



Renewable Energy – Overview

Advancing renewable energy is critical to the state's ambitious climate change efforts. The state is working to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030 – this GHG reduction requirement was established by Governor Edmund G. Brown Jr. through Executive Order B-30-15 and then codified into state law by Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016). The companion bill, Assembly Bill 197 (Garcia, Chapter 250, Statutes of 2016) makes the state's implementation of its climate change policies transparent and equitable, with the benefits reaching disadvantaged communities. As part of his vision to reduce greenhouse gas emissions, the Governor called for California to increase to 50 percent the electricity derived from renewable energy sources by 2030,¹ an action codified into law as a requirement by the Clean Energy and Pollution Reduction Act of 2015 (Senate Bill 350, De León, Chapter 547, Statutes of 2015).

To help support the state's renewable energy goals and policies, the California Energy Commission regularly updates the state's progress toward California's renewable energy goals, including updates on the state's Renewables Portfolio Standard (RPS), the amount of renewable capacity installed in-state, planned renewable energy projects, and advancements in transmission planning.

Renewables Portfolio Standard Targets

Established in 2002, California's RPS is one of the most ambitious renewable energy policies in the nation. Enacted by Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002) with bipartisan support, and accelerated and expanded by subsequent legislation, California's RPS establishes increasingly progressive renewable energy procurement targets for the state's load-serving entities, requiring both retail sellers and local publicly owned electric utilities to increase their procurement of eligible renewable energy resources to 33 percent of retail sales by 2020 and 50 percent by 2030.

California is ahead of schedule for meeting its renewable energy targets. The Energy Commission estimates that about 29 percent of its electricity retail sales in 2016 were served by renewable energy generated from sources such as wind, solar, geothermal, biomass, and small hydroelectric, as shown in **Figure 1**. This is an increase from the previously reported estimate that renewable energy comprised 27 percent of California's electricity mix in 2016, as reported in the December 2016 Tracking Progress for renewable energy. The previous finding was based in part on estimates while this update is based on more complete data.

This is a proxy for California's RPS status as it approximates generation from RPS-eligible sources divided by retail sales.^{2, 3, 4} This estimate does not reflect the RPS accounting rules that allow for,

1 Governor Brown's 2015 inaugural address, January 5, 2015, <https://www.gov.ca.gov/news.php?id=18828>.

2 The renewables procurement percentage estimate does not represent verified eligible RPS procurements and thus is not an official determination of RPS compliance or progress. Staff estimated 2016 renewable energy generation totaled 73,900 gigawatt-hours (GWh) using data from the Energy Commission's Total System Power, Power Source Disclosure Program and Wind Performance Reporting System, which captures in-state renewable energy generation assumed to have been purchased from California load-serving entities and 2016 out-of-state renewable energy procurement. Staff estimated an adjusted statewide 2016 retail sales (255,000 GWh) using the *California Energy Demand Updated Forecast 2017-2027* mid case, less excluded entities, pumping loads, and mid-additional achievable energy efficiency values.

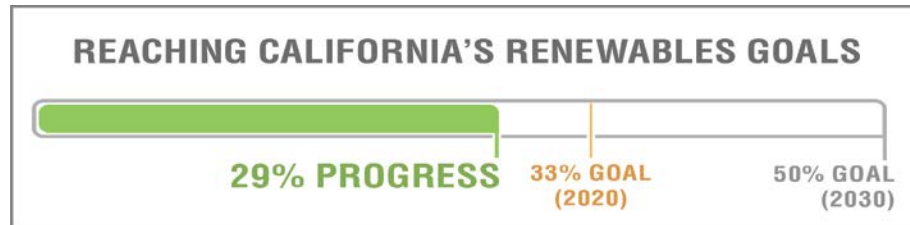
3 With a few exceptions noted in the *RPS Eligibility Guidebook*, large hydroelectric facilities greater than 30 megawatts (MW) are not eligible for California's RPS. Estimates reported here of total generation and renewable energy capacity do not include



California Energy Commission – Tracking Progress

among other things, carryover between multiyear compliance periods. For more information, see the section below on “Percentage Renewable Is a Proxy for RPS Progress.”

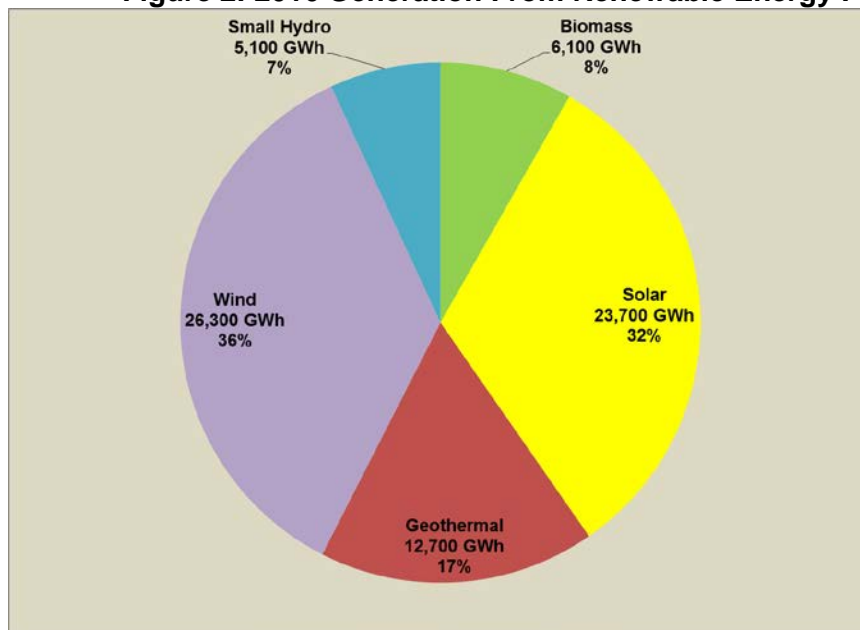
Figure 1: Progress to Meeting California’s Renewable Energy Goals



Source: California Energy Commission staff, June 2017.

Figure 2 shows the estimated 2016 generation of renewable energy facilities serving California by fuel type.

Figure 2: 2016 Generation From Renewable Energy Facilities Serving California



2016 Adjusted Retail Sales: 255,000 GWh

2016 Estimated Renewable Energy Generation: 73,900 GWh

Source: California Energy Commission staff. Data sources include Quarterly Fuels and Energy Report [8], 2015 Power Source Disclosure Filings [11], S-2 Filings [D2], CPUC compliance filings [12], and Energy Commission RPS Compliance Filings [13]. Updated June 2017.

Renewable Capacity in California

California’s operating renewable energy capacity⁵ is composed of facilities both within and outside the state. The Energy Commission collects data from power plants with a total nameplate capacity of 1 megawatt (MW) or more that are within California or physically located outside California with a first point of interconnection into California.

large hydroelectric facilities as they are not eligible for California’s RPS. In contrast, Germany and the U.S. Energy Information Agency account for large hydroelectric generation as a renewable resource. Roughly 10 to 15 percent of California’s energy generation is from large hydroelectric generation that is not RPS-eligible. (Low end reflects drought years.)

4 Electricity generated from self-generation capacity such as rooftop solar is not included in the estimate of renewable energy generation, although it does lower retail sales of electricity.

5 *Capacity* refers to the maximum electric output a generator can produce under specific conditions, while *generation* refers to the amount of electricity a generator actually produces over a specific period. Unless otherwise noted, capacity figures in this document refer to *nameplate capacity*, which is the maximum output a generator can produce without exceeding design limits.

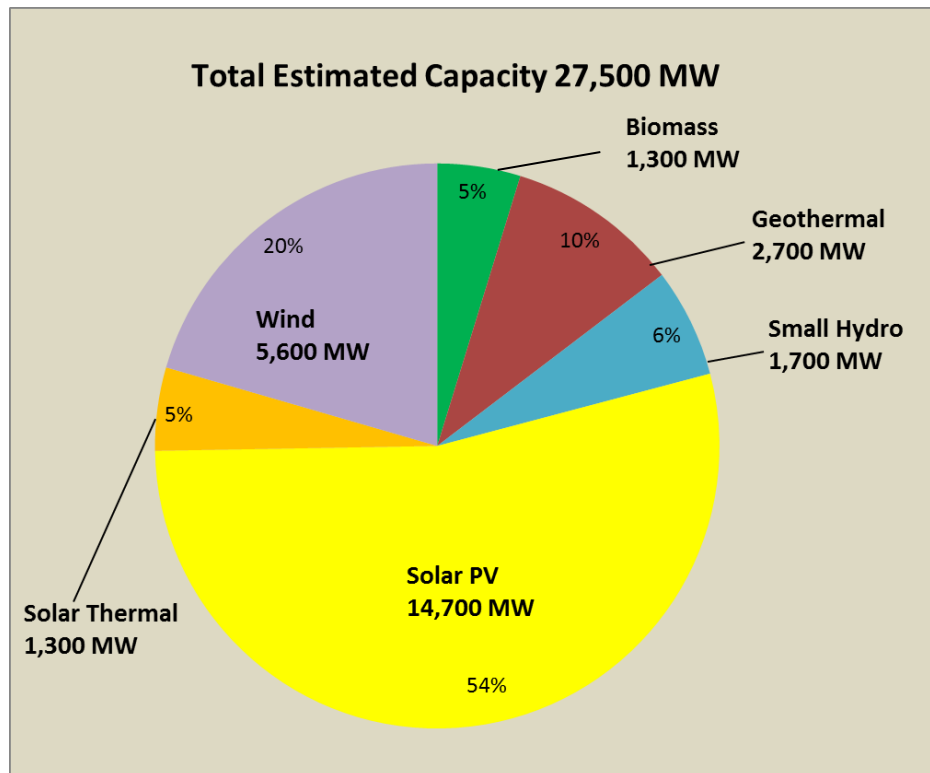


California Energy Commission – Tracking Progress

California's in-state operating renewable energy capacity was 27,500 MW as of June 19, 2017.⁶ The total includes a little more than 6,000 MW of self-generation capacity,⁷ 5,800 MW of which is self-generation solar photovoltaic (PV).

