Comparative Analysis of Utility Services & Rates in California

California Public Utilities Commission

Policy & Planning Division

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Comparative Analysis of Utility Services & Rates in California

This is a comparative analysis of California's public utility services —electricity, gas, water, and broadband—by examining the cost and usage by customers for each utility service at the ZIP code level. Using a smaller geographical level provides us a better picture of utility cost and usage in California. This also enables us to gather information and identify important relationships, patterns, and trends in each utility that could serve as a resource to inform the public and improve utility regulation by the Commission.

Using the bill and usage data, together with the data on median income, number of customers, low-income programs, and population, we try to answer following questions:

1. What is the average bill for electricity, gas, and water;
2. Where are the largest electric, gas, and water users in the State;
3. How do income and climate affect utility usage;
4. Where does the cost of utility bills fall the heaviest on low-income households; and
5. What areas are most in need for low income services and/or outreach about conservation.

The ZIP code level data for electricity and gas were obtained from the four largest Investor Owned Utilities serving Californians (Pacific Gas & Electric (PG&E), Southern California Edison (Edison), San Diego Gas and Electric (SDG&E), and Southern California Gas (SoCal Gas)). The water data were obtained from 9 Class A, 4 Class B, and 24 Class C water utility companies.[1] For broadband, the advertised wired download and upload speed data were obtained from the CPUC's Communications Division, which collects this information from broadband providers in the State. All of the utility data are for the year 2014 only. Finally, the income and population data were obtained from the U.S. Census Bureau.

The Utility Interactive Map Project

The byproduct of this analysis is the development of a series of interactive maps that present the collected utility data and socioeconomic data at the ZIP code level. Although many of these data are publicly available, they are not presented in a form that ordinary consumers can understand and explore easily. By translating complex utility data into simpler, more usable, and intuitive interactive maps, the CPUC will help ratepayers visualize and understand many of the utility issues—from cost to consumption to efficiency and more—that California faces today.

When we do one of the things that we are able to do as a public regulatory agency (i.e. analyzing complex data), and then transform that into something beneficial to Californians (i.e. an interactive map in this case), we are creating a tool of public value. It is on this concept that the Utility Interactive Map Project is based.

Using a geographical information system (GIS) platform, we developed and designed the maps in this analysis and those in the Interactive Map Project to analyze and interpret the relationships, trends, and patterns within different utility datasets. Depending on the response and interest this project generates, this initiative could become a long-term effort to make utility data more accessible, usable, understandable, and interactive.

Interactive map link http://arcg.is/1xlfLjw

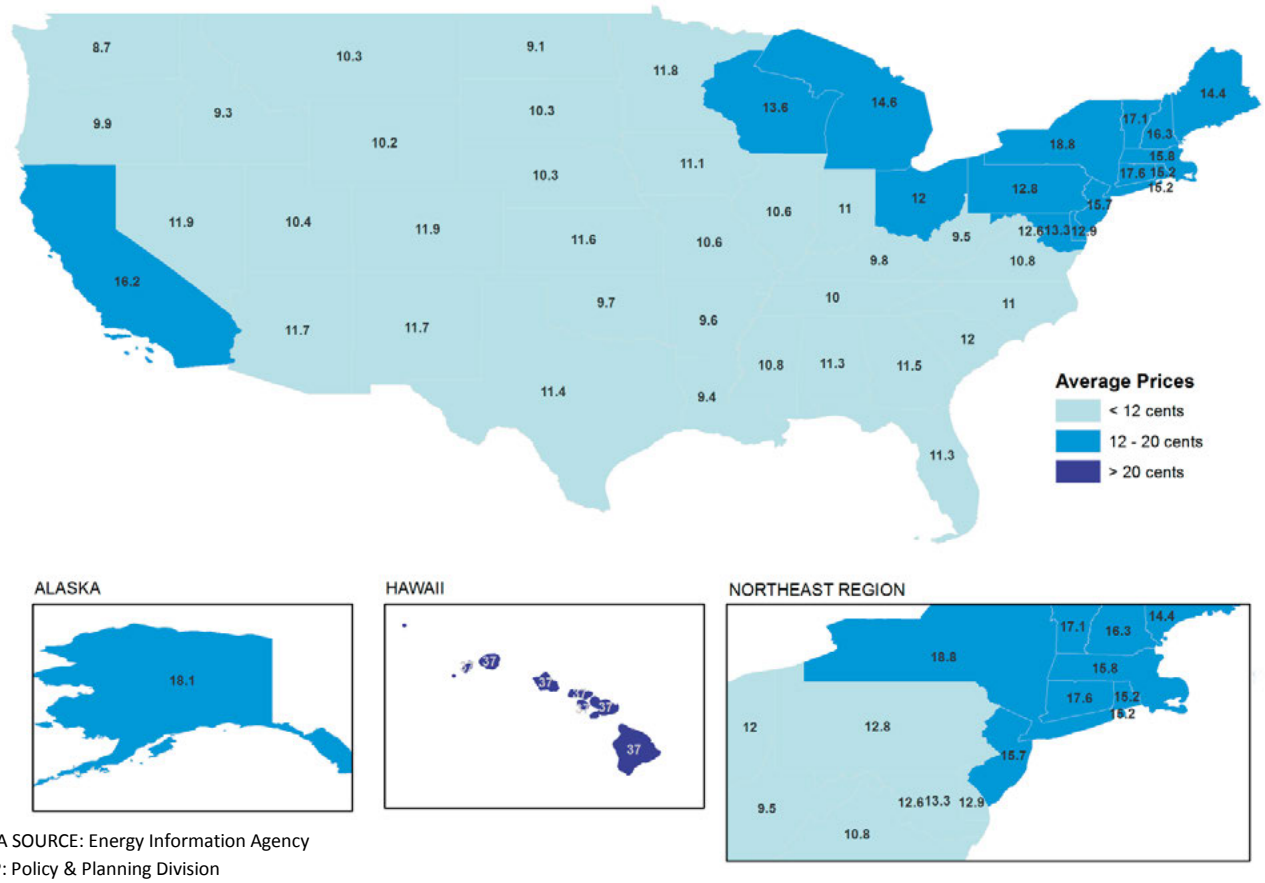
[1] Class A companies have 10,000 or more service connections, Class B companies have 2,000 or more connections, and Class C companies have 500 or more connections.

1. Electricity

Average Bill

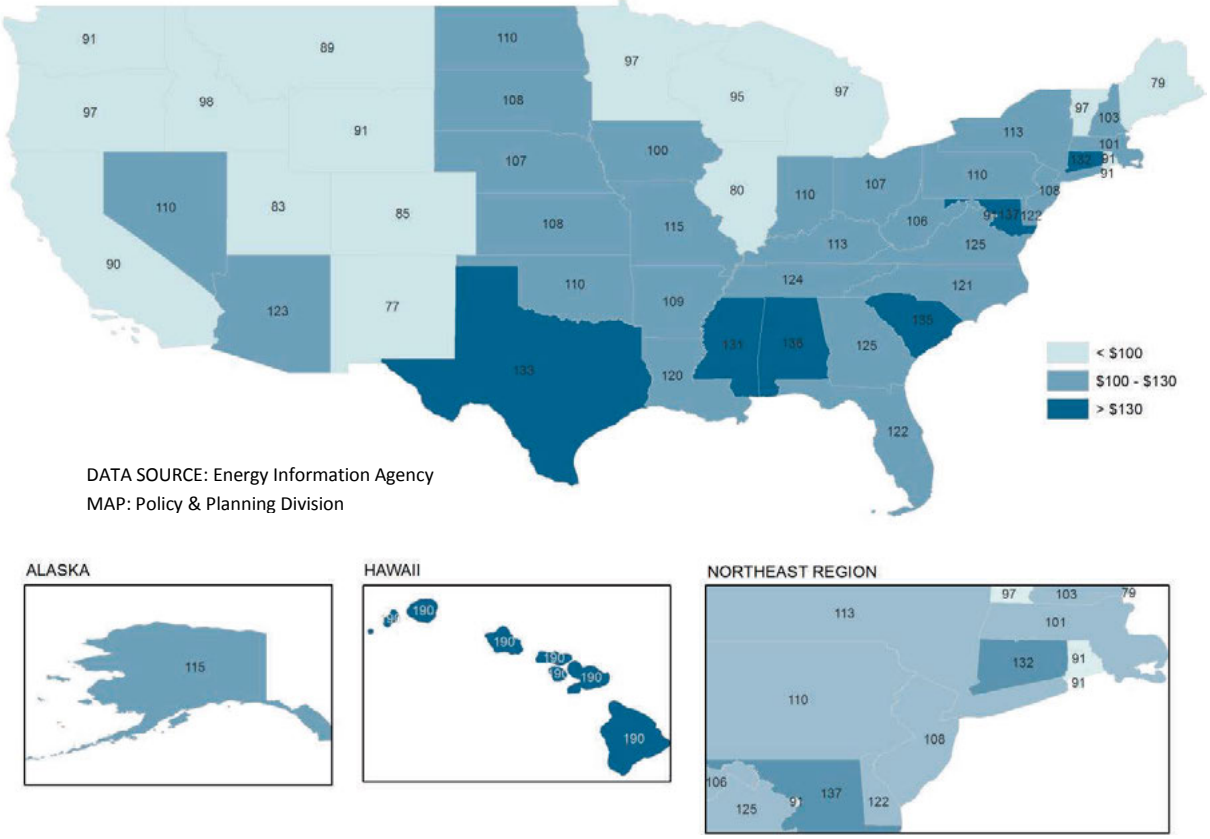
Residential electric customers in California pay an average of 16 cents per kilowatt-hour (kWh), among the highest rates in the nation. However, monthly average bills in the State tell a different story. At $90 per month, Californians' electric bills are among the lowest in the 50 states. Our comparatively low average bills are attributable to the fact that the electricity consumption per capita in California homes has remained among the lowest in the nation.

CALIFORNIA'S ELECTRICITY RATES ARE AMONG THE HIGHEST IN THE NATION



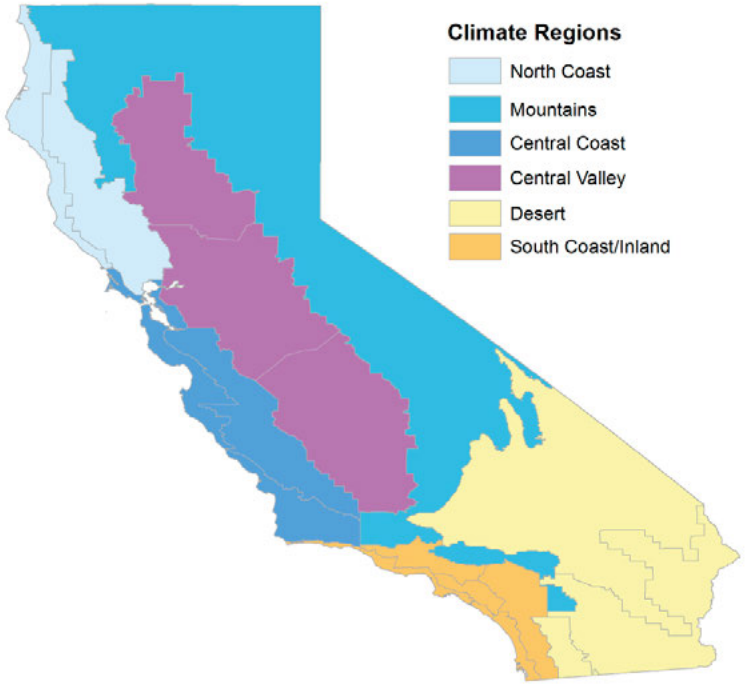
DATA SOURCE: Energy Information Agency
MAP: Policy & Planning Division

