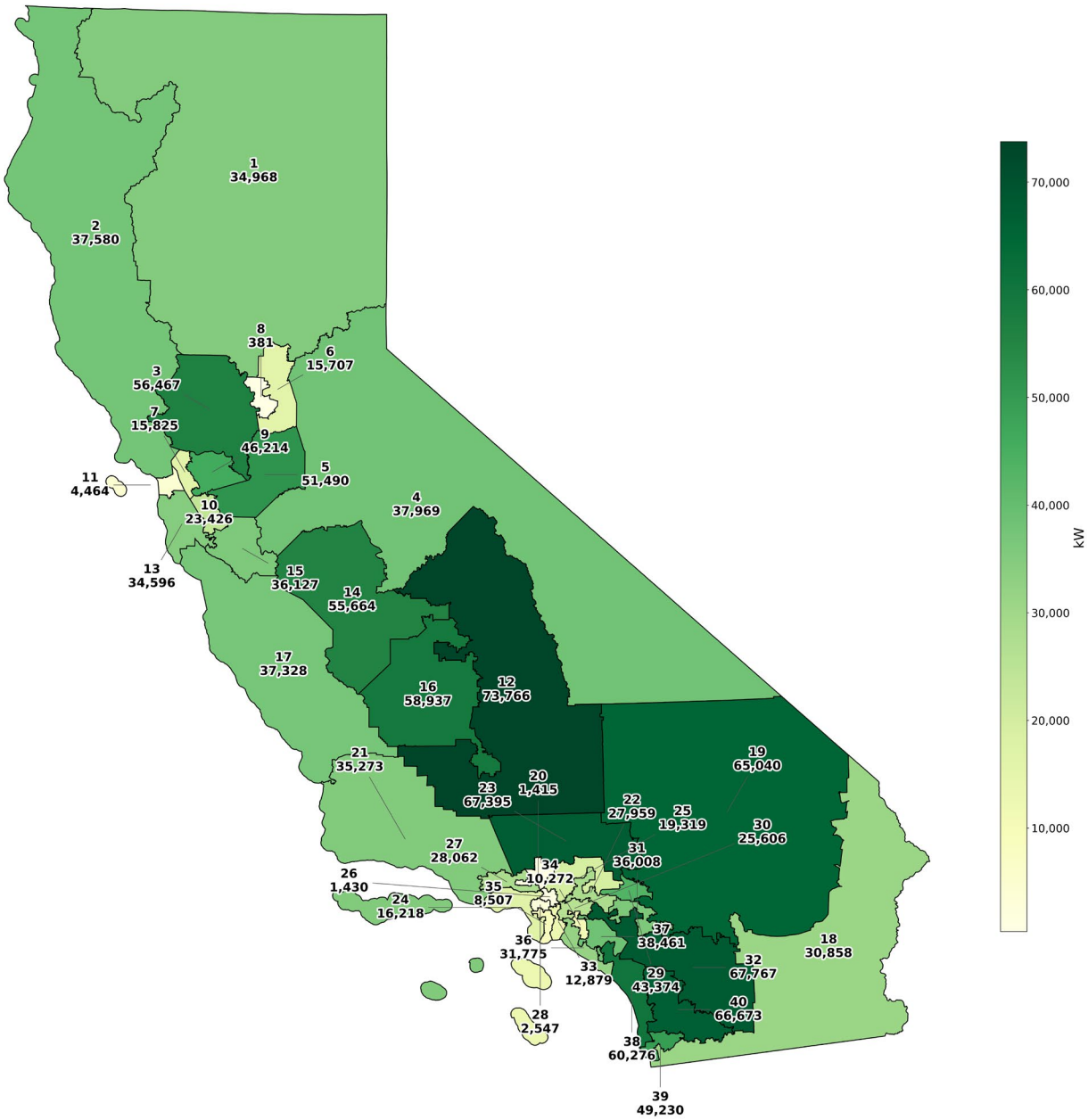


**Top 15 Senate Districts by Capacity (kW)**

| Rank | District | Senator | Party | Total Sites | Capacity (kW) |
|---|---|---|---|---|---|
| #1 | SD-12 | Shannon Grove | Republican | 8,317 | 73,766 |
| #2 | SD-32 | Kelly Seyarto | Republican | 12,145 | 67,767 |
| #3 | SD-23 | Suzette Martinez Valladares | Republican | 11,381 | 67,394 |
| #4 | SD-40 | Brian W. Jones | Republican | 14,673 | 66,673 |
| #5 | SD-19 | Rosilicie Ochoa Bogh | Republican | 10,150 | 65,039 |
| #6 | SD-38 | Catherine Blakespear | Democrat | 12,479 | 60,276 |
| #7 | SD-16 | Melissa Hurtado | Democrat | 7,846 | 58,936 |
| #8 | SD-3 | Christopher Cabaldon | Democrat | 6,268 | 56,467 |
| #9 | SD-14 | Anna Caballero | Democrat | 5,925 | 55,664 |
| #10 | SD-5 | Jerry McNerney | Democrat | 5,526 | 51,490 |
| #11 | SD-39 | Akilah Weber Pierson | Democrat | 9,348 | 49,229 |
| #12 | SD-9 | Tim Grayson | Democrat | 4,711 | 46,213 |
| #13 | SD-29 | Eloise Gomez Reyes | Democrat | 7,666 | 43,373 |
| #14 | SD-37 | Steven Choi | Republican | 8,324 | 38,460 |
| #15 | SD-4 | Marie Alvarado-Gil | Republican | 4,180 | 37,968 |