Figure 3 shows the mix of in-state renewable resources by fuel type in terms of capacity, including self-generation.

Figure 3: In-State Renewable Capacity by Resource Type, Includes Self-Generation (as of June 2017)



Source: California Energy Commission staff. Data sources: Quarterly Fuel and Energy Report [8], Renewable Distributed Generation sources [D1]-[D14], Data include only facilities physically located in California; however, there are some instances where in-state facilities have contracted to sell power outside California. The entire nameplate capacity of these facilities is included in the capacity total for Figure 3. See notes for Table 1 for additional information about the data. Not included in Figure 4 are 2,127 MW of renewable energy facilities that are physically out-of-state but have the first point of interconnection in California. Totals may not sum due to rounding. Also not included in the pie chart are 201 MW of self-generation for which the fuel type is undefined. The 201 MW are included in the 27,500 MW of total estimated capacity. Updated June 2017.

Governor's Goals for Adding Renewable Capacity in California

Entering his 2011 term, Governor Brown set clean energy goals as part of a plan to help rebuild California's economy.⁸ He set an overall goal of adding 20,000 MW of renewable generation in California by 2020, composed of 8,000 MW of large-scale renewable generation and 12,000 MW of renewable distributed generation. California has well exceeded the 8,000 MW goal for large-scale renewables with 10,500 MW added since January 2011, for a total of 17,124 MW. The state is also expected to meet the 12,000 MW goal for distributed generation by 2020.

⁶ Overlap may exist between the self-generation projects reported in Table 5 and non-self-generation projects reported in Table 1 of about 190 MW. When providing the total statewide capacity, 27,500 MW, staff added the wholesale capacity in Table 1 (21,700 MW) and the total self-generation capacity reported (6,000 MW), and netted out the 190 MW of potential overlap to avoid double-counting.

⁷ *Self-generation* is defined as distributed energy systems installed on the customer side of the utility meter. These systems serve on-site load or export power back to the grid through net-energy metering.

⁸ *Clean Energy Jobs Plan*, https://www.gov.ca.gov/docs/Clean_Energy_Plan.pdf.



California Energy Commission – Tracking Progress

Renewable Distributed Generation

Figure 4 (on the next page) shows progress toward the goal of installing 12,000 MW of renewable distributed generation in California by 2020. *Distributed generation* is defined here as projects that are 20 MW or smaller – including both self-generation and projects that generate energy for the market.

As of June 30, 2017, almost 10,400 MW of distributed generation capacity was operating or installed in California, with an additional 500 MW pending.⁹ The data include about 5,800 MW of solar self-generation capacity, which far exceeds the state's goal established through the California Solar Initiative of installing 3,000 MW of solar energy residential and commercial sites by the end of 2016.

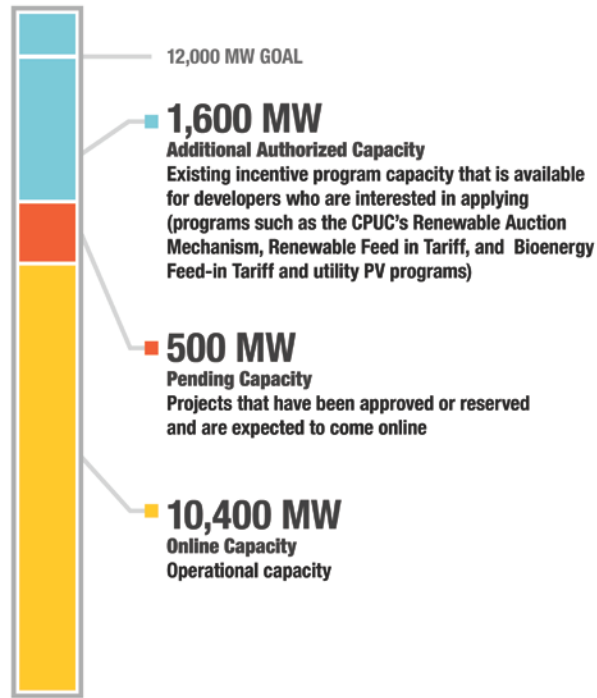
California's programs to support renewable distributed generation could add another 1,600 MW if fully subscribed. Past and current renewable distributed generation incentive programs include utility feed-in tariffs along with state-mandated self-generation incentives such as the Self-Generation Incentive Program, the California Solar Initiative, publicly owned electric utility (POU) solar programs, and the Emerging Renewables Program. Assuming all pending and additional authorized capacity under these programs is successfully installed, California is on a trajectory to exceed the 12,000 MW goal by 2020.

⁹ Pending projects include projects either with incentive funding reserved from a self-generation incentive program or with a power purchase agreement.



California Energy Commission – Tracking Progress

Figure 4: Renewable Distributed Generation in California (20 MW or Smaller, Includes Self-Generation)

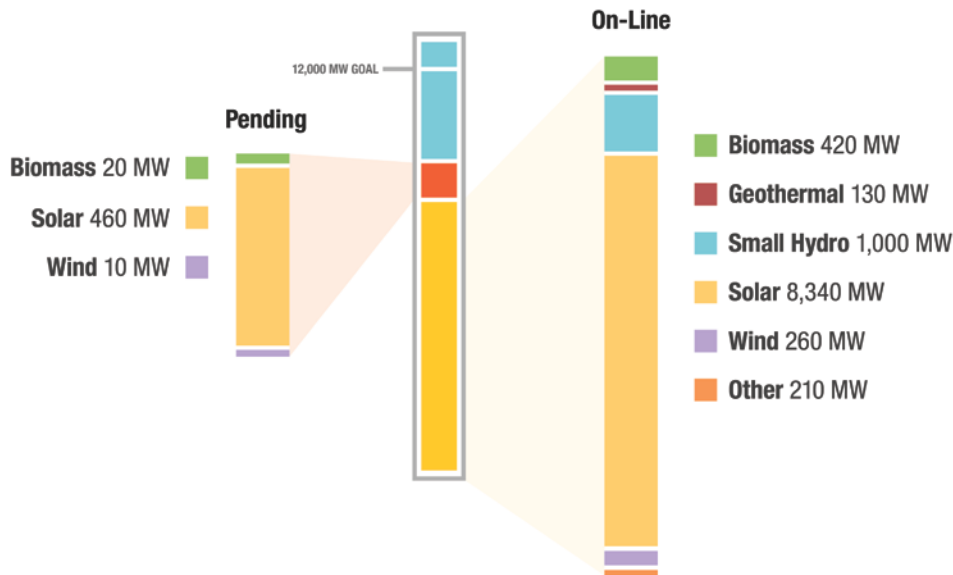


Source: California Energy Commission staff. Data sources: [D1] through [D14]. Data updated June, 2017. Also includes net-energy metering (NEM) projects that have not received California renewable energy incentives [D14].

Source: California Energy Commission staff. Updated June 2017.

Figure 5 shows the data in Figure 4 by fuel type.

Figure 5: Renewable Distributed Generation in California by Fuel Type (20 MW or Smaller, Includes Self-Generation)



Source: California Energy Commission staff. Data sources: [D1] through [D14]. Data updated June, 2017. Also includes net-energy metering (NEM) projects that have not received California renewable energy incentives [D14].

Source: California Energy Commission staff. Updated June 2017.



Renewable Energy – Additional Information

Below is additional information on the topics presented above, as well as information on other issues, including the impacts of retail choice, renewable energy cost trends, and permitting and construction of new renewable energy generation in California and planning for transmission.

Renewables Portfolio Standard

The RPS establishes multiyear compliance periods in recognition of the annual variability of renewable resources, particularly from hydroelectric facilities. The RPS requires all load-serving entities (LSEs) in the state to achieve the following targets for retail electricity sales from renewable sources:

- An average of 20 percent in 2011-2013
- 25 percent by the end of 2016
- 33 percent by the end of 2020
- 40 percent by the end of 2024
- 45 percent by the end of 2027
- 50 percent by the end of 2030
- No less than 50 percent in each multiyear compliance period thereafter

In addition to meeting the RPS procurement targets, Public Utilities Code Sections 399.16 and 399.30 (c) (3) requires LSEs to procure a “balanced portfolio of eligible renewable energy resources.” To implement this requirement, LSEs must comply with the portfolio balance requirements, which set minimum and maximum levels of electricity products for specific categories of procurement.

LSEs use renewable energy credits (RECs) to meet their obligation for multiyear compliance periods. A REC represents 1 megawatt-hour of electricity generation from renewable sources. Renewable generation facilities may be located anywhere within the Western Electricity Coordinating Council (WECC) region and sell energy and/or RECs to a California LSE to meet its RPS obligation, provided the facility meets all RPS-eligibility criteria established by the Energy Commission.