CALIFORNIA'S AVERAGE MONTHLY ELECTRICITY BILLS ARE AMONG THE LOWEST



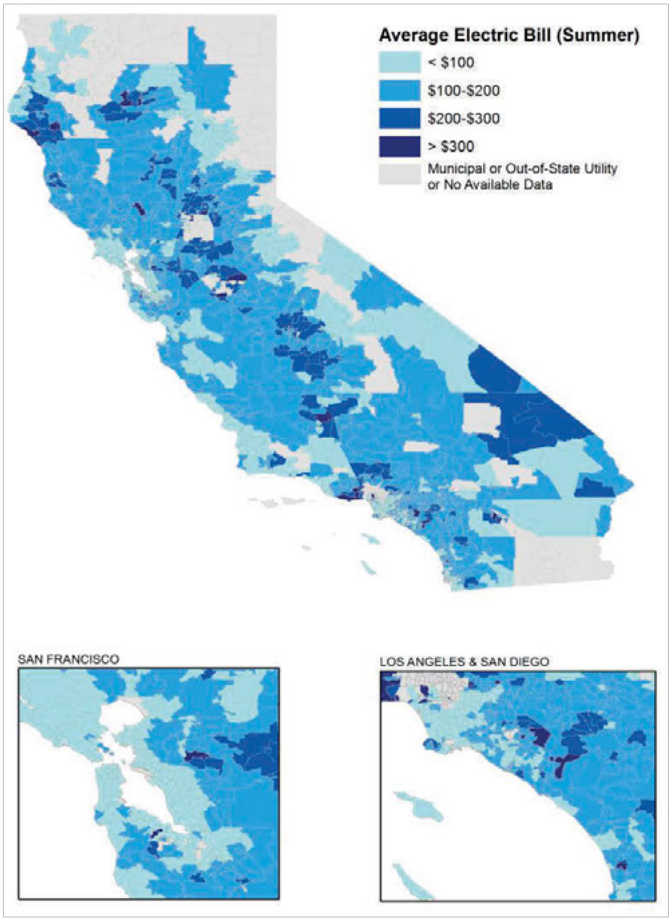
California's summer electric bill profile differs dramatically from that of the winter profile. The bill data at the ZIP code level gathered from the electric utilities reveal higher average bills in California when data are divided into two seasons: $119 in the summer and $91 in the winter. Households in 1,144 ZIP codes, roughly 63% of residential customers, have average summer electric bills higher than the state average of $90, while 300 ZIP codes or 37% have average bills lower than $90. Within the high-bill areas (for the purpose of this analysis, any ZIP code with average bills higher than $200 are high-bill areas), only 9% of residential customers have average summer bills that are over $200.

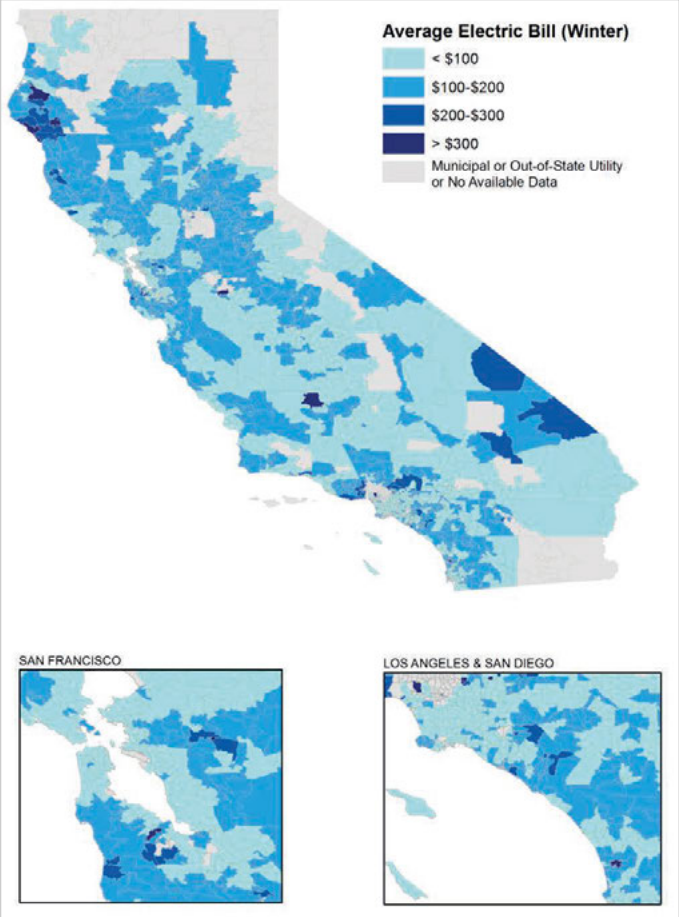
CALIFORNIA'S CLIMATE REGIONS



In the winter, only 955 ZIP codes, or roughly 56% of residential customers, have average electric bills higher than the state average of $90. The situation changes significantly if we consider only the high-bill areas: only 84 ZIP codes, or 5% of residential customers, have average bills over $200. This trend is not surprising as electricity usage tends to drop more during the cooler months than the warmer months due to reduced need for air conditioning.

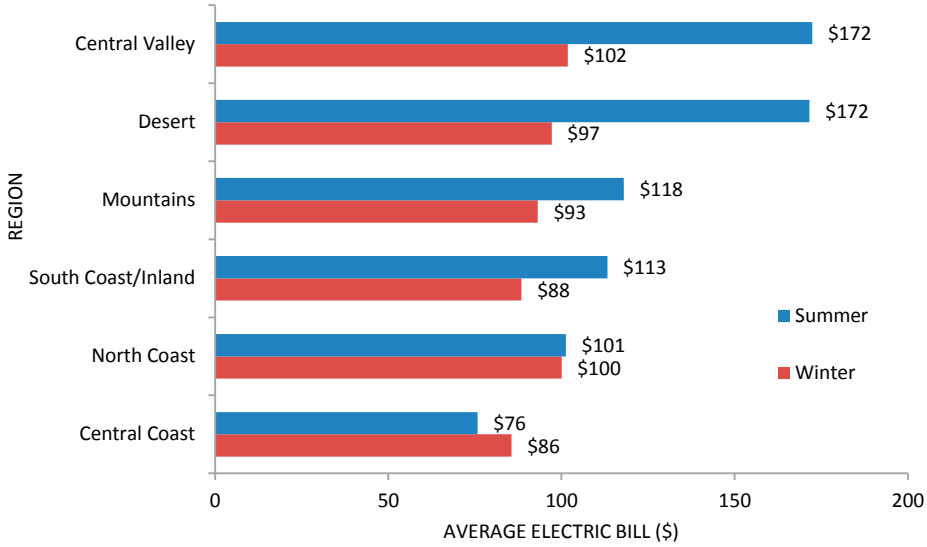
AVERAGE MONTHLY ELECTRIC BILLS IN CALIFORNIA DIFFER BY REGION





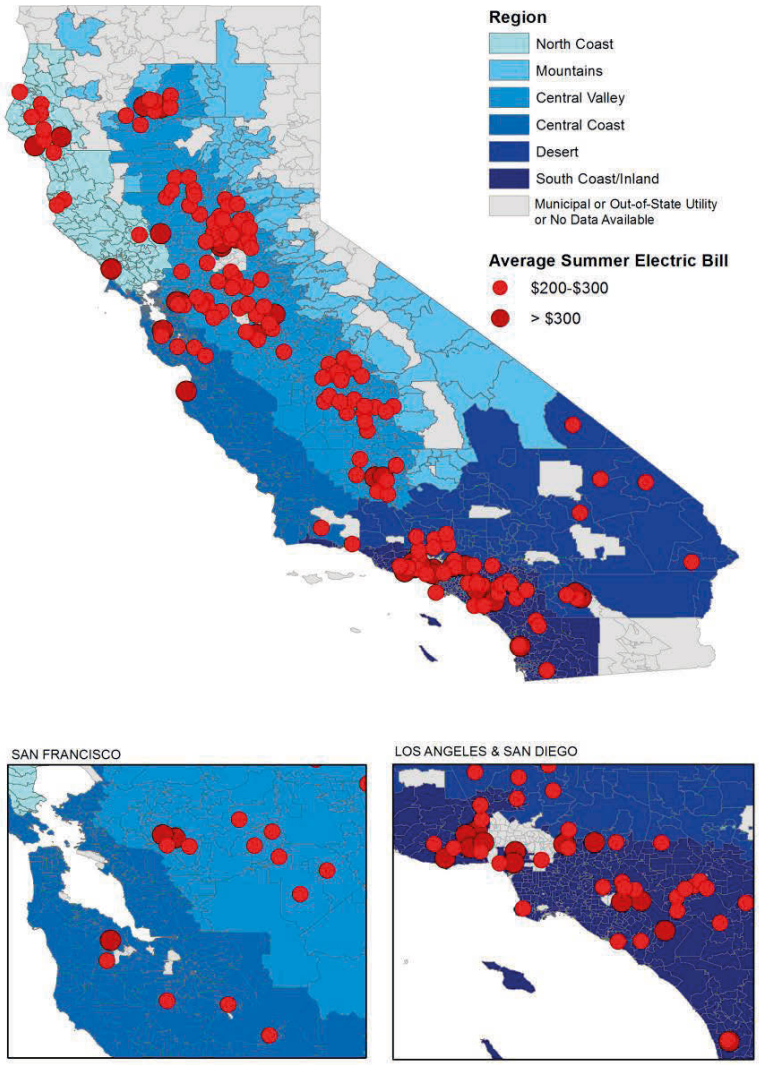
Geographically, California is divided into six regions in this analysis based on climate: North Coast, Mountains, Central Valley, Central Coast, Desert, and South Coast/Inland.[2] In the summer, average bills are highest for households in the Central Valley and Desert Regions at $172. Mountains and South Coast/Inland Regions follow third and fourth with average bills of $118 and $113, respectively.

AVERAGE MONTHLY ELECTRIC BILLS IN CALIFORNIA DIFFER BY REGION



[2] These divisions according to climate zone are based on the 16 Building Climate Zone Areas developed by the California Energy Division. For this analysis, the 16-region classification was simplified to a 6-region classification due to similarities among the regions.

HIGH-BILL ZIP CODES ARE IN CENTRAL VALLEY AND SOUTH COAST



Conversely, average bills are lowest for both summer and winter in the Central Coast at $76 and $86, respectively. Average electric bills go down in all regions during the winter except in the Central Coast, where there is a slight increase. The largest declines are registered in both Central Valley and Desert Regions. Overall, the winter averages by region are very similar, unlike the summer averages. Below are the top 15 ZIP Codes in California with highest average summer and winter electric bills.

If we look at just the high bills (those over $200 in the summer) and identify their locations, the data reveal that majority of these high-bill ZIP codes are in the Central Valley and a significant number of these areas is in South Coast/Inland. There are only few ZIP codes in the San Francisco Bay Area that have very high electric bills in the summer, which is attributable to the area's cooler climate. On the other hand, the warmer summer climate contributes to the significant number of high bills in the Los Angeles and San Diego areas.