**Figure 2. DSGS Option 3 & 4 Participation by Senate District: Total Nameplate Capacity (kW)**



# 1.2 Assembly Districts

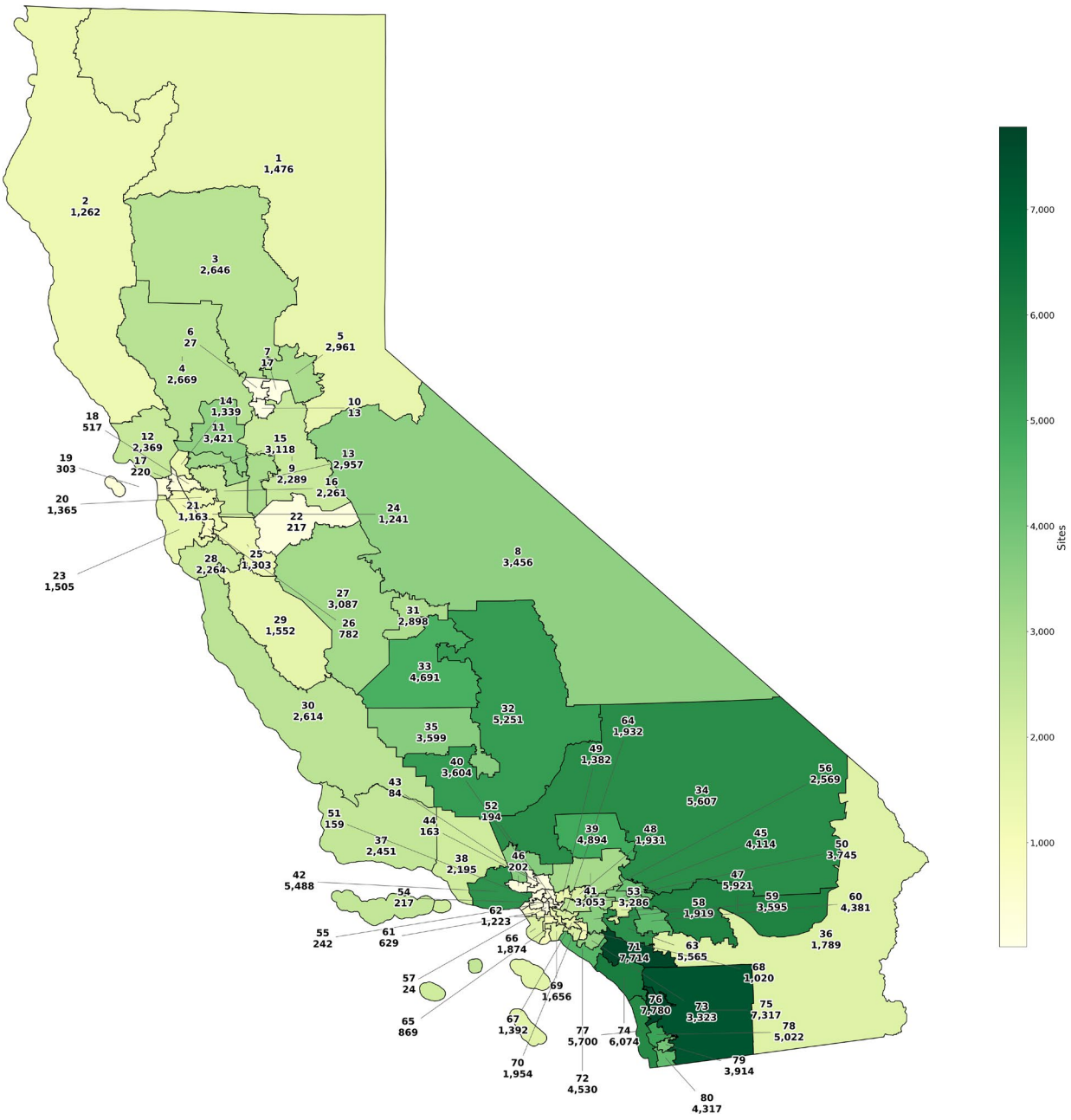
At the Assembly level, all 80 districts have DSGS participants (Figure 3), with the strongest uptake in San Diego, the Inland Empire, and the Central Valley. Assembly District 76 (Asm. Darshana Patel, D), in central San Diego County, leads with 7,780 enrollments. Assembly District 71 (Asm. Kate Sanchez, R) in southwestern Riverside County follows closely at 7,714 sites, and Assembly District 75 (Asm. Carl DeMaio, R) in eastern San Diego has 7,317 sites.

By capacity (Figure 4), Assembly District 32 (Asm. Stan Ellis, R) in the Kern County and Central Valley area leads with 43,614 kW, mirroring the Senate-level pattern of larger system sizes in agricultural regions. The broad distribution across Assembly districts underscores that benefits of DSGS participation are reaching constituents in every corner of the state.