Percentage Renewable Is a Proxy for RPS Progress

As discussed above and shown in **Figure 2**, Energy Commission staff estimates that in 2016 California’s electricity consumption was about 29 percent renewable as a proxy for measuring progress toward the RPS. The estimate does not reflect a compliance determination, as the RPS program includes eligibility and accounting requirements that are not fully captured in the estimate. Some of the differences between the annual accounting to estimate statewide RPS progress and the actual RPS procurement requirements used to evaluate compliance are as follows:

- Staff has taken efforts to include only RPS-eligible power plants in this analysis, but in some cases, staff may have estimated whether a project was eligible.
- Compliance with California’s RPS program is determined by the amount of RECs retired for compliance within multiyear compliance periods through 2020, which is not factored into the analysis presented here.
- RECs can be claimed for the RPS program at any point within 36 months of generation; the staff estimate for 2016 is based on 2016 generation alone.



California Energy Commission – Tracking Progress

Renewable energy percentages calculated for renewable tracking progress or total system power should not be taken as an indication of compliance with the RPS, but rather a snapshot of renewables as a percentage of retail sales for the specified year. An accurate accounting of the state's progress toward the 33 percent and 50 percent renewable mandates cannot be completed until after the close of each multiyear compliance period.

RPS Compliance for Compliance Period 1 (2011-2013)

LSEs were required to procure an average of 20 percent renewables for Compliance Period 1 (2011-2013). The Energy Commission has adopted verified eligibility results for 21 retail sellers and 42 POUs for the 2011–2013 compliance period.^{10,11} California's three largest investor-owned utilities (IOUs) collectively served 22.7 percent of their 2013 retail electricity sales with renewable power.¹² The 42 POUs with verified results procured a combined 18.6 percent for the 2011–2013 compliance period. Final RPS 2011–2013 compliance results will be determined by the CPUC for retail sellers and by the Energy Commission for POUs.

Renewable Costs Have Come Down

Continued cost declines in key renewable energy sources, mainly solar and wind energy, have helped spur market growth for renewables.

As part of the U.S. Department of Energy's (DOE's) SunShot program, the Lawrence Berkeley National Laboratory (LBNL) reported that nationally, the median installed price for utility-scale PV has steadily fallen by nearly 60 percent since the 2007–2009 period, to \$2.7/watt alternating current (W_{AC}) (or \$2.1/watt direct current [W_{DC}]) for projects completed in 2015. The median installed price in California is somewhat higher, at \$2.9/ W_{AC} .^{13, 14} As seen in **Figure 6** (on the next page), median installed system costs have declined from \$12 per watt in 2000 to under \$5 per watt in 2015.¹⁵

10 McCollough, Brian, et al. 2016. *Renewables Portfolio Standard 2011-2013 Retail Sellers Procurement Verification* Lead Commissioner Report. California Energy Commission, Renewable Energy Division. Publication Number: CEC-300-2016-004-CMF.

11 *Renewables Portfolio Standard Verification Results Lead Commissioner Reports* for POUs for Compliance Period 1 (2011-2013), adopted January 25, 2017. Verification results for Los Angeles Department of Water and Power have not yet been finalized, due to a pending appeal before the Energy Commission.

12 *California Public Utilities Commission 2015 Annual Report*.

13 PV project capacity is commonly reported in DC terms (particularly in the residential and commercial sectors). The LBNL analysis reports utility-scale solar in AC terms.

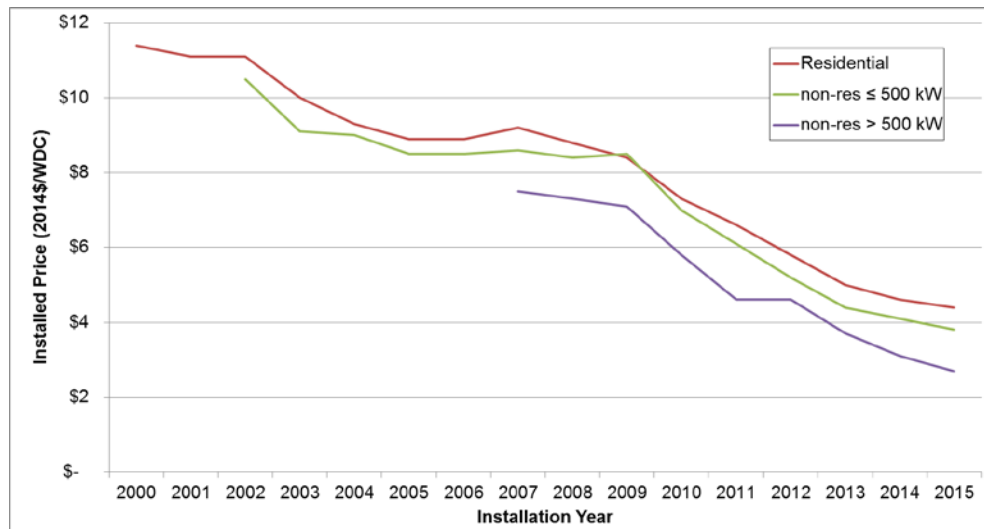
14 Bolinger, Mark and Joachim Seel, Lawrence Berkeley National Laboratory, *Utility-Scale Solar 2015: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States*, August 2016, https://emp.lbl.gov/sites/all/files/lbnl-1006037_report.pdf.

15 Barbose, Galen Naïm Darghouth, Dev Millstein, Sarah Cates, Nicholas DiSanti, and Rebecca Widiss. Lawrence Berkeley National Laboratory, August 2016. *Tracking the Sun IX: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States*.



California Energy Commission – Tracking Progress

Figure 6: Residential and Nonresidential PV System Sample and Median Installed Price



Source: Barbose, Galen, Naïm Darghouth, Dev Millstein, Sarah Cates, Nicholas DiSanti, and Rebecca Widiss. Lawrence Berkeley National Laboratory, August 2016. *Tracking the Sun IX: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States*. Table B-4.

The installed cost of wind has also decreased over time. The DOE reported that the average capacity-weighted average installed project costs was about \$1.69/watt down about 27 percent (\$0.64/watt) compared to the apparent peak in 2009 and 2010 (\$2.33/watt). Similarly, onshore wind power purchase agreement prices have dropped from a high of around \$70/MWh to an average of about \$20/MWh between 2009 and 2015.¹⁶

Renewable Generation and Capacity in California Have Grown

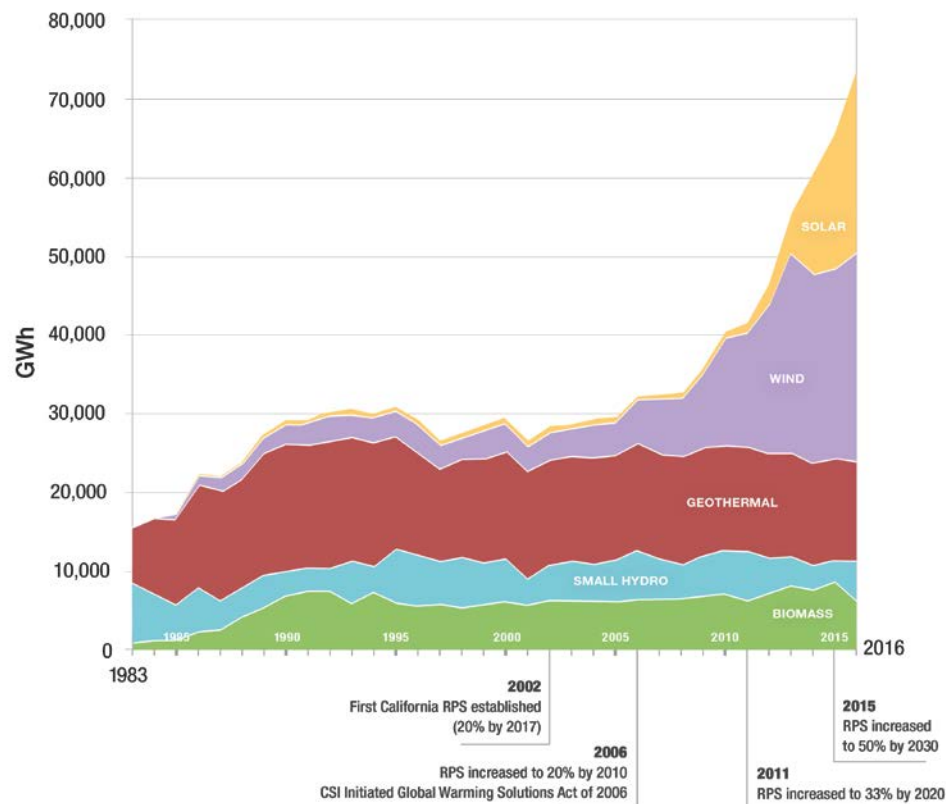
Figure 7 (on the next page) shows renewable generation procured for California from 1983–2016 by resource type and does not include self-generation such as rooftop PV. **Figure 7** also shows key policy changes in 2002, 2006, 2011, and 2015 to advance renewable development.