ZIP CODES WITH THE HIGHEST AVERAGE SUMMER AND WINTER ELECTRIC BILLS IN CALIFORNIA

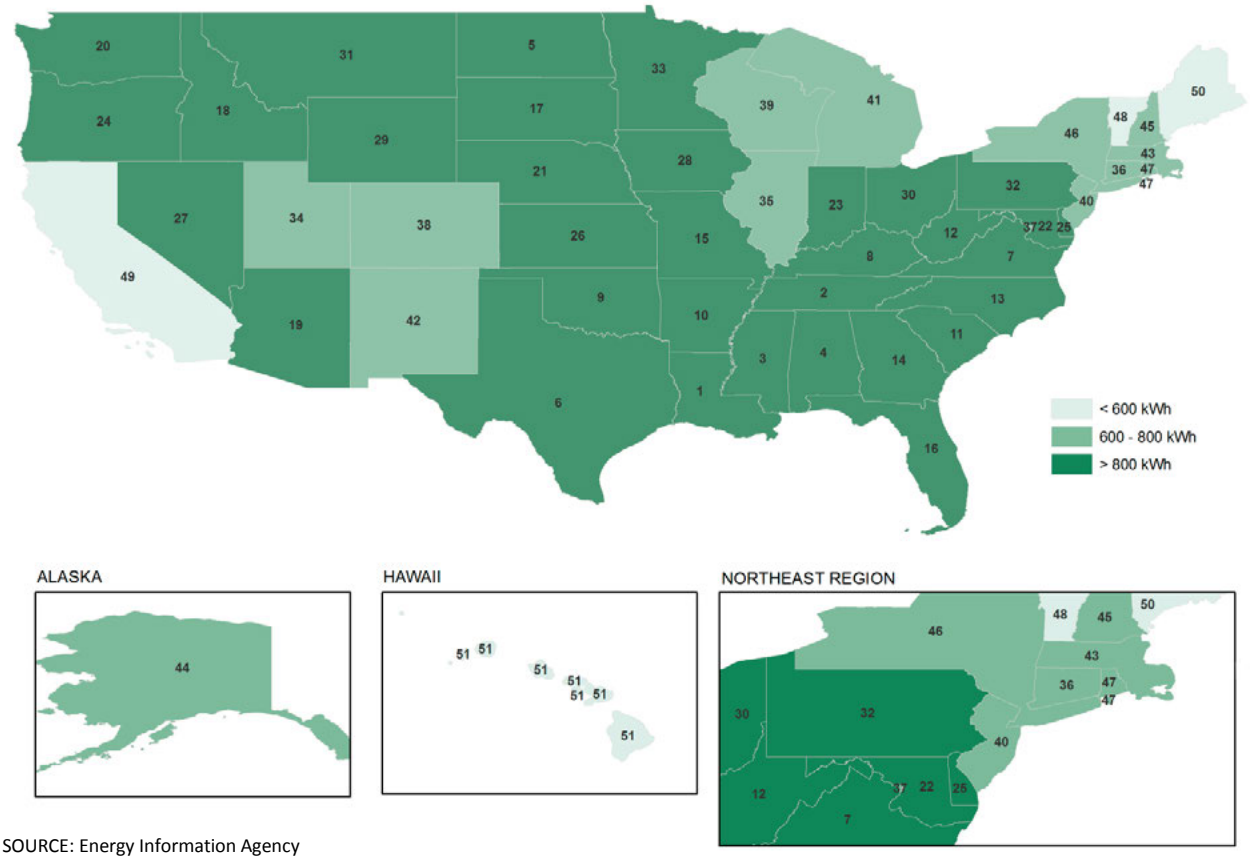
Rank	Utility	City	ZIP Code	Average Summer Bill
1	SCE	CANOGA PARK	91304	$927
2	SDG&E	SAN DIEGO	92067	$534
3	SCE	BEVERLY HILLS	90210	$516
4	SCE	INDIAN WELLS	92210	$478
5	PG&E	ATHERTON	94027	$470
6	PG&E	OAKVILLE	94562	$445
7	PG&E	RUTHERFORD	94573	$432
8	PG&E	DIABLO	94528	$427
9	SCE	DUARTE	91008	$414
10	SCE	WEST HILLS	91307	$398
11	PG&E	GRANITE BAY	95746	$390
12	SCE	CALABASAS	91302	$379
13	SCE	VILLA PARK	92861	$365
14	PG&E	BROOKS	95606	$345
15	PG&E	ALAMO	94507	$340

Rank	Utility	City	Zip Code	Average Winter Bill
1	SCE	CANOGA PARK	91304	$744
2	SDG&E	SAN DIEGO	92067	$480
3	PG&E	ATHERTON	94027	$477
4	SCE	BEVERLY HILLS	90210	$418
5	PG&E	DIABLO	94528	$386
6	PG&E	WHITETHORN	95589	$360
7	PG&E	WEOTT	95571	$347
8	PG&E	RUTHERFORD	94573	$336
9	PG&E	OAKVILLE	94562	$330
10	SCE	DUARTE	91008	$302
11	PG&E	ALDERPOINT	95511	$301
12	PG&E	KNEELAND	95549	$301
13	PG&E	MIRANDA	95553	$298
14	SCE	INDIAN WELLS	92210	$287
15	SCE	MALIBU	90265	$284

Average Usage

At 557 kWh per month, California's average residential electricity use is among the lowest in the nation. In fact, Californians use about 33% less electricity at home than do customers in the rest of the country. Overall, electricity consumption in the state has remained relatively constant for the last four decades, and forecasts show this trend will continue at least in the near future.

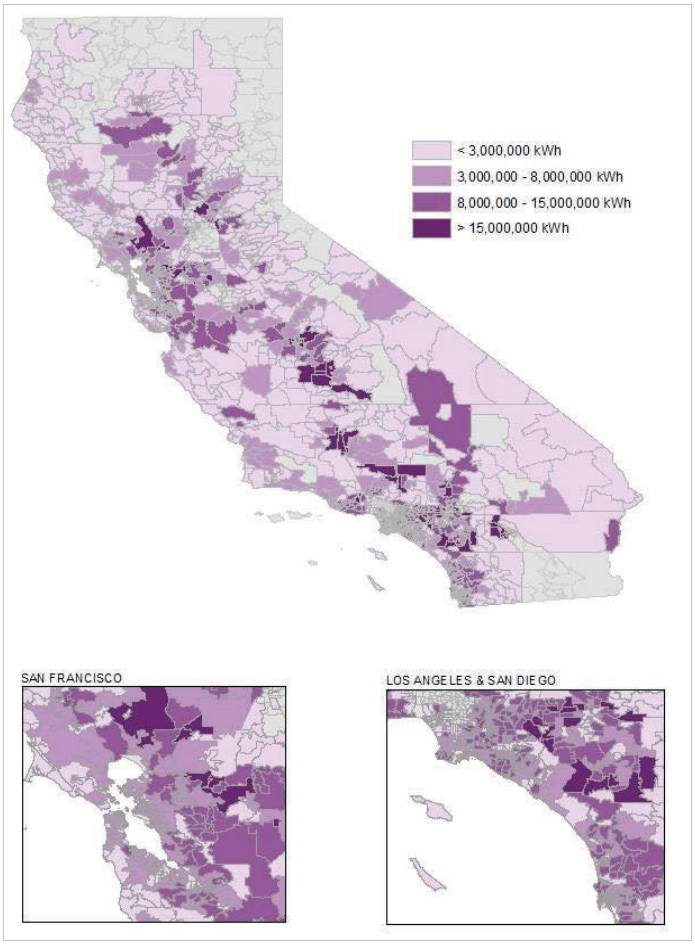
CALIFORNIA'S ELECTRICITY USAGE IS THE 49TH LOWEST IN THE NATION

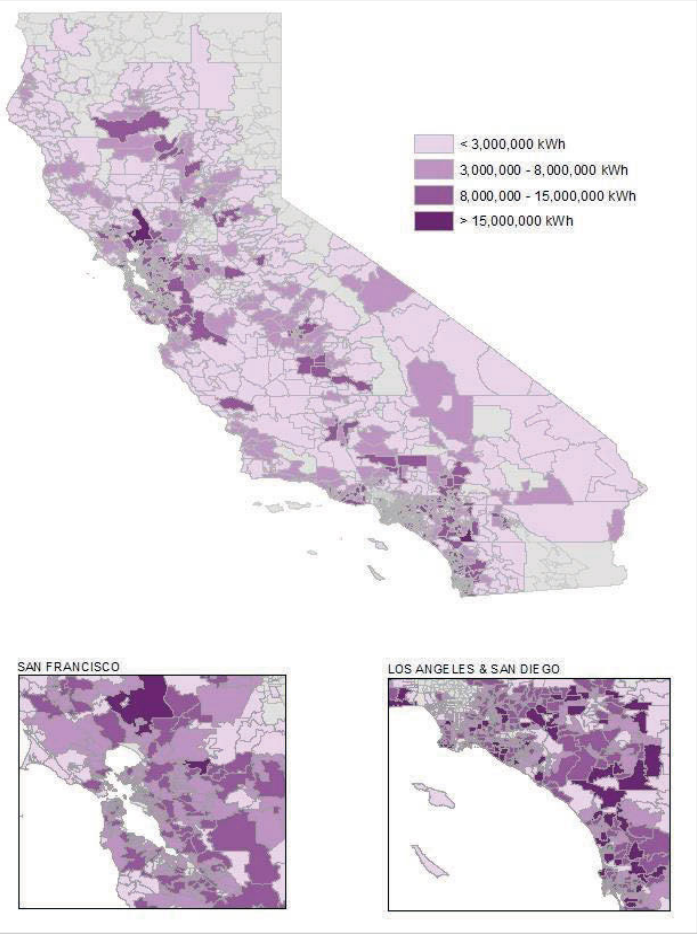


DATA SOURCE: Energy Information Agency
MAP: Policy & Planning Division

The electricity usage data at the ZIP code level reveal that 1,009 ZIP codes, which translate to about 52% of the total residential customers, have higher average consumption than the state average of 557 kWh in the summer.
In high-usage areas (ZIP codes with usage higher than 1,000 kWh), about 12% of residential customers have usage that are higher than 1,000 kWh in the summer. California's milder climate does not require much cooling or heating in the winter season, and therefore leads to a significant 19% drop in household usage. The number of ZIP codes that have average electric usage higher than the state average of 557 kWh decreased from 1,009 to 828, which is roughly about 31% of the total residential customers. Moreover, kWh use in high-usage areas during the winter accounts for only 0.7% of the total customers in the state.

ELECTRICITY USAGE IN CALIFORNIA IS HIGHEST IN THE COASTAL AND INLAND AREAS



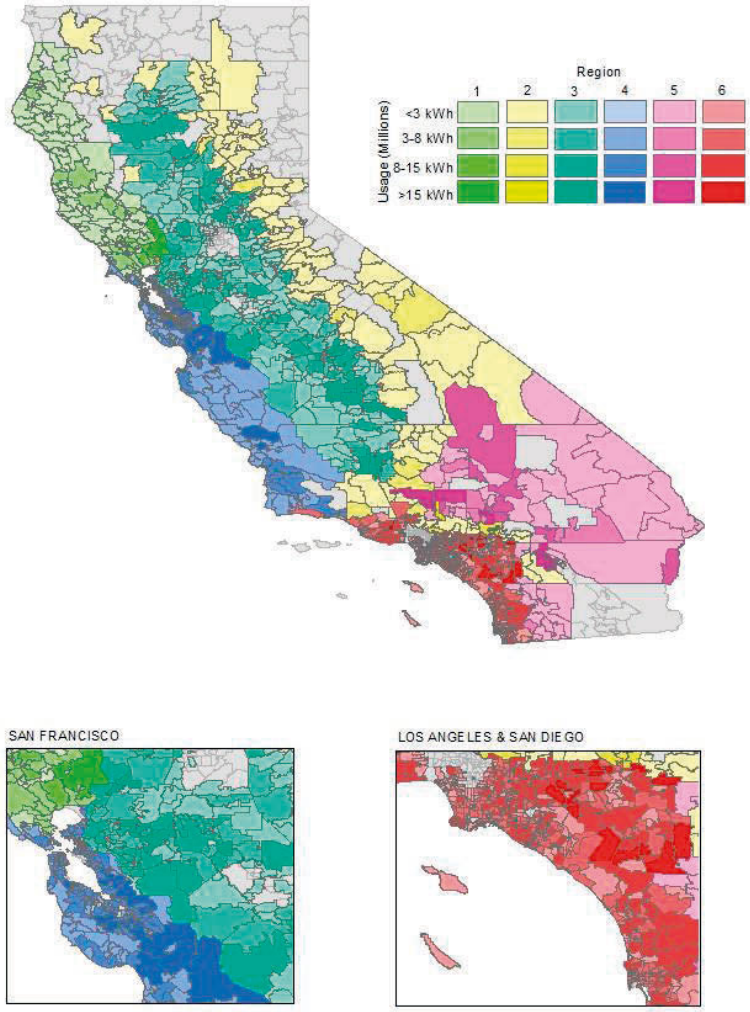


ZIP CODES WITH THE HIGHEST AVERAGE SUMMER AND WINTER ELECTRIC USAGE IN CALIFORNIA

Rank	ZIP Code	City	Average Summer Usage (kWh)
1	91304	Canoga Park	3,789
2	92210	Indian Wells	2,420
3	90210	Beverly Hills	1,912
4	92067	Rancho Santa Fe	1,693
5	91008	Duarte	1,679
6	94027	Atherton	1,627
7	91364	Woodland Hills	1,627
8	94562	Oakville	1,560
9	94528	Diablo	1,530
10	94573	Rutherford	1,517
11	95564	Samoa	1,490
12	92861	Villa Park	1,460
13	95571	Weott	1,456
14	92657	Newport Coast	1,302
15	94507	Alamo	1,300