**Top 20 Assembly Districts by Participation Sites**

| Rank | District | Legislator | Party | Total Sites | Capacity (kW) |
|---|---|---|---|---|---|
| #1 | AD-76 | Darshana Patel | Democrat | 7,780 | 33,808 |
| #2 | AD-71 | Kate Sanchez | Republican | 7,714 | 39,420 |
| #3 | AD-75 | Carl DeMaio | Republican | 7,317 | 38,931 |
| #4 | AD-74 | Laurie Davies | Republican | 6,074 | 28,910 |
| #5 | AD-47 | Greg Wallis | Republican | 5,921 | 38,110 |
| #6 | AD-77 | Tasha Boerner | Democrat | 5,700 | 25,888 |
| #7 | AD-34 | Tom Lackey | Republican | 5,607 | 38,770 |
| #8 | AD-63 | Bill Essayli | Republican | 5,565 | 34,158 |
| #9 | AD-42 | Jacqui Irwin | Democrat | 5,488 | 30,818 |
| #10 | AD-32 | Stan Ellis | Republican | 5,251 | 43,614 |
| #11 | AD-78 | Christopher Ward | Democrat | 5,022 | 24,486 |
| #12 | AD-39 | Juan Carrillo | Democrat | 4,894 | 28,855 |
| #13 | AD-33 | Alexandra Macedo | Republican | 4,691 | 33,218 |
| #14 | AD-72 | Diane Dixon | Republican | 4,530 | 20,833 |
| #15 | AD-60 | Corey Jackson | Democrat | 4,381 | 25,120 |
| #16 | AD-80 | David Alvarez | Democrat | 4,317 | 24,061 |
| #17 | AD-45 | James Ramos | Democrat | 4,114 | 23,769 |
| #18 | AD-79 | LaShae Sharp-Collins | Democrat | 3,914 | 21,971 |
| #19 | AD-50 | Robert Garcia | Democrat | 3,745 | 21,092 |
| #20 | AD-40 | Pilar Schiavo | Democrat | 3,604 | 19,442 |