¹⁶ Wisner, Ryan, Bolinger, Mark, Barbose, Galen, Darghouth, Naim R., Hoen, Ben, Mills, Andrew D., Rand, Joe, Millstein, Dev, Porter, Kevin, Widiss, Rebecca, Oteri, Frank, Tegen, Suzanne, and Tian, Tian. Lawrence Berkeley National Laboratory, *Wind Technologies Market Report*, August 2016, <https://emp.lbl.gov/publications/2015-wind-technologies-market-report>. DOE reports that the average price decline in wind energy PPAs across the United States is driven largely by significant wind energy development in the interior United States, which is generally associated with relatively low wind energy PPA prices as compared to the western United States.



California Energy Commission – Tracking Progress

Figure 7: California Renewable Energy Generation by Resource Type (In-State and Out-of-State)



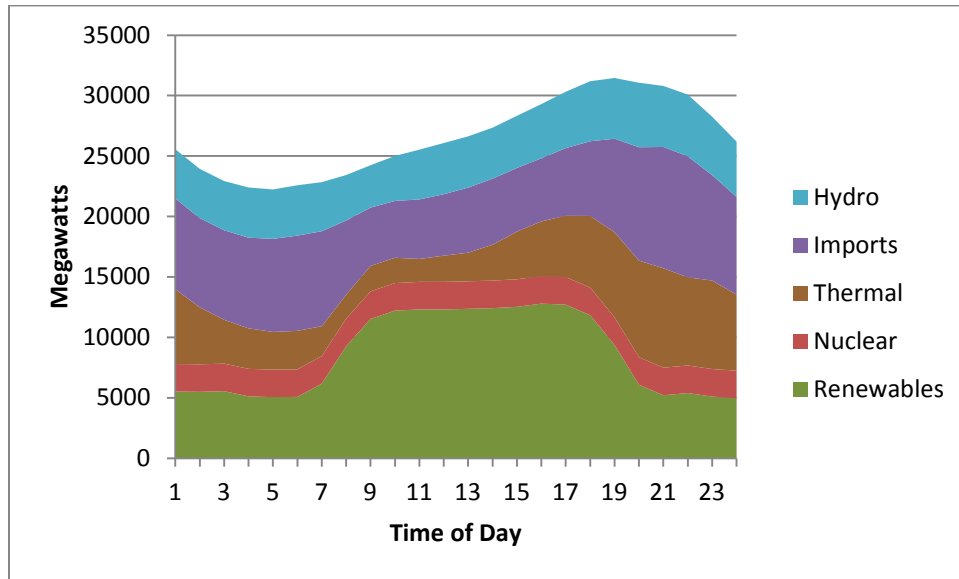
Source: California Energy Commission staff. Data sources: Quarterly Fuels and Energy Report [8], 2015 Power Source Disclosure Filings [11], S-2 Filings [D2], EIA Electric Power monthly [D15], CPUC compliance filings [12], and Energy Commission RPS Compliance Filings [13].

The growth in renewables, particularly solar generation, has created new grid operational challenges as it has dramatically changed California's generation profile. The California Independent System Operator (California ISO) publishes daily reports on the generation in its service area. **Figure 8** on the next page shows the resource profile on a summer day.



California Energy Commission – Tracking Progress

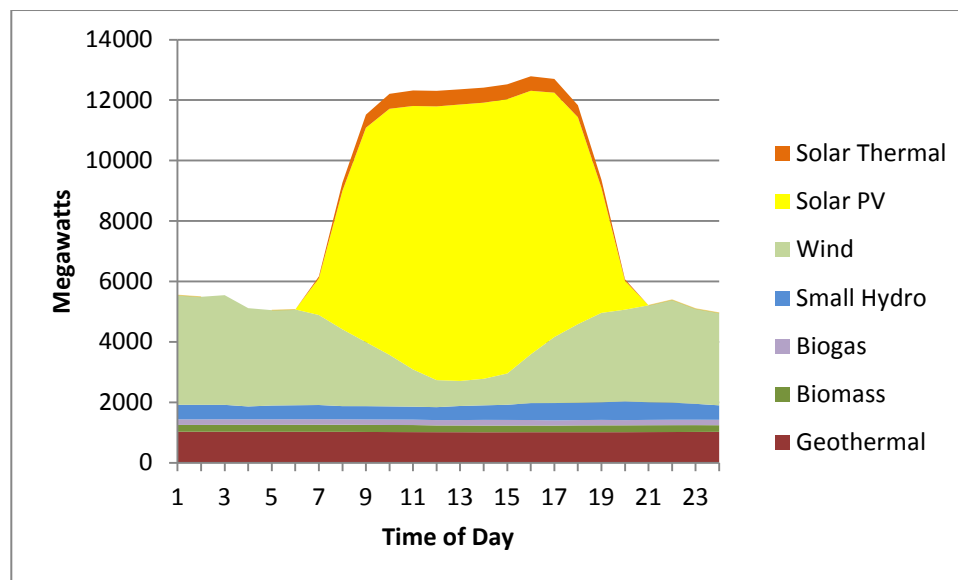
Figure 8: Hourly Average Breakdown of Total Production by Resource Type



Source: California ISO Daily Renewables watch, July 1, 2017,
http://content.caiso.com/green/renewrpt/20160701_DailyRenewablesWatch.pdf

Figure 9 shows the aggregated, or combined, renewable data from **Figure 8** by fuel type. During the day, solar dominates the renewable mix.

Figure 9: Hourly Average Breakdown of Renewable Resources



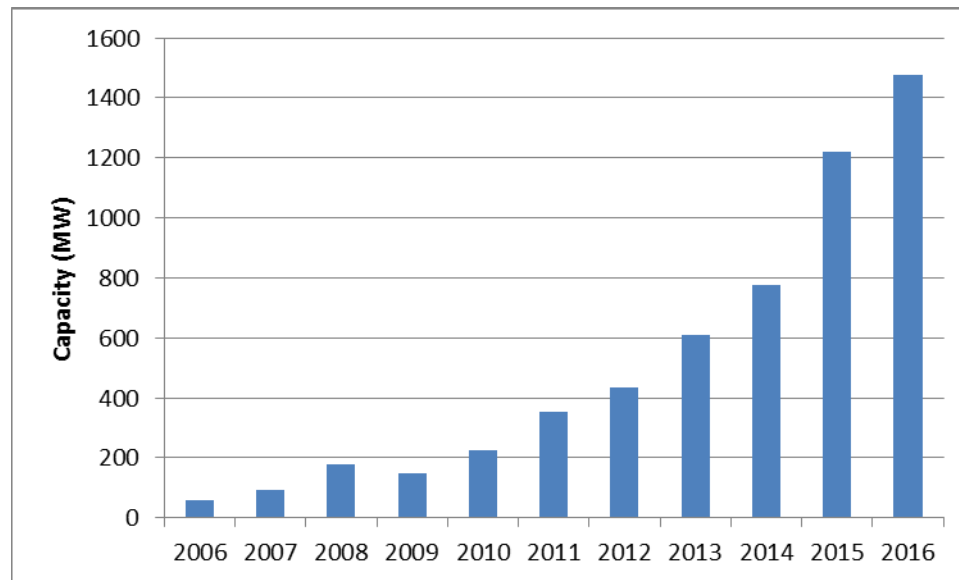
Source: California ISO Daily Renewables watch, July 1, 2017,
http://content.caiso.com/green/renewrpt/20160701_DailyRenewablesWatch.pdf



California Energy Commission – Tracking Progress

Figure 10 shows how installed capacity of self-generation has increased statewide from 2006 to 2016. The graph shows the amount of new self-generation interconnected to the electricity system annually. Of the 5,800 MW of self-generation solar installed statewide, almost 2,700 MW was installed in 2015 and 2016 alone.

Figure 10: Annual Additional Installed Self-Generation Capacity



Source: California Energy Commission staff. Sources include [D8] through [D12], [D14]. Also includes NEM projects that have not received California renewable energy incentives [D14]. Updated June, 2017.

Table 1 on the following page shows the capacity of renewable energy facilities on-line as of June 19, 2017, by county, excluding self-generation. The table provides data on the number of facilities and MW by fuel type.



California Energy Commission – Tracking Progress

Table 1: Number and Capacity of In-State Renewable Projects On-Line as of June 19, 2017