Rank	ZIP Code	City	Average Winter Usage (kWh)
1	91304	Canoga Park	3,261
2	95564	Samoa	1,849
3	94027	Atherton	1,820
4	92067	Rancho Santa Fe	1,682
5	90210	Beverly Hills	1,598
6	95589	Whitehorn	1,549
7	94573	Rutherford	1,508
8	94528	Diablo	1,503
9	95571	Weott	1,496
10	94562	Oakville	1,454
11	95549	Kneeland	1,427
12	91364	Woodland Hills	1,386
13	91931	Guatay	1,354
14	95553	Miranda	1,348
15	95511	Alderpoint	1,307

ELECTRICITY USAGE IN CALIFORNIA DIFFERS BY CLIMATE ZONE



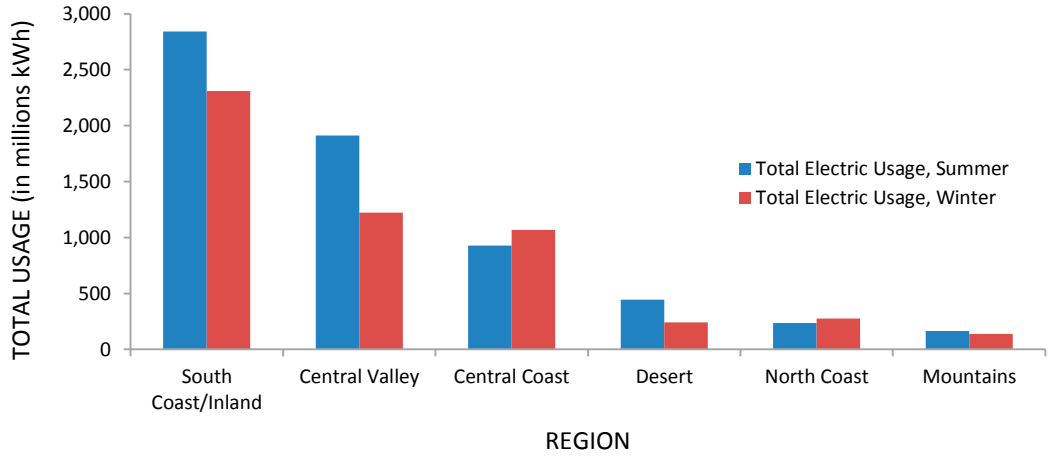
Electricity Usage by Climate Regions

California has different climate regions, and therefore, residential electricity consumption patterns also depend on where customers reside as energy needs change in every region. Summer usage levels differ per ZIP code within each region, and show that each region has distinctive areas with high usage. In the Central Valley for example, the northern and southern parts have some of the highest usage in the region.

Similarly, South Coast/ Inland's high-usage areas are in the portion closest to the Desert Region. The Mountains Region is the only region that appears to have an almost uniform usage. The Central Coast's northern part, specifically East Bay and South Bay areas, has the highest electricity usage in that region.

In 2014, the aggregate electricity usage in the summer is highest in the South Coast/Inland, followed by Central Valley and Central Coast, and lowest in the Mountains. Total usage declined in every region during the winter except in Central Coast and North Coast Regions, where there were slight increases of 15% and 16% respectively. The largest decline in the winter occurred in the Desert Region, where electric consumption dropped by 46%.

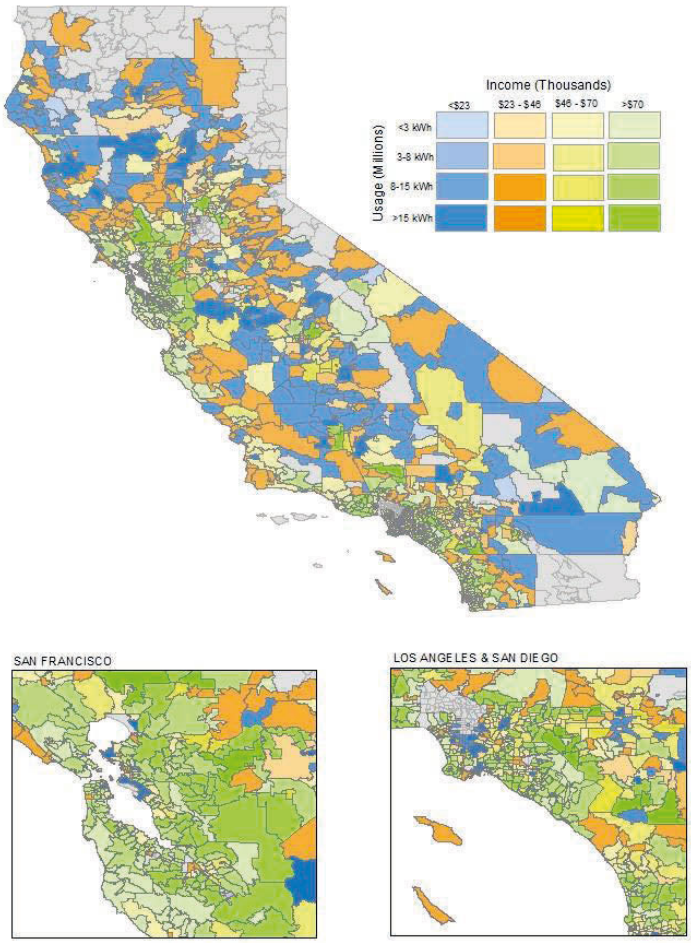
TOTAL ELECTRICITY USAGE IN CALIFORNIA DIFFERS BY REGION



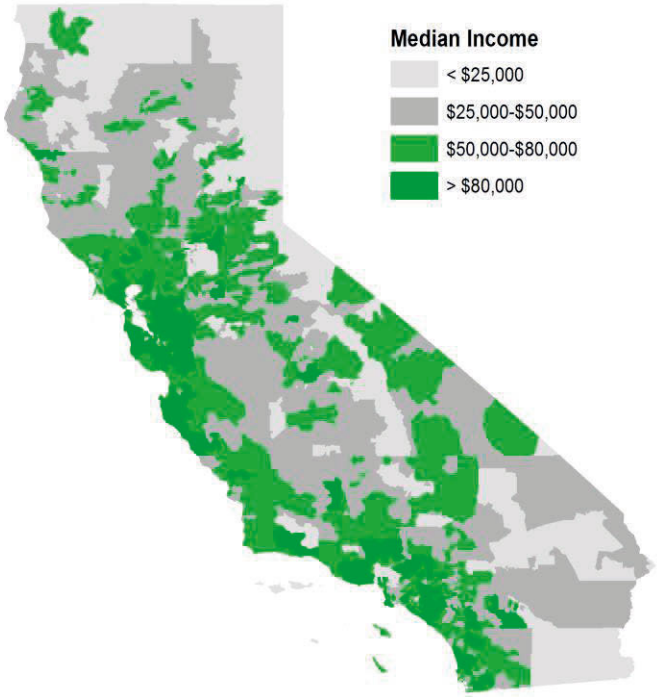
Electricity Usage by Income

Household income is another important determinant of electricity usage. The income distribution shows that high-income areas are concentrated around the San Francisco, Sacramento, Los Angeles and San Diego urban areas. Conversely, most of the low-income areas are located in the North Coast, Mountains, Central Valley and Desert Regions. High-income customers tend to use more electricity compared to the low-income customers. The data agree with this assumption as the combined usage of households in moderate and high-areas is almost four times larger in the summer (five times larger in the winter) than the combined summer usage in very low and low-income areas.

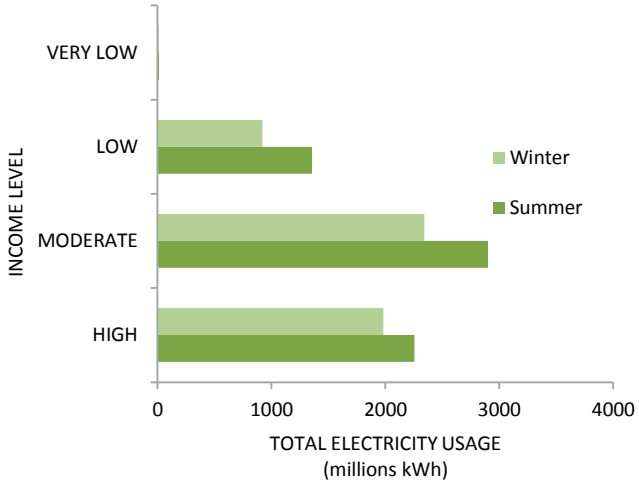
TOTAL USAGE IS HIGHEST IN MODERATE AND HIGH-INCOME AREAS



MAJORITY OF HIGH-INCOME AREAS ARE IN THE CENTRAL AND SOUTH COAST/INLAND REGIONS



TOTAL ELECTRICITY USAGE DIFFERS BY INCOME LEVEL



2. Natural Gas

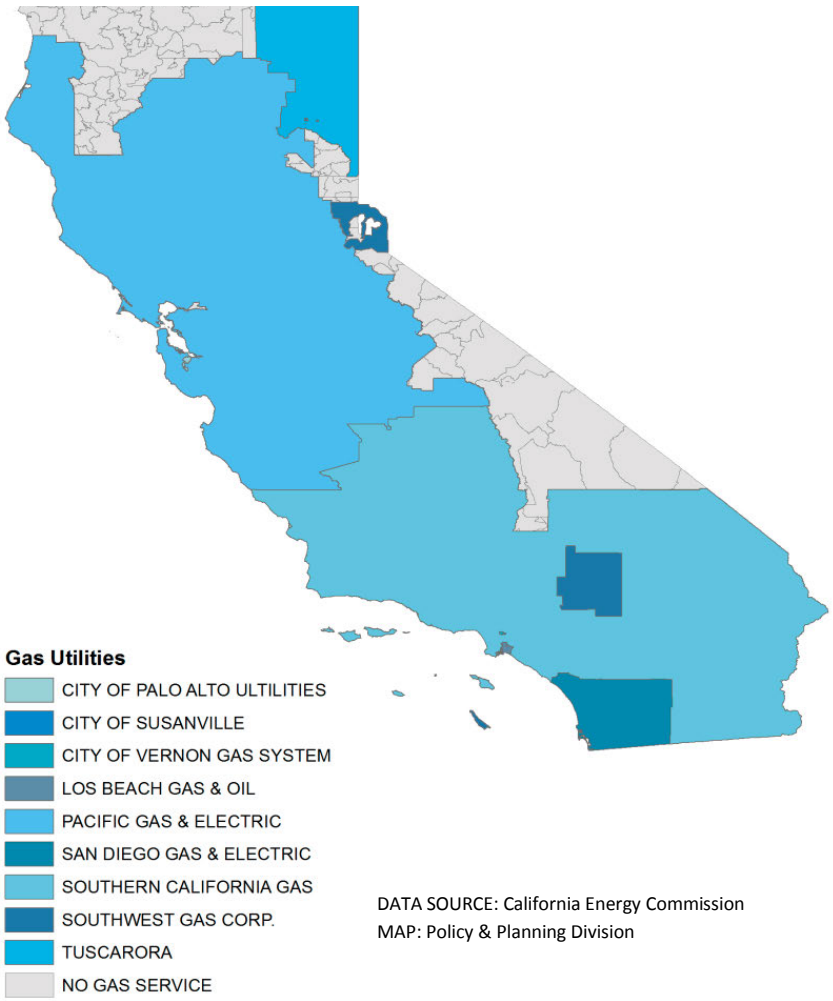
Before looking at the gas utility data trends, it is helpful to note that natural gas service in California does not cover the entire State. Approximately 70% of California is covered by PG&E and SoCalGas, 10% is covered by SDG&E, Southwest Gas, and then there are certain geographical areas that at this point do not have natural gas service. These geographical areas either are not populated or very parsley populated. They rely on either electricity or propane. The eastern part of the North Coast Region and the vast majority of the upper and lower Mountains Region have no gas service.