## Figure 3. DSGS Option 3 & 4 Participation by Assembly District: Total Site Count

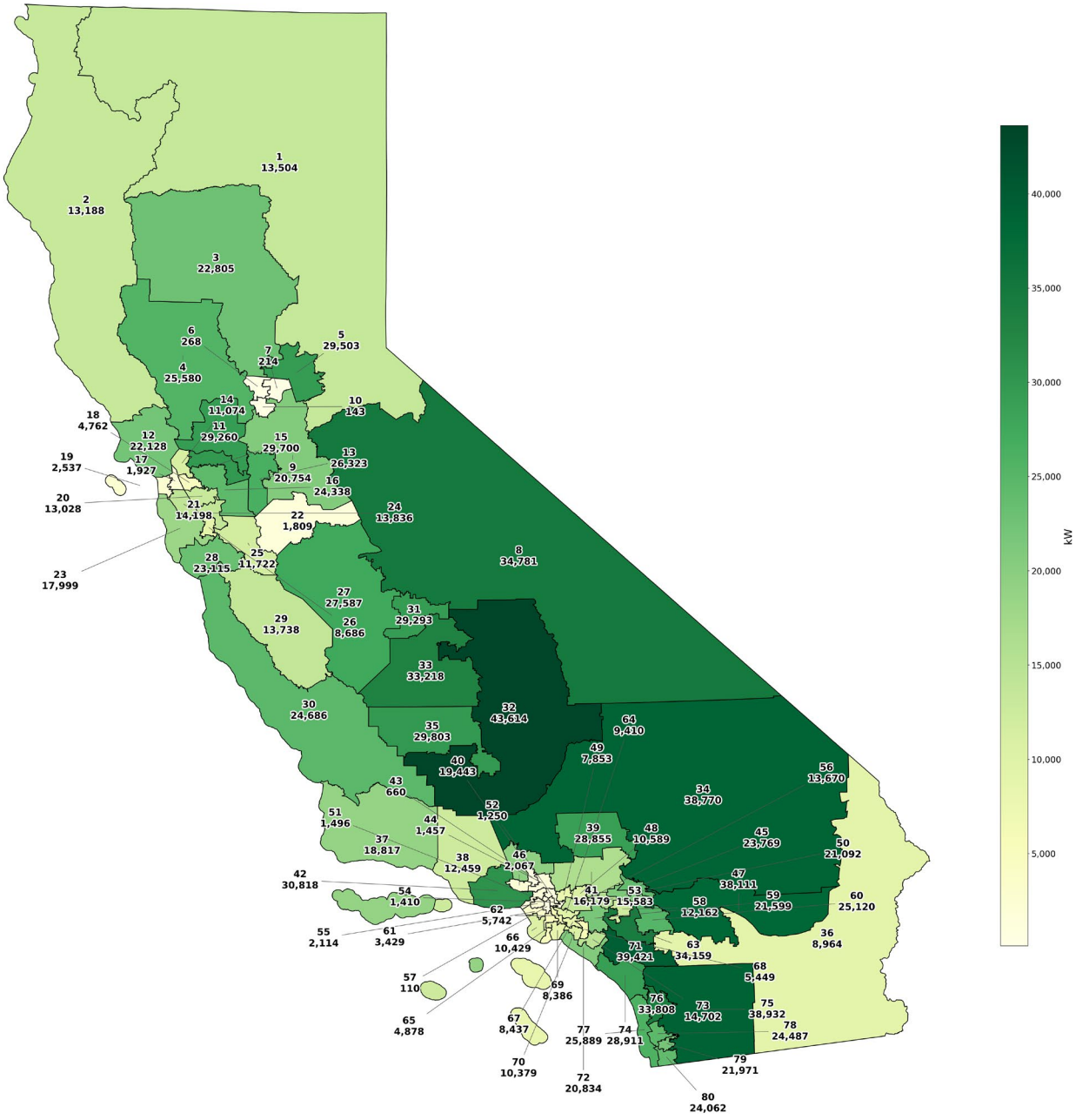


**Top 20 Assembly Districts by Capacity (kW)**

| Rank | District | Legislator | Party | Total Sites | Capacity (kW) |
|---|---|---|---|---|---|
| #1 | AD-32 | Stan Ellis | Republican | 5,251 | 43,614 |
| #2 | AD-71 | Kate Sanchez | Republican | 7,714 | 39,420 |
| #3 | AD-75 | Carl DeMaio | Republican | 7,317 | 38,931 |
| #4 | AD-34 | Tom Lackey | Republican | 5,607 | 38,770 |
| #5 | AD-47 | Greg Wallis | Republican | 5,921 | 38,110 |
| #6 | AD-8 | David Tangipa | Republican | 3,456 | 34,780 |
| #7 | AD-63 | Bill Essayli | Republican | 5,565 | 34,158 |
| #8 | AD-76 | Darshana Patel | Democrat | 7,780 | 33,808 |
| #9 | AD-33 | Alexandra Macedo | Republican | 4,691 | 33,218 |
| #10 | AD-42 | Jacqui Irwin | Democrat | 5,488 | 30,818 |
| #11 | AD-35 | Jasmeet Bains | Democrat | 3,599 | 29,803 |
| #12 | AD-15 | Anamarie Avila Farias | Democrat | 3,118 | 29,699 |
| #13 | AD-5 | Joe Patterson | Republican | 2,961 | 29,502 |
| #14 | AD-31 | Joaquin Arambula | Democrat | 2,898 | 29,292 |
| #15 | AD-11 | Lori Wilson | Democrat | 3,421 | 29,259 |
| #16 | AD-74 | Laurie Davies | Republican | 6,074 | 28,910 |
| #17 | AD-39 | Juan Carrillo | Democrat | 4,894 | 28,855 |
| #18 | AD-27 | Esmeralda Soria | Democrat | 3,087 | 27,587 |
| #19 | AD-13 | Rhodesia Ransom | Democrat | 2,957 | 26,322 |
| #20 | AD-77 | Tasha Boerner | Democrat | 5,700 | 25,888 |



## Figure 4. DSGS Option 3 & 4 Participation by Assembly District: Total Capacity (kW)



# 2. COUNTY ANALYSIS - PER CAPITA PARTICIPATION

Adjusting for population reveals that DSGS participation is reaching communities of all sizes across California (Figure 5). Calaveras County leads the state with 11.4 enrolled sites per 1,000 residents, closely followed by San Diego County (11.2 per 1,000) and Tulare County (11.1 per 1,000). The fact that a large urban county like San Diego achieves per capita participation rates comparable to small rural counties demonstrates the program's broad appeal and scalability.