County	Biomass		Geothermal		Small Hydro		Solar PV		Solar Thermal		Wind		Total	
	Count	(MW)	Count	(MW)	Count	(MW)	Count	(MW)	Count	(MW)	Count	(MW)	Count	(MW)
Alameda	4	24					12	15			4	182	20	221
Amador	1	23			2	14	1	2					4	38
Butte	1	2			9	69	9	10					19	81
Calaveras					7	32	1	2					8	33
Colusa	1	29											1	29
Contra Costa	2	7					11	31			1	38	14	76
El Dorado					8	69							8	69
Fresno	2	56			2	35	42	597					46	688
Glenn					1	5	2	3					3	8
Humboldt	3	61			2	2							5	63
Imperial			20	718	8	93	14	1,048			1	265	43	2,123
Inyo			3	302	13	156	2	6					18	464
Kern	3	124			5	75	89	2,459			50	3,282	147	5,940
Kings							22	466					22	466
Lake			5	396	2	6	3	3					10	404
Lassen	1	36			1	30							2	65
Los Angeles	13	214			21	216	141	940					175	1,370
Madera	2	38			7	61	4	25					13	123
Marin	1	0					2	3					3	3
Mariposa					1	9							1	9
Mendocino					4	13	4	7					8	20
Merced	2	13			5	33	12	140			1	18	20	204
Mono			3	40	3	21							6	61
Monterey	3	8					7	9			2	2	12	19
Napa	1	1					2	2					3	3
Nevada					10	81							10	81
Orange	6	85			3	12	1	3					10	100
Placer	3	52			11	92	4	6					18	149
Plumas	2	40			4	28							6	67
Riverside	2	55			7	51	30	1,131	1	250	32	659	72	2,146
Sacramento	1	9			1	14	37	122					39	145
San Benito							3	4					3	4
San Bernardino	1	3			11	38	84	617	11	999	3	7	110	1,663
San Diego	12	44			4	13	26	133			2	51	44	241
San Francisco	1	2					8	14					9	17
San Joaquin	5	82			1	11	6	10			2	4	14	106
San Luis Obispo	2	3			1	4	14	812					17	819
San Mateo	1	11											1	11
Santa Barbara	3	7											3	7
Santa Clara	2	3			1	0	21	30					24	33
Santa Cruz	2	5					2	3					4	7
Shasta	4	144			26	89	5	8			1	101	36	342
Sierra					4	14							4	14
Siskiyou	1	13			5	72							6	86
Solano	2	10					14	18			13	1,035	29	1,063
Sonoma	4	13	12	1,238	1	3	12	14					29	1,268
Stanislaus	2	26			6	21	4	48					12	95
Sutter							4	4					4	4
Tehama					4	22	10	9			1	1	15	32
Trinity					6	10							6	10
Tulare	2	14			7	38	30	297					39	349
Tuolumne	2	33			8	193	1	2					11	228
Ventura	3	5			3	3	2	4					8	12
Yolo	2	31			1	12	7	10			1	1	11	54
Yuba	1	3			3	1	1	1					5	5
Total	106	1,328	43	2,694	229	1,757	706	9,063	12	1,249	114	5,647	1,210	21,700



California Energy Commission – Tracking Progress

Notes on Table 1: Summary of In-State Renewable Projects On-Line as of June 19, 2017.

This table represents wholesale suppliers of electricity from energy sources considered eligible for California's RPS. It does not include residential self-generation. Totals may not sum due to rounding.

Sources: California Energy Commission Quarterly Fuels and Energy Report [8]. QFER collects data 45 days after each calendar quarter for power plants 10 MW and larger and annually for plants from 1-10 MW. Plants under 1 MW are not required to report under QFER. The counts are for facilities on-line as of June 19, 2017. CPUC RPS contract database [D1], POU S-2 and S-5 Forms for 2014 [D2], and California ISO facility interconnection [D 14].

1. "Biomass" does not include generation by natural gas plants using out-of-state landfill and digester gas transported through the natural gas pipeline. Please check the RPS online database for the most up-to-date listings of RPS-certified power plants.
2. The "Small Hydro" category includes all RPS-eligible hydroelectric facilities that are rated from 1 MW to 30 MW. It also includes a few larger facilities that may qualify for a load-serving entity's RPS program. Please check the RPS online database for the most up-to-date listings of RPS-certified power plants.
3. "Solar PV" does not include PV installed under a net metering agreement such as residential rooftop solar. Data represent on-line capacity from operating plants. Some projects are developed in multiple phases, and the final project may have a larger capacity.
4. There may be some overlap between the self-generation projects reported in Table 5 and non-self-generation projects reported here of about 190 MW.

Data in **Table 1** include 290 MW of new renewable capacity that began operating in 2017 as of June 19, 2017. The data in **Table 1** include only facilities physically located in California. **Table 2** shows that an additional 2,130 MW may be accounted for from facilities physically located out-of-state that have the first point of interconnection with a California balancing authority and are considered in-state resources for the RPS.¹⁷ (These data are not included in **Table 1** or **Figure 3**.)

Table 2: Renewable Facilities Located Out-of-State With First Point of Interconnection in California

Facility and State	Technology	Capacity (MW)
Agua Caliente Solar (AZ)	Solar	243
Arlington Valley Solar Energy II (AZ)	Solar	129
Copper Mountain I (NV)	Solar	58
Copper Mountain II (NV)	Solar	95
Copper Mountain III (NV)	Solar	255
Copper Mountain IV (NV)	Solar	94
Juarez Wind (Baja)	Wind	155
Mesquite Solar 1 (AZ)	Solar	165
Mesquite Solar 2 (AZ)	Solar	165
Mesquite Solar 3 (AZ)	Solar	152
Milford Wind 1 (UT)	Wind	204
Milford Wind 2 (UT)	Wind	101
Silver State Power South (NV)	Solar	250
Terra-Gen Dixie Valley (NV)	Geothermal	61
Total		2,127

Source: California Energy Commission staff. Totals may not sum due to rounding. Updated June 2017.

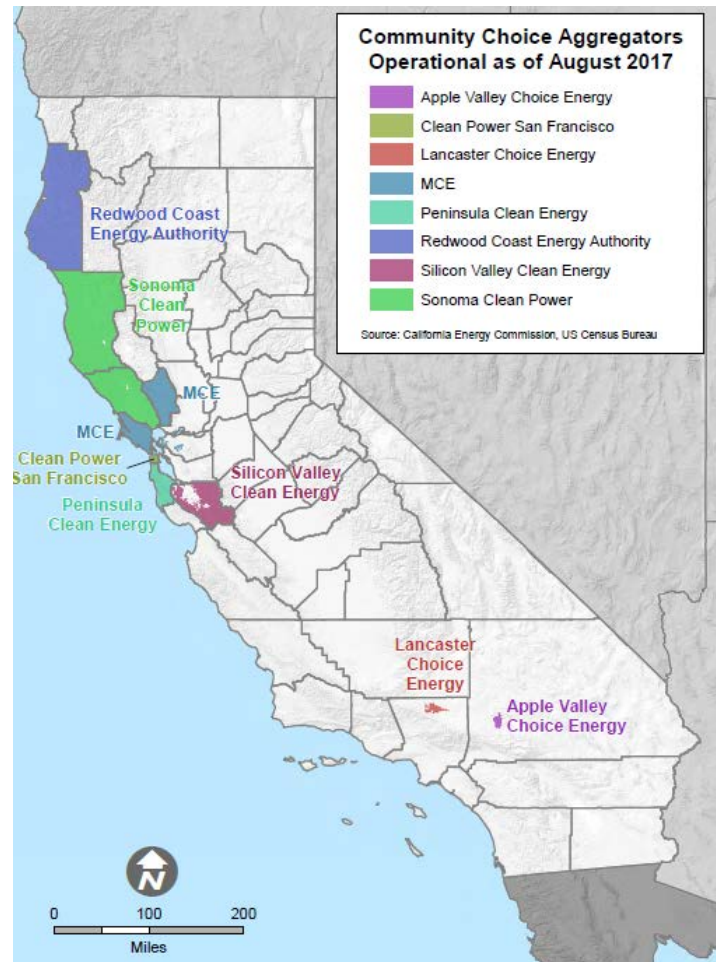
¹⁷ A *balancing authority* maintains the electricity balance between supply and demand within its region. "California balancing authority" refers to a balancing authority located primarily in California with more than 50 percent of its end-use electric load physically located within the political boundaries of California. This includes balancing authority areas operated by the California Independent System Operator Corporation, Los Angeles Department of Water and Power, Balancing Authority of Northern California, Imperial Irrigation District, and Turlock Irrigation District. It does not include the Sierra Pacific Power Company (serving primarily Nevada), PacifiCorp West, and the Bonneville Power Administration-Transmission balancing authorities serving the Pacific Northwest.

Increased Retail Choice and the Changing Electricity Market

Following the 2001-2002 California energy crisis and the subsequent rollback of retail electricity choice, the vast majority of Californians have received bundled electricity service from regulated utilities. In recent years, however, this landscape has begun to shift, largely due to the increase in self-generation and the rise of community choice aggregators (CCAs), which are local government agencies created by city or county ordinance that can directly develop and buy electricity on behalf of their customers.

At the beginning of 2017, five CCAs were operating in California and collectively serving 915,000 customers: MCE, Sonoma Clean Power, Clean Power SF, Lancaster Choice Energy, and Peninsula Clean Energy.¹⁸ By July, three more CCAs – Silicon Valley Clean Energy, Apple Valley Choice Energy, and Redwood Coast Energy Authority – began serving customers; the CPUC anticipates another CCA is soon to be operational, and an additional 11 CCAs are prospective or under exploration. Recent estimates predict that as much as 25 percent of IOU retail electric load could be unbundled by the end of 2017 by CCAs, self-generation, and electric service providers; this number could reach 85 percent in the next decade, or as many as 15 million-20 million customers.¹⁹

Figure 11: Community Choice Aggregator Jurisdictions



Progress Toward 12,000 MW Distributed Generation

Figure 3 in the *Overview* shows progress toward the Governor’s goal of 12,000 MW of renewable distributed generation by 2020. Through June 30, 2017, almost 10,400 MW of renewable distributed generation projects were operating in California, including 6,000 MW of self-generation. **Table 3** (on the next page) summarizes on-line and pending renewable distributed generation by fuel type.

¹⁸ *Consumer and Retail Choice, the Role of the Utility, and an Evolving Regulatory Framework*. 2017. California Public Utilities Commission. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Retail%20Choice%20White%20Paper%205%208%2017.pdf

¹⁹ Ibid.