Average Bill

Overall, the average household gas bill in the summer is $22 and more than double at $48 in the winter. Despite this significant seasonal difference in the cost Californians pay monthly for gas service, these averages are still significantly lower than the gas bills customers pay in many states with more severe climate conditions than California. According to the American Gas Association the average monthly gas bill for the entire country is about $60 per month while California's average is about $40 per month.

After examining the variations within the gas bill data by ZIP code, it is clear that the average summer bills across California range from low to moderate relative to summer bills in other states. Majority of the low-bill areas (less than $15 per month) are in areas in the Central Valley Region, while most of the moderate-bill areas ($15-30 per month) are in the Central Coast and South Coast/Inland Regions.

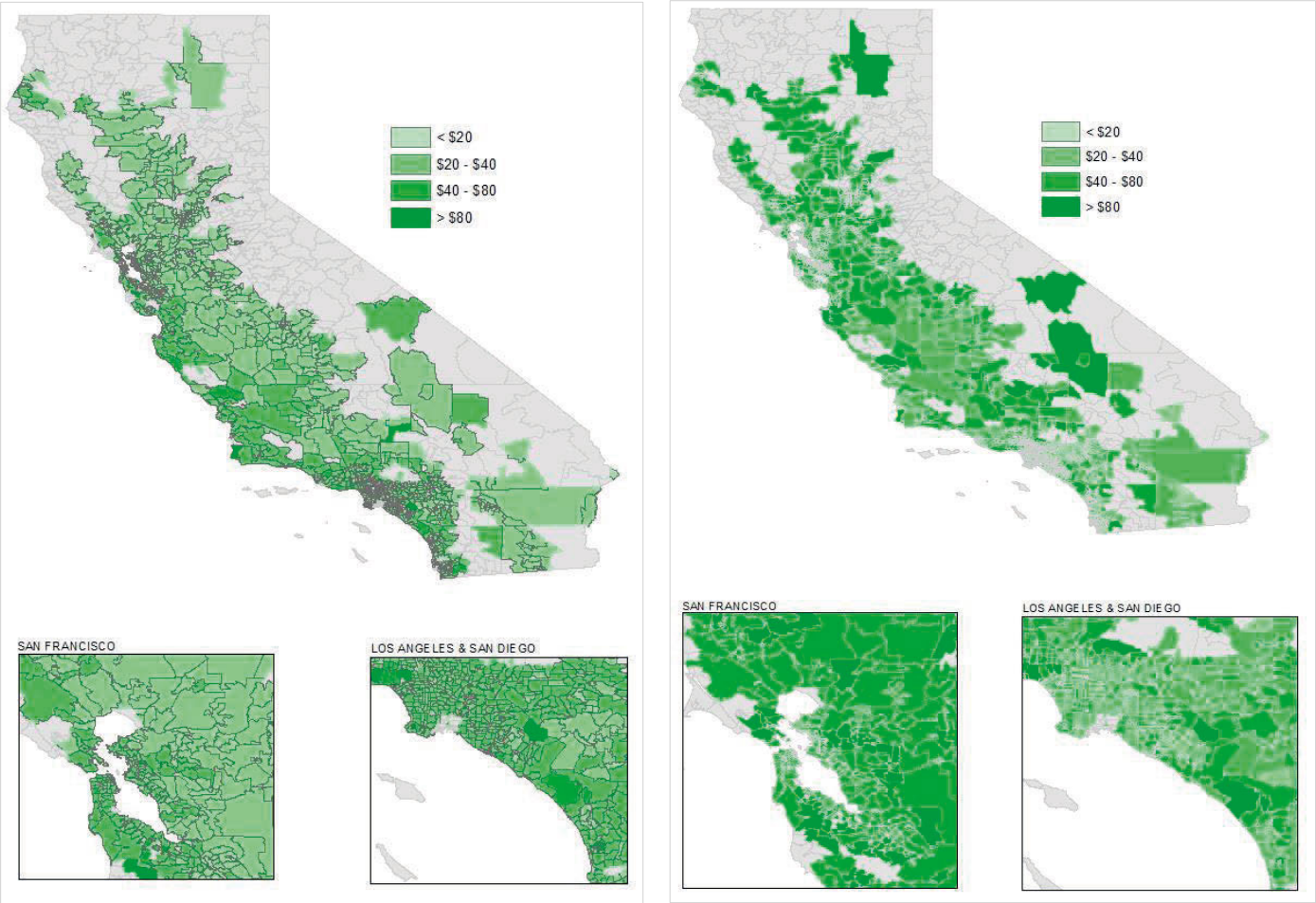
AREAS IN THE NORTH COAST REGION AND MAJORITY OF MOUNTAINS REGION HAVE NO GAS SERVICE



DATA SOURCE: California Energy Commission
MAP: Policy & Planning Division

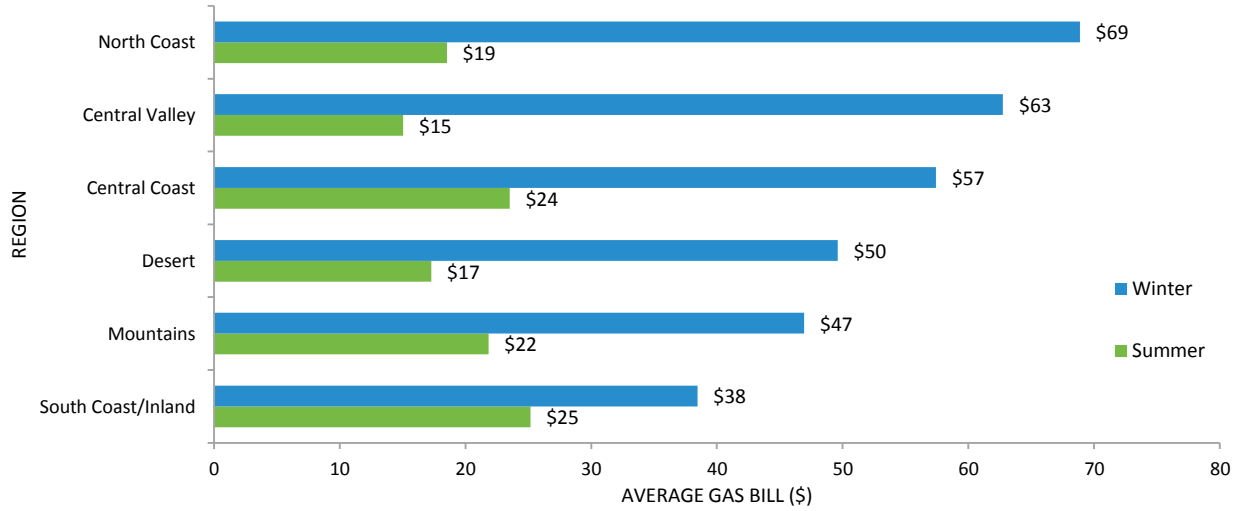
The picture, however, changes dramatically in the winter as average gas bills double during the cold months. Moderate to high bills ($30-80 per month) are registered mostly in areas in the Central Valley and South Coast/Inland Regions. On the other hand, very high bills (more than $80 per month) are mostly in the Central Coast and in some parts of the Mountains, Central Valley and Desert Regions.

AVERAGE GAS BILLS ARE LOW IN SUMMER AND DOUBLED IN WINTER



When the data are aggregated by region and compared by season, we see that gas bills rise steeply from summer to winter. Average winter bills in all regions except South Coast/Inland are more than twice the average summer bills. The percent changes are highest in the Central Valley (320%), North Coast (260%), Desert (195%), and Central Coast (138%).