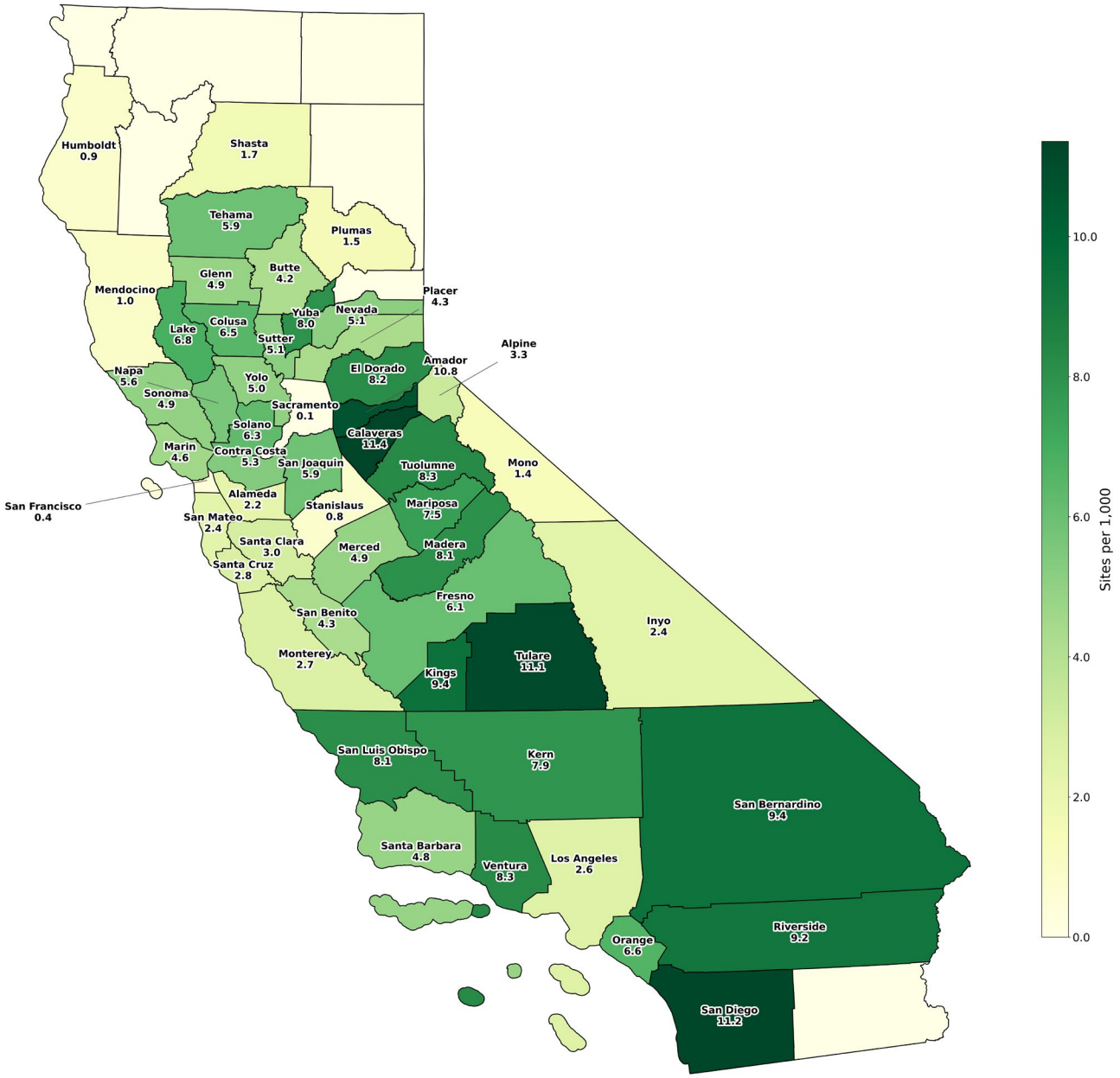
Suburban and exurban communities throughout the Inland Empire also show strong per capita uptake, with San Bernardino at 9.4 sites per 1,000 residents and Riverside at 9.2. These are communities where single-family homeowners are investing in battery storage and contributing to grid reliability—while earning incentive payments and protecting themselves against outages.

For capacity per capita (Figure 6), foothill and Central Valley counties stand out, reflecting larger system sizes on properties with more space. Calaveras leads at 109.6 kW per 1,000 residents, followed by Amador (89.7), Tuolumne (81.8), Mariposa (75.7), and Lake (75.6). San Luis Obispo also ranks high at 74.9 kW per 1,000 residents. These communities are not only participating in DSGS but are contributing outsized capacity to grid reliability relative to their populations.

**Top 10 Counties by Participation – Sites and Capacity (kW) per 1,000 Residents**

| Rank | County | Total Sites | Capacity (kW) | Sites/1,000 | kW/1,000 |
|---|---|---|---|---|---|
| #1 | Calaveras | 525 | 5,066 | 11.4 | 109.6 |
| #2 | San Diego | 37,103 | 185,031 | 11.2 | 56.1 |
| #3 | Tulare | 5,248 | 35,052 | 11.1 | 74.1 |
| #4 | Amador | 436 | 3,629 | 10.8 | 89.7 |
| #5 | Kings | 1,439 | 11,312 | 9.4 | 74.0 |
| #6 | San Bernardino | 20,507 | 118,662 | 9.4 | 54.4 |
| #7 | Riverside | 22,211 | 130,902 | 9.2 | 54.1 |
| #8 | Tuolumne | 462 | 4,564 | 8.3 | 81.8 |
| #9 | Ventura | 6,965 | 38,963 | 8.3 | 46.2 |
| #10 | El Dorado | 1,568 | 13,826 | 8.2 | 72.3 |