**Table 3: Renewable Distributed Generation Resources, On-Line, and Pending Projects
(20 MW or Smaller, Includes Self-Generation, as of June 30, 2017)**

Resource	On-Line (MW)	Pending (MW)	Total (MW)
Biomass	420	19	439
Geothermal	129	0	129
Small Hydro	1,000	3	1,003
Solar	8,336	463	8,799
Wind	260	9	269
Other	210	0	210
Total	10,360	490	10,850

Source: California Energy Commission staff. Data sources [D1] through [D14]. Also includes NEM projects that have not received California renewable energy incentives [D14]. The table includes 0.167 MW of hybrid wind/ wind solar projects that are counted in solar. "Other" is a mix of wind, advanced energy storage, or hydro. Further, the "other" category includes any fuel cell, internal combustion engine, combustion turbine, microturbine, steam turbine, or "other" projects that take service under one of the following specific interconnection programs and are therefore considered renewable: Standard NEM, RES_BCT, Expanded NEM, and NEMBIO. If fuel cell, internal combustion engine, combustion turbine, microturbine, steam turbine, or "other" projects did not start service under those specific interconnection programs, they are not considered renewable. "Other" data were combined to protect the confidentiality of these projects. Totals may not sum due to rounding. Updated June 2017.

Table 4 (on the next page) shows the breakdown of data used in **Figure 4** and **Table 3** by California county. **Table 4** includes only projects that are 20 MW or less from **Table 1**.



California Energy Commission – Tracking Progress

**Table 4: Capacity of On-Line and Pending Distributed Generation Systems by County
(20 MW or Smaller, Includes Self-Generation, as of June 30, 2017)**

County	On-Line Capacity (MW)	Pending Capacity (MW)	County	On-Line Capacity (MW)	Pending Capacity (MW)
Alameda	249	5	Riverside	678	38
Amador	23	0	Sacramento	166	0
Butte	158	3	San Benito	14	0
Calaveras	21	0	San Bernardino	671	68
Colusa	25	0	San Diego	884	38
Contra Costa	244	1	San Francisco	52	10
El Dorado	91	5	San Joaquin	179	4
Fresno	597	65	San Luis Obispo	76	4
Glenn	26	9	San Mateo	81	1
Humboldt	38	0	Santa Barbara	53	3
Imperial	229	20	Santa Clara	285	6
Inyo	53	0	Santa Cruz	44	3
Kern	968	28	Shasta	140	2
Kings	329	9	Sierra	14	0
Lake	19	0	Siskiyou	59	0
Lassen	2	0	Solano	121	1
Los Angeles	1128	77	Sonoma	135	5
Madera	121	9	Stanislaus	72	1
Marin	41	0	Sutter	37	0
Mariposa	12	0	Tehama	49	0
Mendocino	32	0	Trinity	10	0
Merced	139	0	Tulare	448	33
Mono	64	0	Tuolumne	58	0
Monterey	76	8	Ventura	119	7
Napa	48	0	Yolo	104	4
Nevada	69	0	Yuba	26	0
Orange	369	21	Unknown	398	0
Placer	194	6			
Plumas	19	0	Total Capacity	10,355	494

Sources: California Energy Commission staff. Data sources [D1] through [D14]. Also includes NEM projects that have not received California renewable energy incentives [D14]. Updated June 30, 2017. Totals may not sum due rounding.

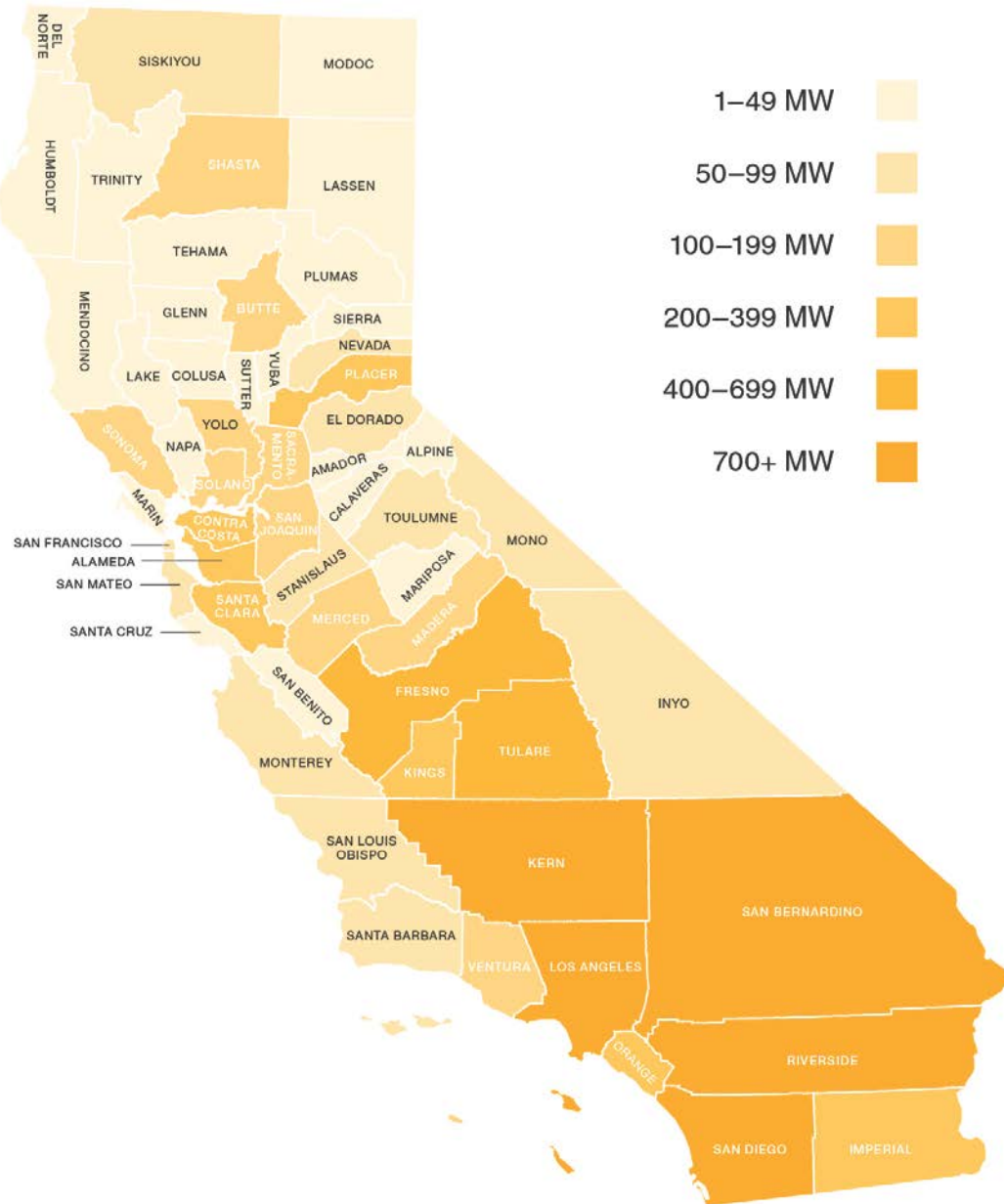
1. The table includes 0.167 MW of hybrid wind/ wind solar projects that are counted in solar.
2. This table includes 201 MW of other renewable that is defined as a wind, advanced energy storage, or hydro. Further, it includes any fuel cell, internal combustion engine, combustion turbine, microturbine, steam turbine, or "other" projects that takes service under one of the following specific interconnection programs and are therefore considered renewable: Standard NEM, RES_BCT, Expanded NEM, and NEMBIO. If fuel cell, internal combustion engine, combustion turbine, microturbine, steam turbine, or "other" projects did not start service under those specific interconnection programs, they are not considered renewable. The data were combined to protect the confidentiality of utility data.
3. There may be some overlap between the self-generation projects reported here and non-self-generation projects reported in Table 1 of about 190 MW.



California Energy Commission – Tracking Progress

Figure 12 graphically shows the data in Table 4.

Figure 12: Map of Capacity of On-Line and Pending Distributed Generation Systems by County (20 MW or Smaller, Includes Self-Generation, as of June 31, 2017)



Source: California Energy Commission staff



California Achieves Goal of 3,000 Megawatts of Self-Generation Solar Systems

Enacted more than a decade ago, Senate Bill 1 (Murray, Chapter 132, Statutes of 2006) set an ambitious goal for 3,000 megawatts of solar energy systems to be installed on new and existing residential and commercial sites by 2017 and for solar energy systems to be placed on 50 percent of new homes by 2020.

Three components of the 3,000 MW goal include:

1. 1,940 MW for IOUs for businesses and existing homes (including low-income programs) as part of the California Solar Initiative (CSI).
2. 700 MW for the POUs.
3. 360 MW in IOU service territory under the New Solar Homes Partnership (NSHP).

The state has already far exceeded the 3,000 MW goal with the installation of 5,800 MW, as noted. As of June 2017, the CSI program provided incentives for 1,876 MW of installed capacity and reserved funding for about 80 MW of pending capacity toward achieving the goal of 1,940 MW for commercial buildings and existing homes in IOU service territories.²⁰

Rebate funding through the CSI program overseen by the CPUC has been exhausted and closed on December 31, 2016, with some applications that are pending and may or may not come on-line. The Multi-Family Affordable Solar Housing (MASH) Program, which has also exhausted its funding, has supported the installation of 29.3 MW of solar interconnected across 396 projects statewide serving multifamily affordable housing and has project reservations totaling 23 MW.²¹ The Single-Family Affordable Solar Homes (SASH) Program, which is one of the remaining CSI programs, has installed more than 6,400 PV systems as of last year and continues to accept applications.