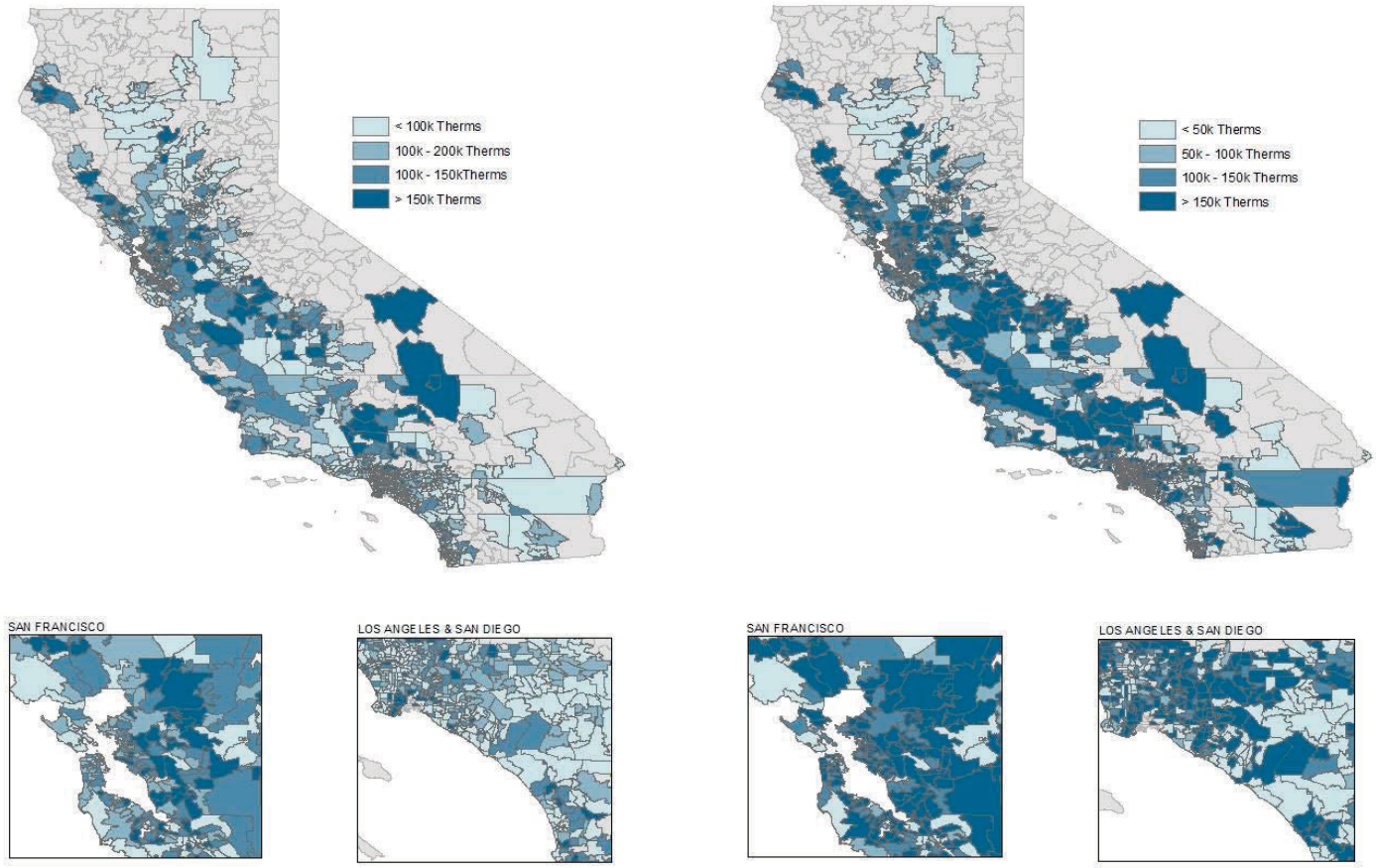
AVERAGE GAS BILLS DIFFER BY REGION AND INCREASE SIGNIFICANTLY IN THE WINTER



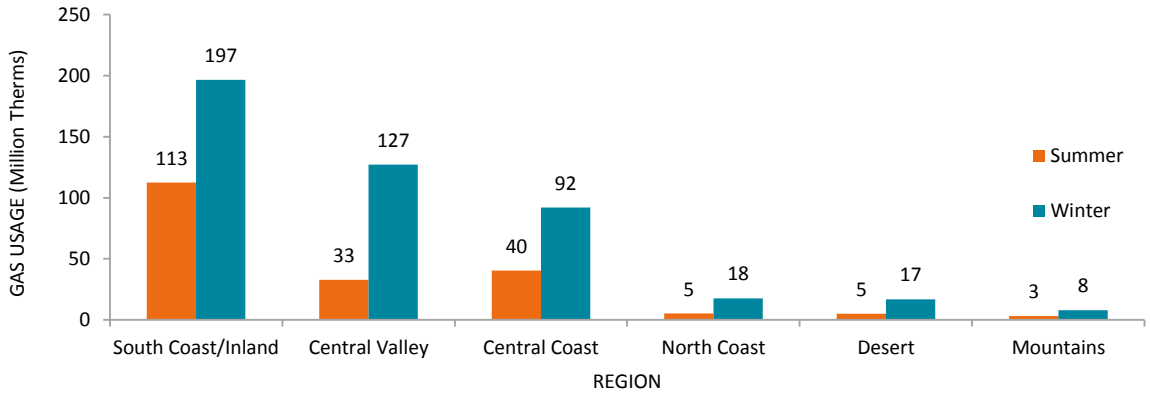
Average Usage

Total gas usage by ZIP code is consistent in the summer across California, ranging from low to moderate. The small number of high-usage areas is heavily concentrated around the state's two largest urban areas: San Francisco and Los Angeles. This trend, however, changes in the winter with total usage increasing in California by 130%: from 188 million therms in summer to 433 million therms in the winter. Total usage increased in almost all of ZIP codes with gas service, and 748 ZIP codes, or 63%, have usage increases of 100% or higher. Most of these ZIP codes are located in Central Valley, Central Coast and South Coast/Inland Regions.

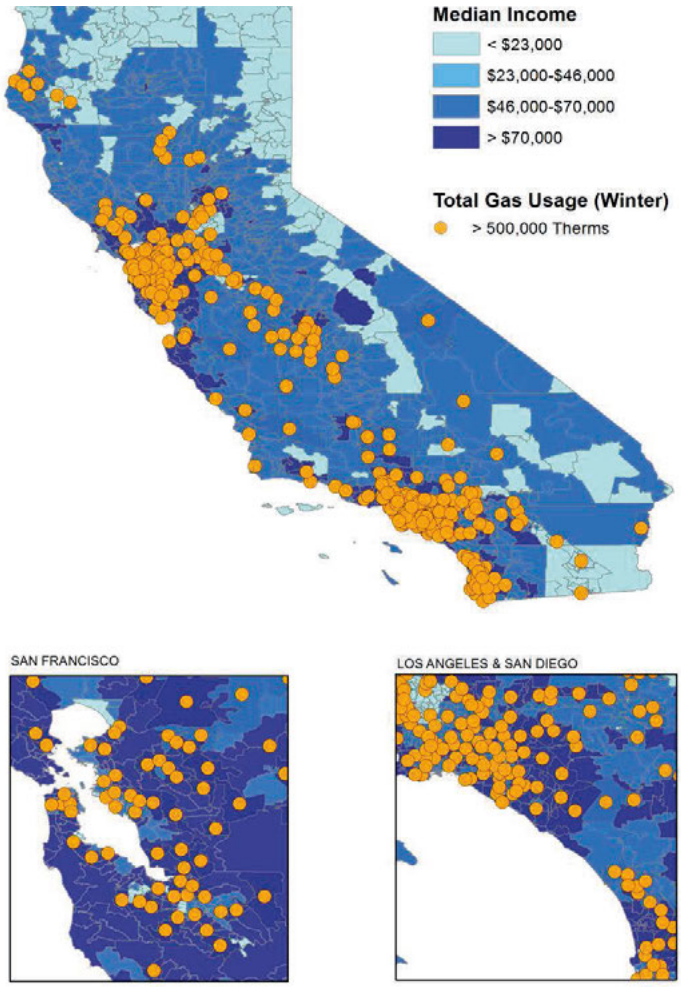
TOTAL GAS USAGE INCREASED IN EVERY ZIP CODE IN THE WINTER



TOTAL GAS USAGE IN SUMMER AND WINTER BY REGION



VERY HIGH-USAGE AREAS ARE ALSO IN HIGH-INCOME URBAN AREAS



Isolating the very high-usage ZIP codes reveals that these areas are concentrated within California's three largest cities: San Francisco, Los Angeles and San Diego. Coincidentally, these ZIP codes are also among the high-income areas in the State. San Francisco has a mild winter climate, and the climate in the Los Angeles and San Diego areas typically ranges from mildly cool to warm in the winter, so determinants other than heating needs could account for the high usage level in these areas.

ZIP CODES WITH THE HIGHEST AVERAGE SUMMER AND WINTER GAS BILLS IN CALIFORNIA

ZIP Code	City	Utility	Average Gas Bill (Summer)
94111	San Francisco	PG&E	$305
90067	Los Angeles	SoCalGas	$210
94105	San Francisco	PG&E	$117
93523	Edwards	SCE	$111
90210	Beverly Hills	SCE	$99
90077	Los Angeles	SoCalGas	$89
90014	Los Angeles	SoCalGas	$87
92067	Rancho Santa Fe	SDG&E	$86
92676	Silverado	SoCalGas	$82
90290	Topanga	SoCalGas	$82
94027	Atherton	PG&E	$78
92101	San Diego	SDG&E	$77
95113	San Jose	PG&E	$67
90265	Malibu	SoCalGas	$65
90272	Pacific Palisades	SoCalGas	$61

ZIP Code	City	Utility	Average Gas Bill (Winter)
94111	San Francisco	PG&E	494.82
90014	Los Angeles	SoCalGas	435.0037
93523	Edwards	PG&E	426.92
90067	Los Angeles	SoCalGas	402.336
95722	Meadow Vista	PG&E	311.69
94105	San Francisco	PG&E	242.72
94027	Atherton	PG&E	219.04
94528	Diablo	PG&E	192.98
94305	Stanford	PG&E	175.91
94507	Alamo	PG&E	168.94
94563	Orinda	PG&E	166.42
90210	Beverly Hills	SoCalGas	145.0621
93953	Pebble Beach	PG&E	140.86
95746	Granite Bay	PG&E	139.6
94556	Moraga	PG&E	138.68

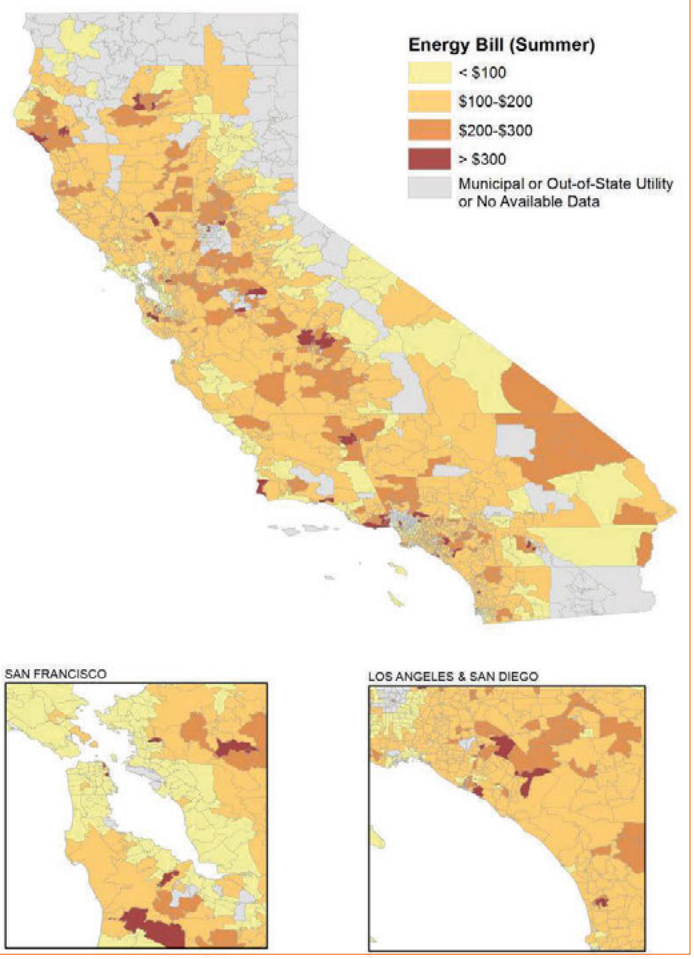
Combined Energy Bills & Low Income Data

Combined Energy Bills: Electricity and Gas

When electric and gas bills are combined, the resulting average energy bills are almost similar in the summer and winter: $141 and $139, respectively. Although the electric expenditures go down significantly in the winter, the very high winter gas bills raise the overall winter energy bills.

However, the energy bill pattern in the summer is much more similar to the electric bill pattern than to the gas pattern. Like electricity, the majority of ZIP codes with the highest energy bills (> $200) are located in the Central Valley and South Coast/Inland Regions. Overall, 90% of California has low to moderate (< $200) energy bills.