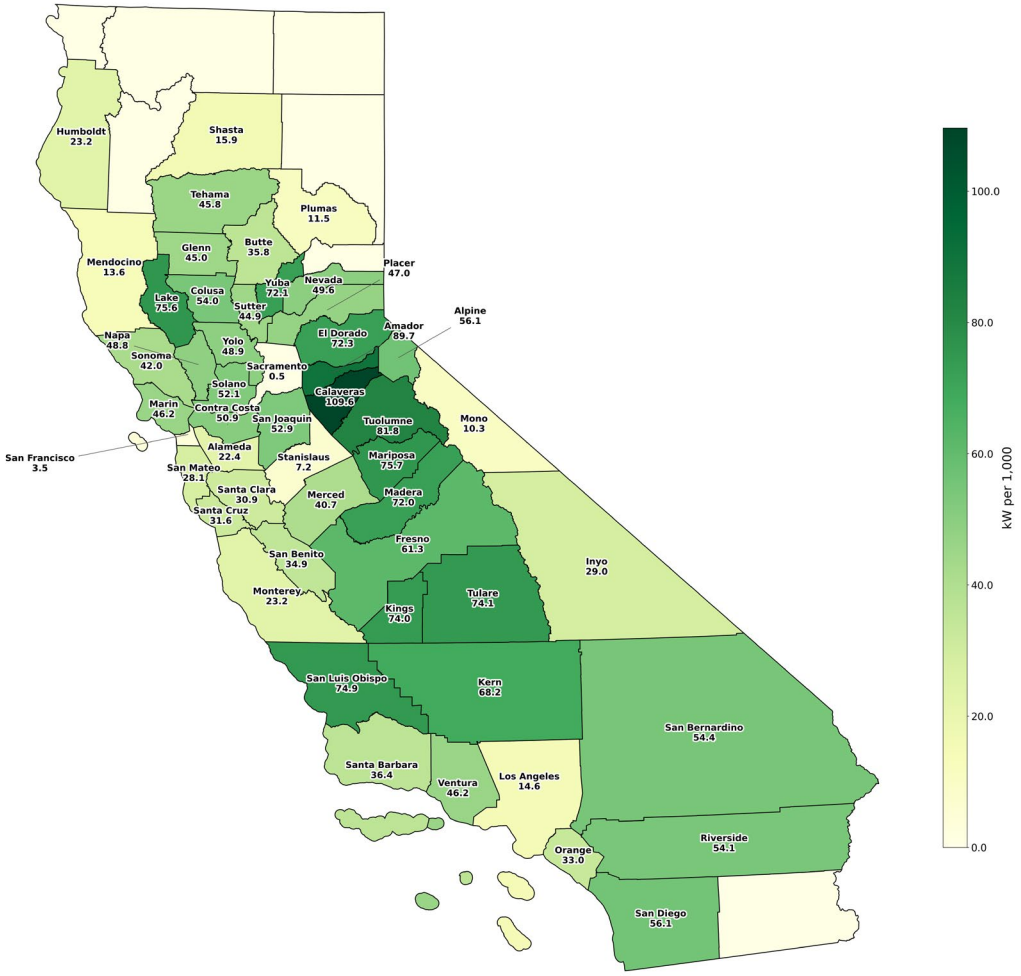
## Figure 5. DSGS Option 3 & 4 Participation by County: Sites per 1,000 Residents



**Top 10 Counties by Capacity - kW per 1,000 Residents**

| Rank | County | Total Sites | Capacity (kW) | Sites/1,000 | kW/1,000 |
|---|---|---|---|---|---|
| #1 | Calaveras | 525 | 5,066 | 11.4 | 109.6 |
| #2 | Amador | 436 | 3,629 | 10.8 | 89.7 |
| #3 | Tuolumne | 462 | 4,564 | 8.3 | 81.8 |
| #4 | Mariposa | 129 | 1,297 | 7.5 | 75.7 |
| #5 | Lake | 466 | 5,152 | 6.8 | 75.6 |
| #6 | San Luis Obispo | 2,298 | 21,139 | 8.1 | 74.9 |
| #7 | Tulare | 5,248 | 35,052 | 11.1 | 74.1 |
| #8 | Kings | 1,439 | 11,312 | 9.4 | 74.0 |
| #9 | El Dorado | 1,568 | 13,826 | 8.2 | 72.3 |
| #10 | Yuba | 653 | 5,877 | 8.0 | 72.1 |

**Figure 6. DSGS Option 3 & 4 Participation by County: Capacity (kW) per 1,000 Residents**



# 3. INCOME & EQUITY ANALYSIS

A common criticism of distributed energy programs is that they could primarily benefit affluent homeowners. Empirically, this is changing over time, with growing low-to-moderate income (LMI) participation across the country. To estimate the income level of participants in DSGS, this analysis cross-references county-level program participation data with county-level income estimates from the Lawrence Berkeley National Laboratory (LBNL) Residential Solar-Adopter Income and Demographic Trends report (2024 Update).[2] The LBNL dataset provides median household income, area median income (AMI) ratios, and income distribution breakdowns for solar adopters in 49 California counties, covering more than 261,000 systems installed in 2023. Since DSGS participation data is from 2025, and solar, battery and smart-thermostat adoption is rapidly moving towards lower-income customers, this provides a conservative estimate.