With a goal of 700 MW, nearly 500 MW of solar energy systems were installed as of the end of last year through programs administered by POUs.²²

New Solar Homes Partnership (NSHP) Program

In addition to the suite of CSI programs administered by the CPUC, as well as programs administered through POUs, the NSHP Program also supports the achievement of the state's ambitious distributed solar goals. Administered by the Energy Commission, NSHP provides financial incentives to encourage the installation of eligible solar energy systems on new residential construction. In May 2017, the program eligibility requirements were updated only to provide incentives for systems or the portion of systems not used by builders as part of the PV credit allowed for compliance under the *2016 Building Energy Efficiency Standards*. This shift positions the program to more strongly support the state's zero-net-energy building goals.

²⁰ http://www.californiasolarstatistics.ca.gov/reports/agency_stats/, updated June 2017.

²¹ CIS Multifamily Affordable Solar Housing (MASH) Program. <http://www.cpuc.ca.gov/General.aspx?id=3752>.

²² http://www.energy.ca.gov/sb1/pou_reports/.



California Energy Commission – Tracking Progress

As of July 1, 2017, about 232 MW was reserved or installed (**Table 5**).

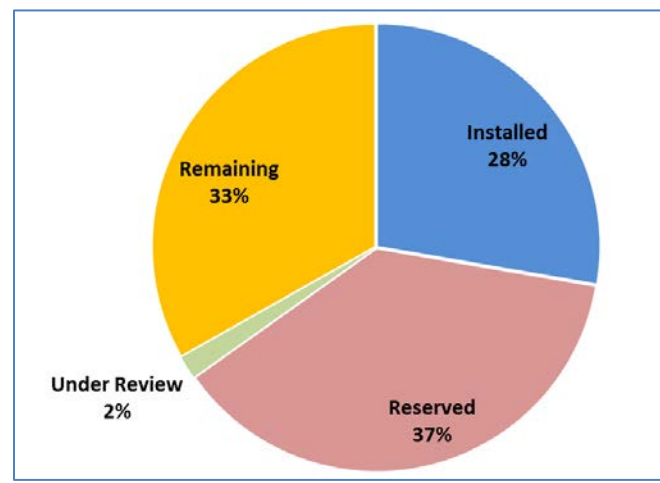
Table 5: NSHP Program Activity

	Number of Systems	\$ Millions	MW (AC)
Reserved	35,437	\$99.1	134
Installed	31,248	\$170.9	98
Total	66,685	\$270	232

Source: <http://www.gosolarcalifornia.ca.gov/about/nshp.php>. Updated July 2017

As shown in **Figure 13**, the program has reserved funds or installed 65 percent of the total capacity goal. Assuming all capacity under review is approved and installed, 33 percent of the overall program capacity goal remains for newly submitted applications. Additional information on quarterly progress and remaining program budget can be found on the Go Solar California website.²³

Figure 13: Progress Toward NSHP 360 MW Goal



Source: California Energy Commission staff. Updated July 2017.

The NSHP program also assists lower-income residents by providing higher per-watt incentives for eligible residential affordable housing projects with tax-exempt system owners. Since the program began, the NSHP program has funded the installation of more than 7 MW on low-income developments, with incentives totaling more than \$20 million. In 2016 alone, the NSHP program provided over \$2.58 million in incentives to 22 affordable housing projects across the state. These 2016 affordable housing incentives supported the installation of 1.6 MW of new solar capacity, which helped reduce electricity bills for more than 400 affordable homes either through a net-metering agreement, or more commonly through a virtual net-metering agreement. These affordable housing incentives accounted for 12 percent of the total incentives paid through the program in 2016.

²³ <http://www.gosolarcalifornia.ca.gov/documents/nshp.php>.



California Energy Commission – Tracking Progress

In March 2017, the program guidelines were updated to increase affordable housing participation, including increasing the incentive level for affordable housing, offering an incentive bonus for affordable housing located in disadvantaged communities, and broadening eligibility by removing the tax-exempt status requirement. The Energy Commission expects these changes will boost affordable housing participation in the NSHP program and will augment the benefits of the program for low-income Californians.

Renewable Energy Facility Siting in California

Utility-scale renewable energy facilities proposed on open land within California must receive environmental permits in compliance with the California Environmental Quality Act (CEQA). The Energy Commission has statutory responsibility for licensing thermal power plants 50 MW and larger, along with infrastructure associated with the plant, such as transmission lines to the first point of interconnection with the grid, fuel supply lines, and water pipelines. Typically, local jurisdictions like counties and cities are responsible for permitting solar PV and wind projects. For projects proposed on federal lands, federal agencies like the U.S. Bureau of Land Management (BLM) or the U.S. Forest Service may be responsible for renewable energy project permitting.

There are 2,360 MW of renewable energy projects in California that have received permits to build and secured power purchase agreements, suggesting a high likelihood that this capacity will come on-line to meet the state’s renewable energy goals. About 385 MW of this permitted and contracted capacity are estimated to come on-line during the remainder of 2017, as shown in **Table 6** below.

**Table 6: New Renewable Capacity Expected On-Line in 2017
(Not Including Self-Generation)**

Resource/Technology	Capacity (MW)	Percent of Total
Solar PV	254	66%
Solar Thermal	0	0%
Small Hydro	0	0%
Wind	131	34%
Biomass	0	0%
Geothermal	0	0%
Total	385	100%

Source: California Energy Commission staff. Updated June 2017.

There are 9,170 MW of renewable energy projects that have received permits to build in California, as shown in **Table 7**. This capacity includes the projects with contracts that are likely to be built and projects without contracts. Most of these proposed projects are also seeking to interconnect to the California Independent System Operator (ISO) controlled grid.²⁴ The current California ISO

²⁴ Generation resources interested in interconnection to the California ISO-controlled grid submit an interconnection request to the grid operator. The California ISO regularly performs clustered interconnection studies in phases, which inform the interconnection customer about grid conditions that might affect decisions about deliverability status, project size, meeting the



California Energy Commission – Tracking Progress

interconnection study queue contains roughly 36,330 MW of renewable generation projects. Currently 17,800 MW of the project capacity in the queue has completed the study process. The remaining 18,500 MW are in the Cluster 9 phased study process.²⁵ The large number of renewable projects with permits to build and seeking interconnection reflects the commercial interests competing for long-term contracts.

Due to frequent changes in project circumstances (for example, loss of developer financing, delays obtaining power purchase agreements, and inability to meet other agencies' permitting requirements), project status data are fluid. Therefore, the renewable energy siting information presented in **Tables 6 and 7** reflect a snapshot in time relative to the status of projects in the Energy Commission siting database.

interconnection financial security posting requirements, and so forth. Resources in the interconnection queue are reassessed annually.

25 http://www.aiso.com/Documents/Update_Renewables_GeneratorInterconnectionQueue-Feb2017.pdf.



California Energy Commission – Tracking Progress

Table 7: Renewable Projects That Have Received Environmental Permits – Not Operational

County	Biomass/ Landfill Gas		Solar PV		Solar Thermal		Geothermal		Wind		Small hydro		Total	
	Count	MW	Count	MW	Count	MW	Count	MW	Count	MW	Count	MW	Count	MW
Alameda			3	29					1	90			4	118
Colusa			1	20									1	20
Contra Costa			2	14									2	14
Fresno			18	415									18	415
Glenn	1	2											1	2
Imperial			15	1,101			3	212					18	1,313
Kern			24	1,149					12	1,617			36	2,766
Kings			5	177									5	177
Lassen			1	5									1	5
Los Angeles	1	27	20	670							1	4	22	707
Madera			2	71									2	71
Marin	1	8											1	8
Merced			3	205									3	205
Mono							1	33					1	33
Monterey	1	4	3	284									4	288
Napa			1	7									1	7
Orange			5	11									5	11
Placer	1	2											1	2
Riverside			6	1,462									6	1,462
Sacramento			2	8									2	8
San Benito			1	247									1	247
San Bernardino			15	375	1	50							16	425
San Diego			3	147					2	200			5	347
San Joaquin			4	25									4	25
Santa Barbara			1	40									1	40
Santa Clara	1	3	7	16									8	19
Solano			1	1									1	1
Sonoma							3	113					3	113
Stanislaus			5	270									5	270
Tulare	1	2	1	46									2	48
Ventura			2	5									2	5
Yolo			1	2					1	2			2	3
Yuba			1	1									1	1
Grand Total	6	47	155	6,800	1	50	7	360	16	1,910	1	4	186	9,170

Source: California Energy Commission staff. Totals may not sum due to rounding. Capacity represents nameplate capacity. Solar PV capacity is AC. Includes projects in preconstruction or under construction. Updated June 2017.



California Energy Commission – Tracking Progress

Renewable Energy Transmission Initiative 2.0

To simplify long-term energy system planning, interagency coordination, and stakeholder engagement necessary to support California’s 2030 climate and renewable energy goals, the California Natural Resources Agency, Energy Commission, CPUC, California ISO, and BLM California Office convened the Renewable Energy Transmission Initiative (RETI) 2.0 in September 2015. RETI 2.0 promoted a proactive, statewide, nonregulatory planning forum to identify the constraints and opportunities for new transmission to access and integrate new renewable resources. RETI 2.0 encouraged open and transparent participation from tribal and local governments, public power entities, other western states, regional energy planning bodies, and energy, environmental, and agricultural stakeholders.