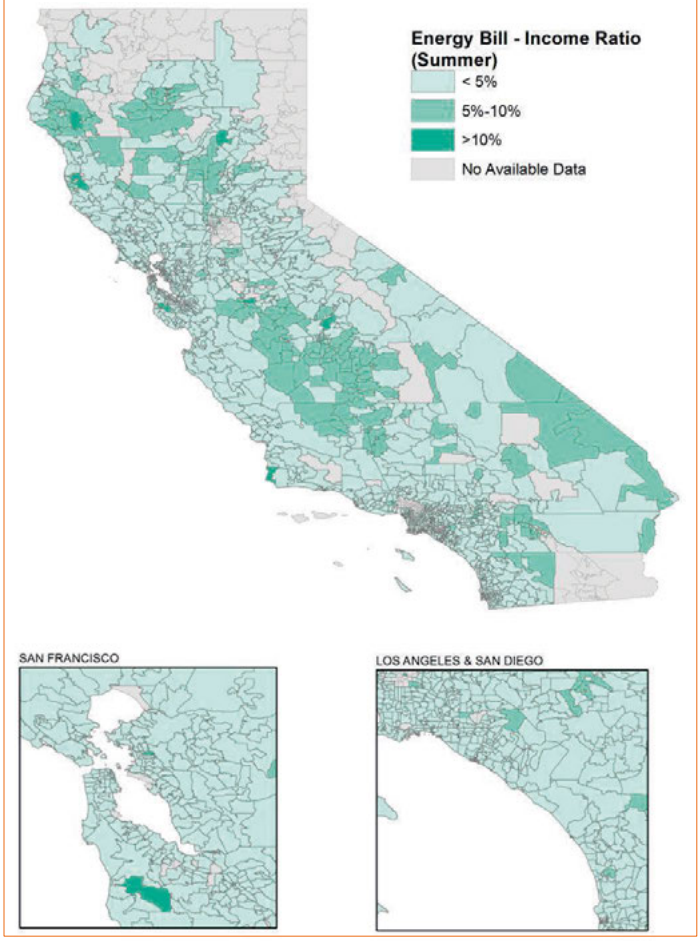
MOST AVERAGE SUMMER ENERGY BILLS RANGE FROM LOW TO MODERATE



Energy Bills as Percentage of Income

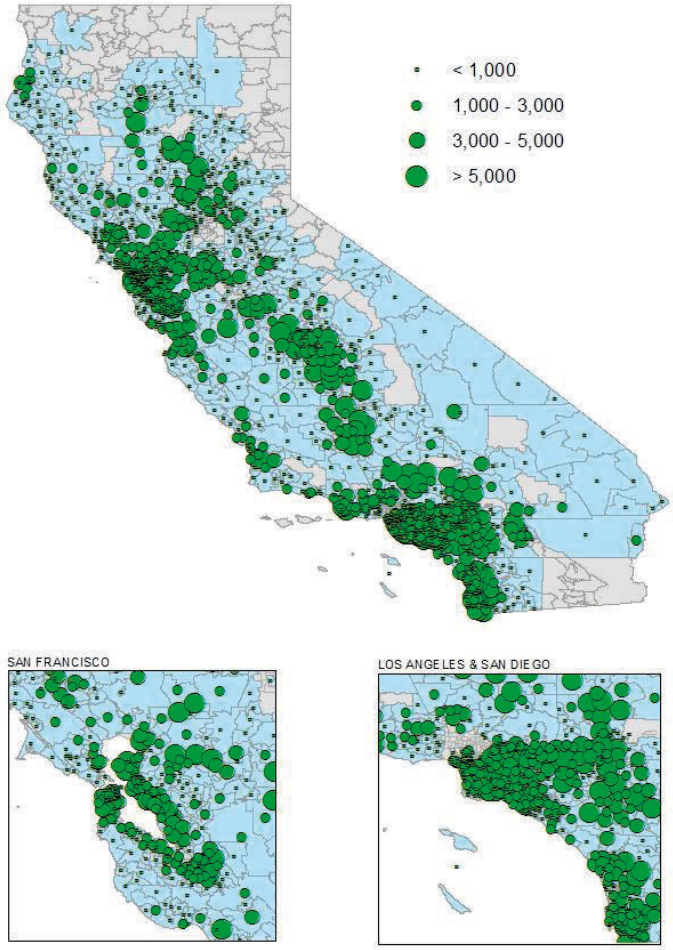
This analysis also examined the ratio of energy bill (combined electric and gas bill) to income, which measures how much of household income is spent on energy bills at the ZIP code level.

THE PERCENTAGE OF INCOME SPENT ON ENERGY BILL REMAINS LOW



Since California has lower energy consumption and bill in general, the energy bill-income ratios are significantly low overall. In the summer, energy bills of the vast majority of California households are only 5% of income or less. The majority of households in ZIP codes that spend more than 5% of their income on energy bills are located in Central Valley, and some in the North Coast, Mountains and Desert Regions. Furthermore, these ZIP codes with ratios higher than 5% are mostly located in low to moderate-income areas of these regions.

LOW-INCOME CUSTOMERS ARE CONCENTRATED IN THE COASTAL AND INLAND AREAS



CARE Customers Ratio

The picture changes when we look at the CARE customers as a percentage of the total customers per ZIP code. There are 463 ZIP codes that have the lowest percentages of CARE customers (<15%). Most of these areas are in the coastal regions of North Coast, Central Coast and South Coast/Inland. The low-CARE areas represent about 12% of the total CARE accounts in the State.

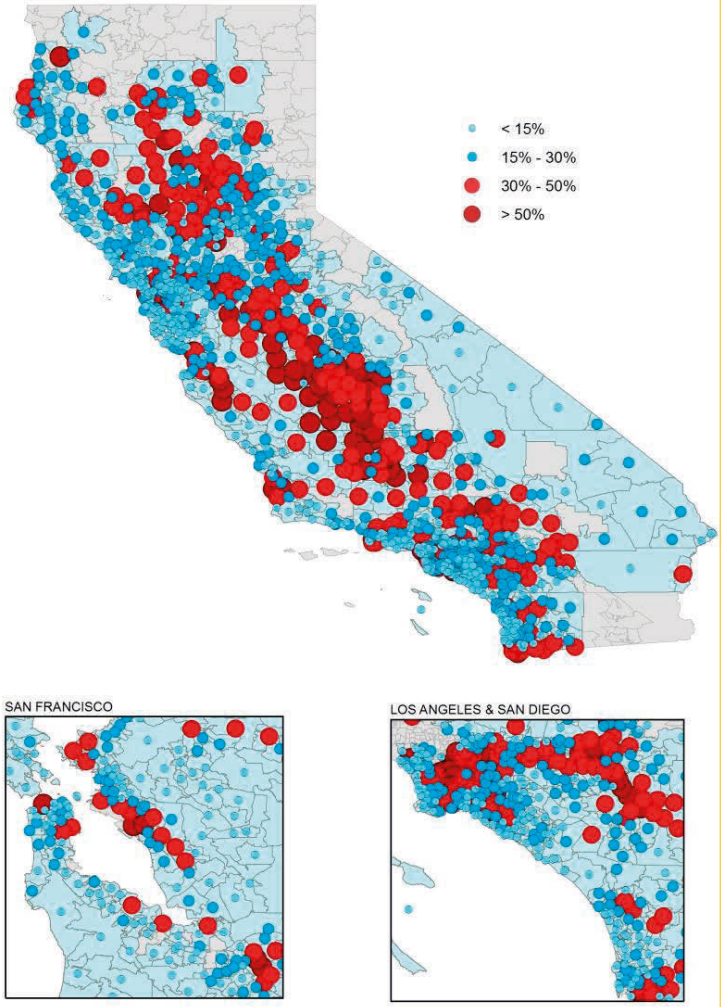
Conversely, the higher percentages of CARE customers (>30%) are located in virtually every region except the western Desert Region. Unlike the low-CARE areas, the high-CARE areas are more concentrated in two regions

Electricity and Gas Low-Income Programs

The density distribution of customers under California's two low-income assistance programs, CARE[3] and FERA[4], shows that most of the low-income customers are located in the upper Central Coast, Central Valley, and South Coast/Inland Regions. The concentration of CARE and FERA households are centered on the State's largest urban areas: Sacramento, San Francisco, Los Angeles and San Diego.

More than half (53%) of the total low-income program customers are in Southern California, and a quarter of them (25%) are in Central Valley. The lowest number of customers under CARE & FERA is in the Mountains and North Coast Regions.

THE HIGHEST PERCENTAGES OF CARE CUSTOMERS ARE IN CENTRAL VALLEY AND SOUTH COAST/INLAND



[3] CARE stands for California Alternate Rates for Energy.
[4] FERA stands for Family Electric Rate Assistance.

only. There are 125 ZIP codes with CARE ratio of more than 50%, which are mostly located in the Central Valley and South Coast/Inland Regions. The highest concentration of CARE customers in California is located in the lower portion of the Central Valley. Overall, the high-CARE areas represent about 19% of the total CARE customers.

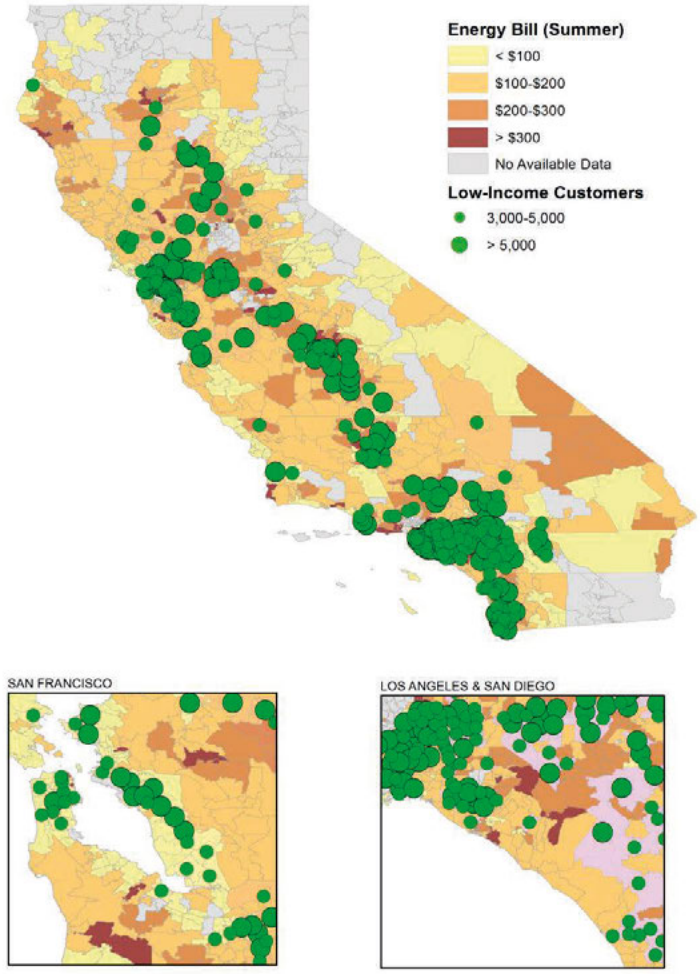
Low-Income Customers and Energy Bills

The analysis also shows that ZIP codes with high average energy bills have also high number of CARE and FERA customers. The high-energy bill (> $200) areas in the Central Valley and South Coast/Inland have at least 3,000 or more low-income program customers.

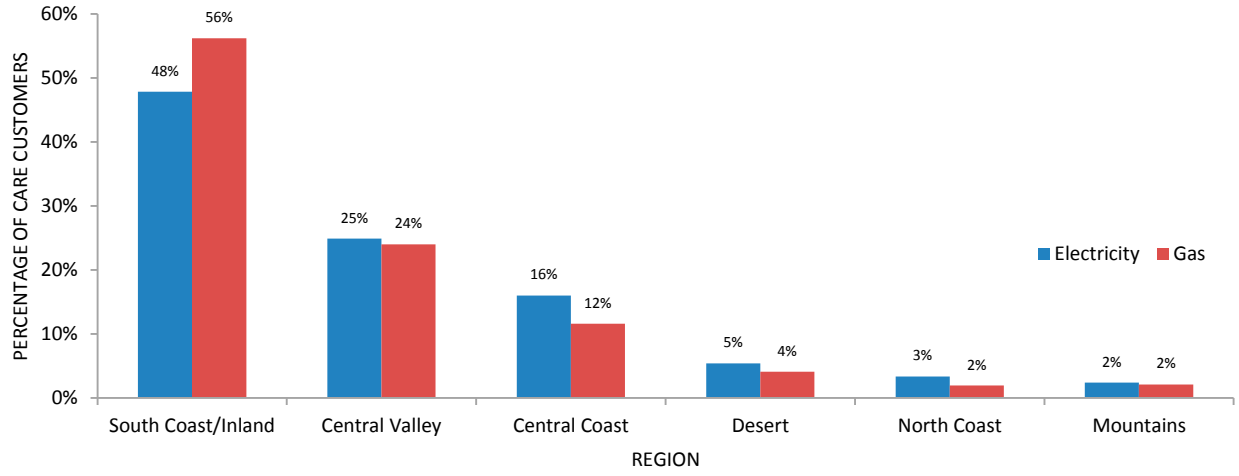
CARE Customers by Region

Looking closely at the CARE data for electricity and gas by region, in the South Coast/Inland Region, 48% of electricity customers and 56% of gas customers are CARE customers. The Central Valley ranks second, with a quarter of electric and gas customers (25% and 24% respectively) being CARE customers. In the Central Coast region, 16% of electricity customers and 12% of gas customers are CARE customers. The lowest percentages of CARE customers in the State are located in the Desert, North Coast and Mountains Regions, where 10% of electricity customers are CARE customers and 8% of gas customers are CARE customers.