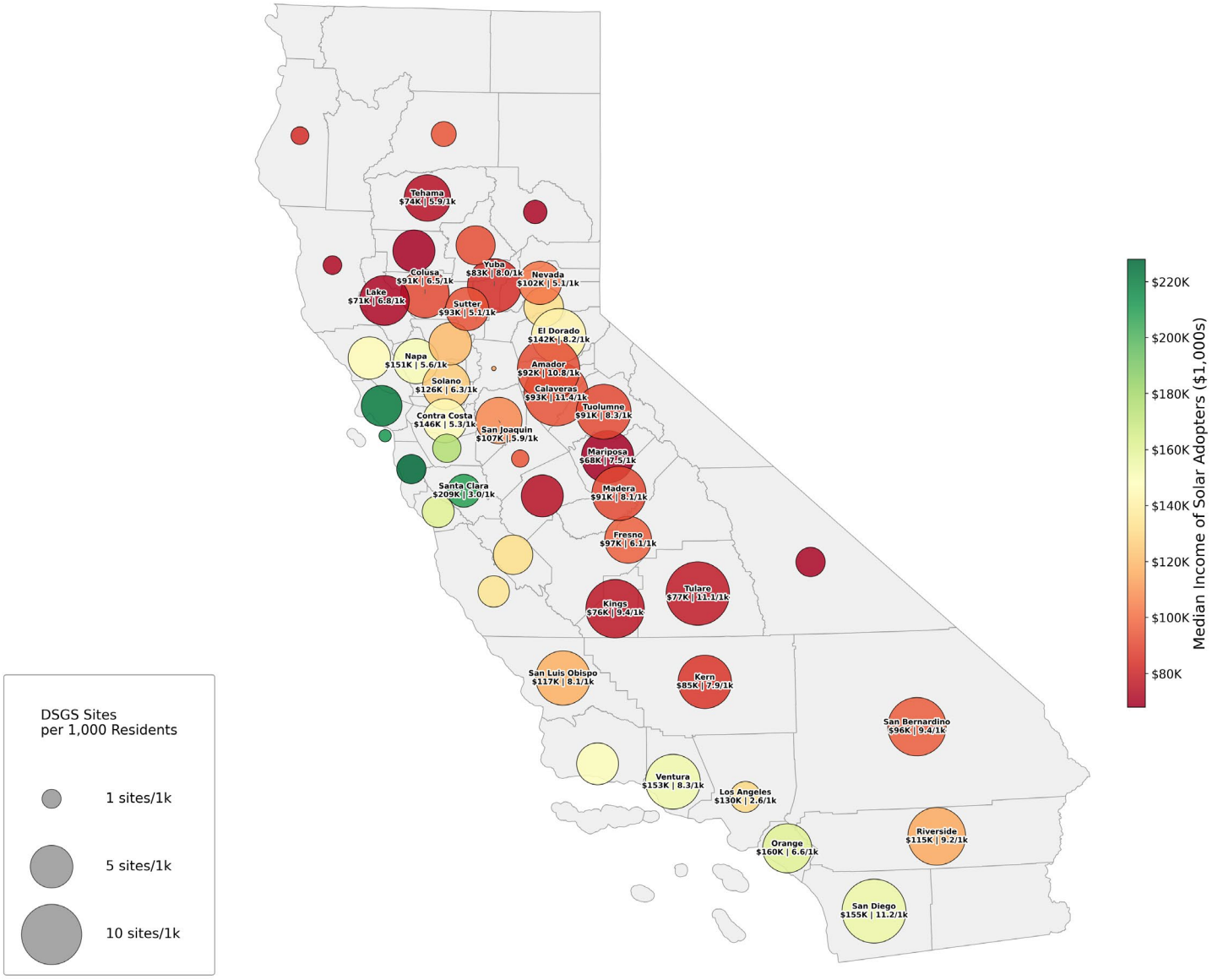
Across California, the weighted median income of solar adopters in 2023 was approximately $132,000—higher than the statewide median for all households but consistent with the fact that rooftop solar is more common on owner-occupied single-family homes. Importantly, nearly half (46.5%) of California solar adopters qualify as low-to-moderate income (LMI), defined as earning below 120% of their area median income. One in four (24.6%) qualify as low-income, earning below 80% of AMI. These figures are consistent with LBNL's national finding that solar adoption has been steadily shifting toward less affluent households, with the median income of new adopters falling from $141,000 in 2010 to $115,000 in 2023.

**The most striking finding is that DSGS per capita participation rates are actually strongest in counties where solar adopters have lower incomes.** As shown in Figure 7 and Figure 8, counties in the lowest income quintile average 7.7 DSGS sites per 1,000 residents—the highest rate of any quintile. In other words, the communities where solar customers tend to earn less are the same communities where DSGS participation is most widespread. This pattern holds across the Central Valley and Inland Empire, where counties like Tulare (median solar adopter income: $77,000; 11.1 DSGS sites per 1,000 residents), Kings ($76,000; 9.4 per 1,000), and Kern ($85,000; 7.9 per 1,000) rank among the highest-participation counties in the state. Figures 7 and 8, below, label counties with above-median per capita participation rates or at least 5,000 total enrolled sites; all counties with participation are plotted.