The RETI 2.0 process examined the emerging transmission implications of accessing a diverse and balanced renewable energy portfolio and the transmission system needed to accommodate a future electricity system based predominantly on renewable energy. RETI 2.0 assessed long-term, large-scale development scenarios in individual areas to test the capability of the system and identify potentially major new transmission needs. Several potential transmission constraints were identified in California and along the major import-export paths that could limit the delivery of additional renewable energy. Several conceptual options were considered to address these constraints, including new transmission, advanced technologies, nonwire alternatives, and operational efficiencies.

RETI 2.0 concluded with the posting of the final plenary report and three supporting technical reports in February 2017.²⁶ The summaries, conclusions, and recommendations in the final plenary report and supporting technical reports are intended to inform future state regulatory and policy proceedings and may be useful to renewable and transmission developers, environmental and community groups, and local, regional, and federal government entities.

Planning Renewable Energy for Growth

Developing energy infrastructure in appropriately planned areas that consider a wide range of potential land use constraints and conflicts can reduce environmental impacts, lower mitigation costs, and help ensure that renewable resources can be developed to meet California’s policy goals. Land use constraints and conflicts include environmentally sensitive areas (biology, water quality, and so forth), conservation goals and other land use designations, tribal cultural resources, and stakeholder identified concerns. These areas are “low-conflict land-use areas.” The Energy Commission is engaged in landscape-scale planning to proactively identify low-conflict land use areas in California with valuable renewable resources and associated transmission development to meet the potential rush of commercial interest in developing renewable energy facilities to meet the 50 percent RPS by 2030 requirement. With forward-looking, landscape-level planning, California will be better prepared to inform the spatial considerations of new procurement, help developers select feasible development locations, assist local permitting jurisdictions, accelerate and shorten the planning and permitting periods, lower development costs and preserve/conservate environmentally or culturally sensitive lands.

26 The RETI 2.0 final plenary and supporting technical reports can be found at <http://www.energy.ca.gov/reti/>.



Additional References:

For more information on the Renewables Portfolio Standard, please see <http://www.energy.ca.gov/portfolio/index.html>. For more information on investor-owned utility, electric service provider, and community choice aggregator progress, see the RPS Quarterly Reports and the Status of RPS Projects, available at http://www.cpuc.ca.gov/RPS_Homepage/.

Project viability information is available at <http://www.cpuc.ca.gov/NR/rdonlyres/CFD76016-3E28-44B0-8427-3FAB1AA27FF4/0/FourthQuarter2010RPSReporttotheLegislature.pdf> (page 4) and <http://www.cpuc.ca.gov/PUC/energy/Renewables/procurement.htm> (Project Viability Calculator).

For more information on the *Bioenergy Action Plan* and the latest proceeding, see http://www.energy.ca.gov/bioenergy_action_plan/index.html.

For more information on the amount of new renewable procurement required to achieve 33 percent by 2020 (also known as the Renewable Net Short), see http://www.energy.ca.gov/2013_energypolicy/documents/.

For further information on all (renewable and nonrenewable) Energy Commission-jurisdictional power plants, see http://energy.ca.gov/sitingcases/all_projects.html.

For additional information on RETI 2.0, see <http://www.energy.ca.gov/reti/>.

For more information on RPS-eligibility, see the *Renewables Portfolio Standard (RPS) Eligibility Guidebook*, see <http://www.energy.ca.gov/renewables/documents/>.

Data Sources:

Statewide Electricity Retail Sales

California Energy Demand Update 2015 - 2025 Forecast.

<http://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SF.pdf>

Renewables

The following data sources were used to prepare the figures:

[1] California Hydroelectric Statistics and Data. Total Hydroelectricity Production (In gigawatt-hours; includes imports). http://www.energy.ca.gov/almanac/renewables_data/hydro/. (For 1983-1996, small hydropower is estimated as 13 percent of all hydropower reported on this table.)

[2] California Biomass and Waste-to-Energy Statistics and Data. Biomass and Waste-to-Energy Electricity Production for 1983-1996. These data include two waste-to-energy plants that are not RPS-eligible. http://www.energy.ca.gov/almanac/renewables_data/biomass/.

[3] California Geothermal Energy Statistics and Data. Geothermal Electricity Production. These data used for 1983-1996. http://www.energy.ca.gov/almanac/renewables_data/geothermal/.

[4] California Solar Energy Statistics and Data. Solar Thermal Electricity Production. These data used for 1983-1996. <http://energyalmanac.ca.gov/renewables/solar/index.html>.



California Energy Commission – Tracking Progress

- [5] California Wind Energy Statistics and Data. Wind Electricity Production. These data used for 1983-1996. <http://www.energy.ca.gov/wind/index.html>.
- [6] California Electrical Energy Generation, 1997 to 2001. Total Production, by Resource Type (gigawatt-hours). http://energyalmanac.ca.gov/electricity/electricity_generation.html. (For 1997-2001 small hydropower is estimated as 13 percent of all hydropower reported on this table).
- [7] Gross System Power From the Net System Power Report (2002-2006) and Revised Total Electricity System Power for California (2007-current). In-state and imports. http://energyalmanac.ca.gov/electricity/electricity_generation.html.
- [8] The Quarterly Fuel and Energy Report is data-collected consistent with California Code of Regulations, Title 20, Division 2, Chapter 3, Section 1304 (a) (1)-(3). For more information, please contact Michael Nyberg, Michael.Nyberg@energy.ca.gov.
- [9] Status of RPS Projects. CPUC tracks contracts for projects that are on-line, under development, and pending CPUC approval. Withdrawn and cancelled projects are also included. The project list is updated monthly. http://www.cpuc.ca.gov/RPS_Homepage/
- [10] California Energy Commission Energy Facility Status of Power Plant Projects since 1996. http://www.energy.ca.gov/sitingcases/all_projects.html.
- [11] Power Source Disclosure filings (SB 1305). <http://www.energy.ca.gov/pcl/>.
- [12] CPUC RPS compliance filings, <http://www.cpuc.ca.gov/General.aspx?id=3856>.
- [13] California Energy Commission RPS compliance filings.
- [14] Local Publicly Owned Electric Utilities' Reported Renewable Procurement Status for Compliance Period 1, http://www.energy.ca.gov/portfolio/pou_rulemaking/2013-RPS-01/POU_Reported_2011-2013_RPS_Percentage_Table.pdf
- [15] California ISO Daily Renewables Watch, <http://www.caiso.com/green/renewableswatch.html> .

Renewable Distributed Generation

The following data sources were used to prepare the figures:

- [D1] California Public Utilities Commission, http://www.cpuc.ca.gov/RPS_Homepage/.
- [D2] California Energy Commission, S-2 and S-5 Supply Forms from 2015 available at http://www.energy.ca.gov/almanac/electricity_data/s-2_supply_forms_2015/.
<https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-IEPR-02>.
- [D3] Southern California Edison SB 32 procurement <http://www.sce.com/EnergyProcurement/renewables/crest.htm>.
- [D4] Pacific Gas and Electric SB 32 procurement <http://www.pge.com/b2b/energysupply/wholesaleelectricssolicitation/standardcontractsforpurchase/>.



California Energy Commission – Tracking Progress

- [D5] San Diego Gas & Electric SB 32 procurement <http://www.sdge.com/regulatory-filing/654/feed-tariffs-small-renewable-generation>.
- [D6] SMUD: <https://www.smud.org/en/business/environment/solar-for-your-business/feed-in-tariffs.htm>.
- [D7] LADWP: https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-gogreen/c-gg-localrenewableenergyprogram?_adf.ctrl-state=ano50oi7c_4&_afLoop=237938105011783.
- [D8] Self-Generation Incentive Program: <http://energycenter.org/index.php/incentive-programs/self-generation-incentive-program>.
- [D9] New Solar Homes Partnership <https://www.newsolarhomes.org/WebPages/Public/Reports.aspx>.
- [D10] California Solar Initiative <http://www.californiasolarstatistics.ca.gov/>.
- [D11] Senate Bill 1 Solar PV: http://energy.ca.gov/sb1/pou_reports/index.html.
- [D12] Historical generation in California: http://www.energy.ca.gov/almanac/electricity_data/web_qfer/.
- [D13] Data from the California ISO on facilities interconnected in 2016.
- [D14] Q3 2016 IOU Interconnection Reports.
- [D15] U.S. Energy Information Administration Electric Power Monthly, November 2015, Table 1.17.B. <http://www.eia.gov/electricity/monthly/pdf/epm.pdf>.

Contacts:

- Renewable capacity and generation: Le-Huy Nguyen, Le-Huy.Nguyen@energy.ca.gov
- Renewable capacity larger than 1 MW nameplate: Michael Nyberg, Michael.Nyberg@energy.ca.gov.
- Self-generation capacity and New Solar Homes Partnership: Elizabeth Hutchison, Elizabeth.Hutchison@energy.ca.gov
- POU RPS progress: Emily Lemei, Emily.Lemei@Energy.ca.gov
- Renewable energy facilities permitting: Joseph Merrill, Joseph.Merrill@energy.ca.gov

Media inquiries should be sent to the Media and Public Communications Office at (916) 654-4989 or by email at mediaoffice@energy.ca.gov.

Next update:

December 2017