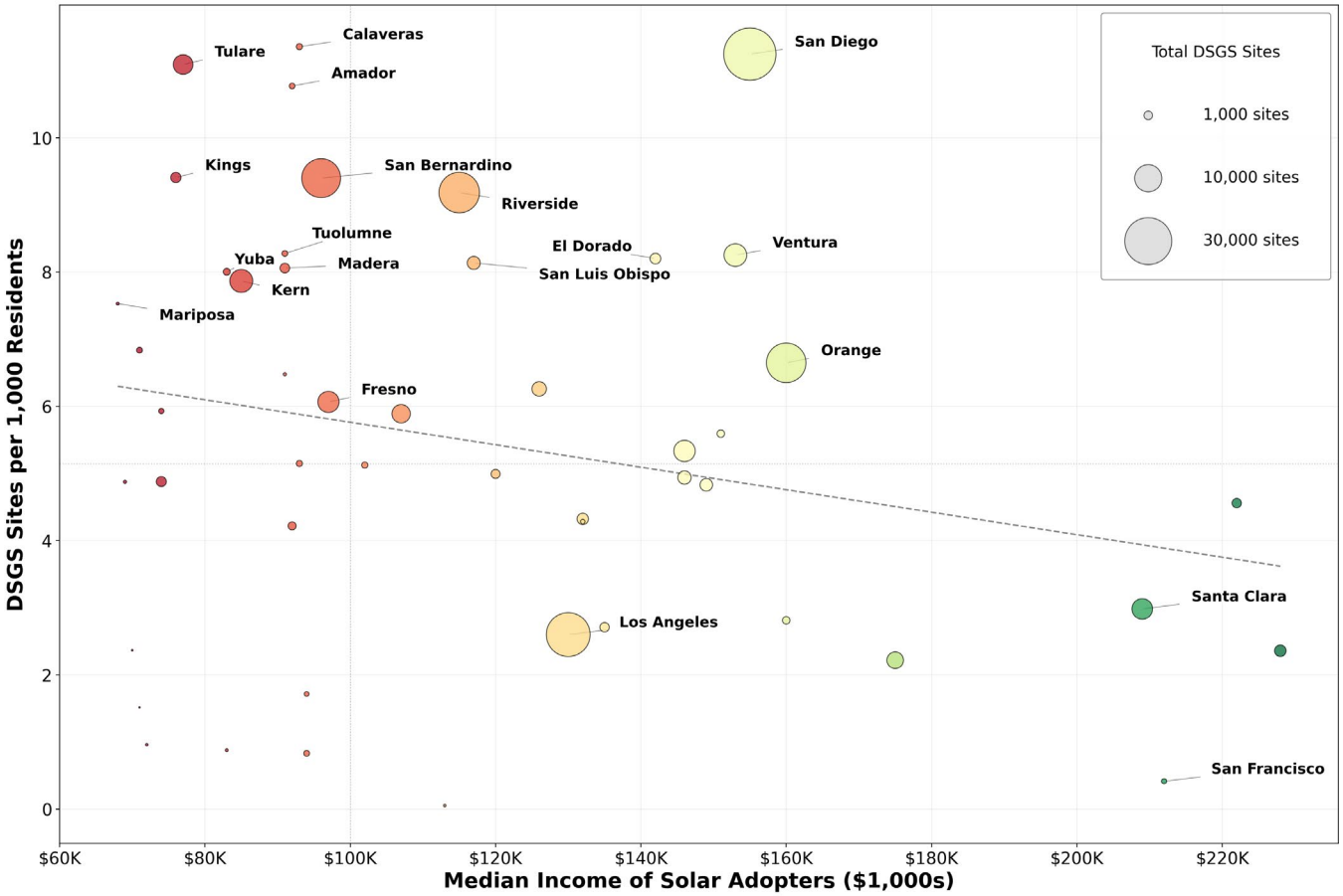
**Overall, one in four DSGS enrolled sites—nearly 49,000—are located in counties where the median income of solar adopters falls below $100,000.** These include San Bernardino County ($96,000 median; 20,507 DSGS sites), Kern County ($85,000; 7,154 sites), Fresno County ($97,000; 6,119 sites), and Tulare County ($77,000; 5,248 sites). Similarly, one in four DSGS sites are in counties where more than half of all solar adopters are LMI, including Los Angeles County (51% LMI; 26,044 sites) and Kern County (51% LMI). These data challenge the narrative that distributed energy programs like DSGS primarily benefit the wealthy. DSGS is reaching working- and middle-class communities across California—particularly in the Central Valley and Inland Empire—and these communities are participating at rates equal to or greater than wealthier coastal areas. Continuing to fund and expand DSGS would deepen these equity benefits while strengthening grid reliability for all Californians.

2 Elmallah, S., Forrester, S., Barbose, G., O'Shaughnessy, E., and Wiser, R. Residential Solar-Adopter Income and Demographic Trends: 2024 Update. Lawrence Berkeley National Laboratory. December 2024. County-level data accessed via the LBNL Solar-Adopter Income Trends Data Visualization Tool (https://emp.lbl.gov/solar-demographics-tool).

## Figure 7. DSGS Participation and Solar Adopter Income by County



## Figure 8. Counties with Lower-Income Solar Adopters Have Higher DSGS Participation Rates






# CONCLUSION

The DSGS program has demonstrated that a statewide virtual power plant can scale rapidly, deliver clean reliability at low cost, and reach communities across the income spectrum. With more than 203,000 sites enrolled during the 2025 program year and over 1 GW (1,000,000 kW) of dispatchable capacity, DSGS is one of California's most successful clean energy programs. The data presented in this report show that participation spans every legislative district in the state, extends into 53 of 58 counties, and is strongest in the working- and middle-class communities of the Central Valley and Inland Empire. As California looks to retire aging fossil-fueled peaker plants and build a cleaner, more resilient grid, continued investment in DSGS would protect ratepayers, strengthen reliability, and expand equitable access to the benefits of distributed energy resources.