HIGH NUMBER OF LOW-INCOME CUSTOMERS ARE ALSO LOCATED HIGH-ENERGY BILL AREAS



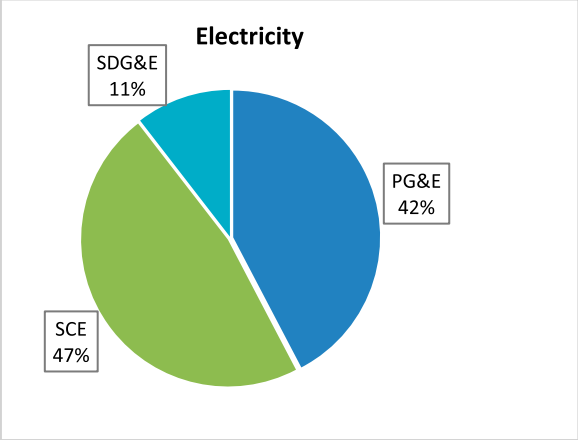
PERCENTAGE OF CARE CUSTOMERS IS HIGHEST IN SOUTH COAST/INLAND AND CENTRAL VALLEY REGIONS

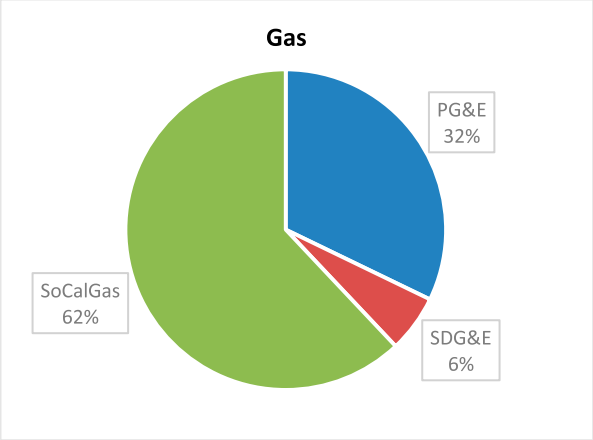


CARE Customers by Utility

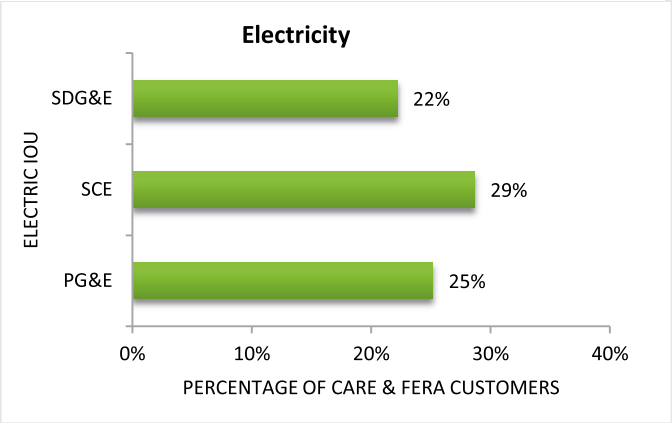
In terms of distribution of low-income electricity customers by utility, 47% of CARE and FERA customers are in the Edison territory, while 42% are located within the PG&E service area, and 11% within the SDG&E service area. For gas, 62% of CARE customers are serviced by SoCalGas, 32% by PG&E and 6% by SDG&E.

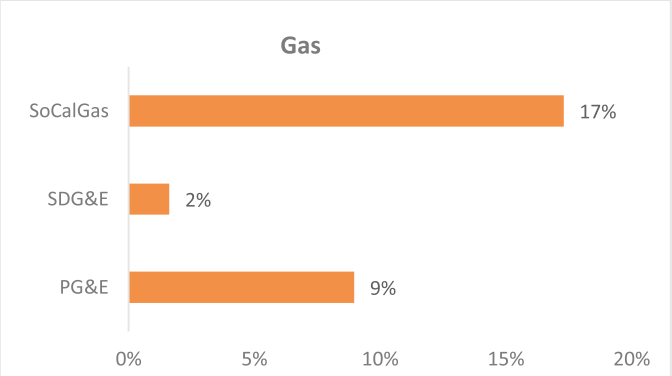
LOW-INCOME ELECTRICITY AND GAS CUSTOMERS BY UTILITY





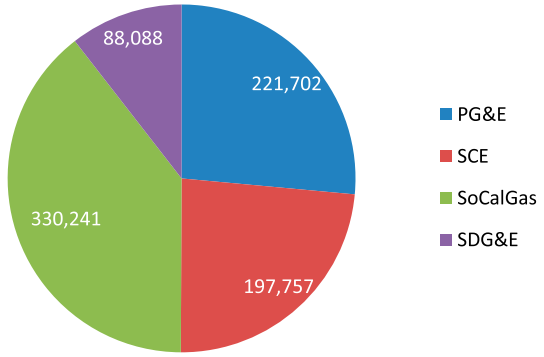
LOW-INCOME CUSTOMERS BY UTILITY AS A PERCENTAGE OF THE TOTAL LOW-INCOME CUSTOMERS IN THE STATE





Overall, the ratio of the utility's low-income program customers to its respective total electricity customers is modest, ranging from 22%-29% for electricity. These values are much lower for gas, with 17% for SoCalGas, 9% for PG&E and only 2% for SDG&E. These numbers could be higher if the current unenrolled eligible CARE customers totaling 838,000 become part of the program. It would be interesting to see where these potential CARE customers are located, and how they would affect the current trends presented in this analysis.

UNENROLLED ELIGIBLE CARE CUSTOMERS



SOURCE: CPUC, 2015 Monthly CARE/ESA Reports.

3. Water

Average Bill & Usage

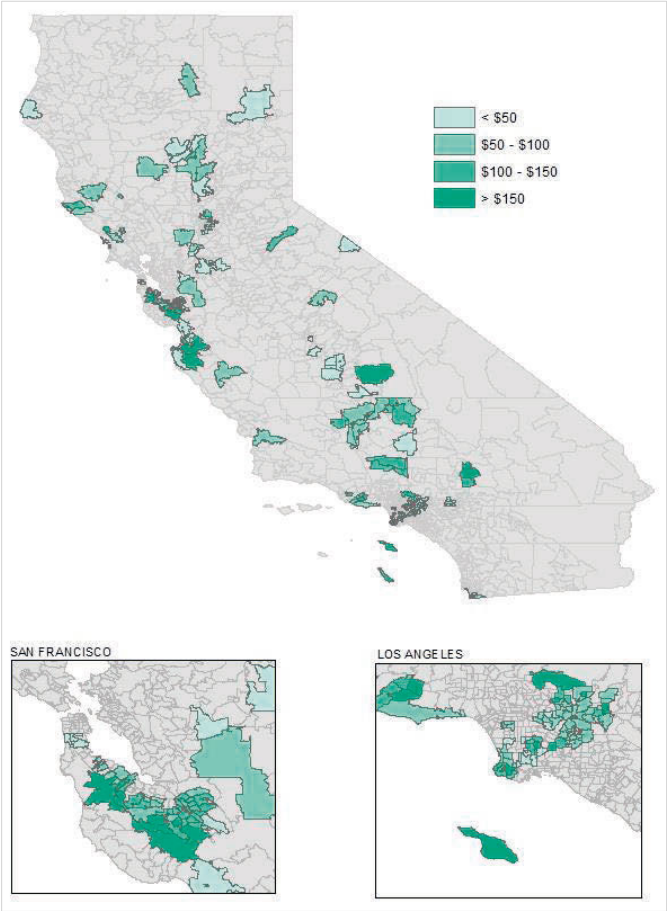
California is in the 4th year of a severe drought. To address the need to conserve potable water California policy makers are undertaking several actions that will incentivize conservation. On April 1, 2015 Governor Brown issued an executive order which among other directives asked the Water Board and the CPUC to direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions.

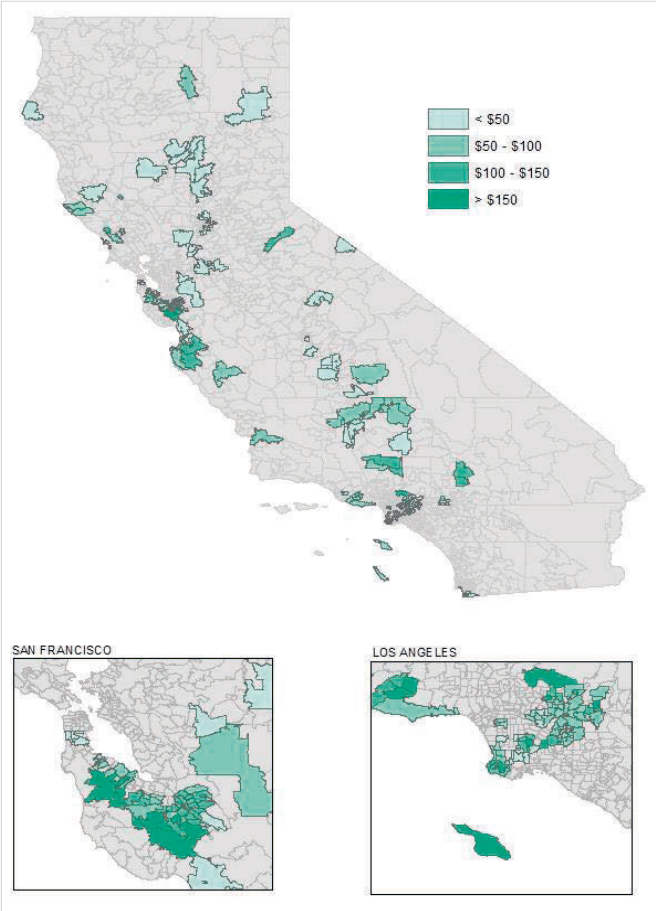
The scarcity of water data in this analysis is due to the fact that the CPUC regulates only 113 water utilities, which provide water service to approximately 16% of the state's population. Approximately 95 percent of that total is served by 9 large water utilities each serving more than 10,000 connections.[5] Annual water and wastewater revenues under the CPUC's regulation total $1.4 billion. This represents a very small portion of the State, which is 231 ZIP codes or about 1.4 million water customers. As the maps show, the missing bill and usage data pose a difficulty as we cannot fully assess the overall state of water utilities without the data from the remaining 84% of utilities.

Like electricity, water bills are higher in the summer than in the winter, but only by small amount. The average bill in areas under CPUC-regulated water utilities is $78 in the summer and $60 in the winter. During summer and winter, the majority of the high-bill ZIP codes are located around the South Bay Area in the Central Coast and a small area around the Los Angeles Area in the South Coast/Inland.

[5] The water data were obtained from 9 Class A, 4 Class B, and 24 Class C water utility companies.

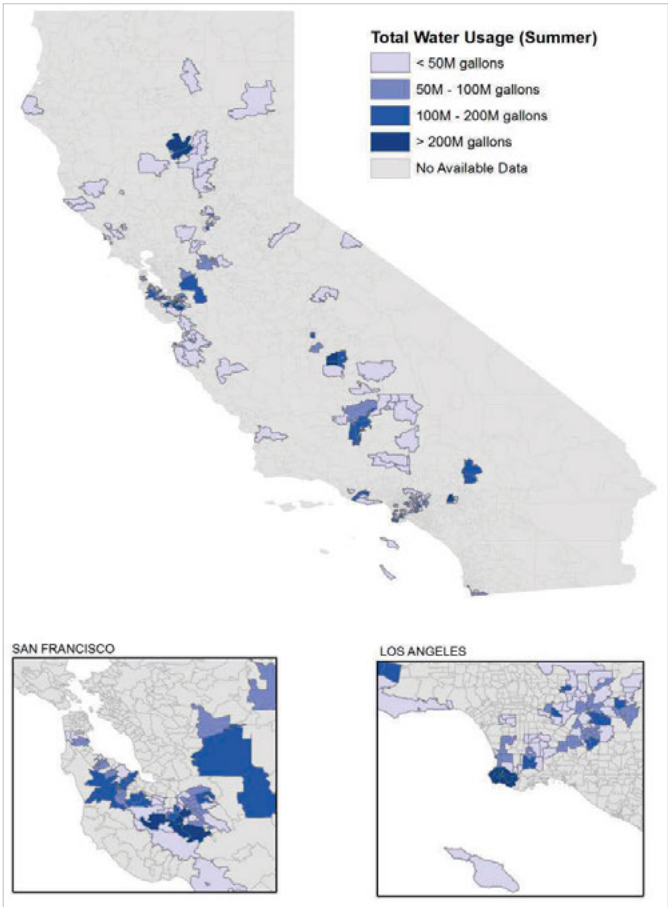
AVERAGE WATER BILLS IN CPUC-REGULATED UTILITIES ARE MODERATE IN BOTH SUMMER AND WINTER

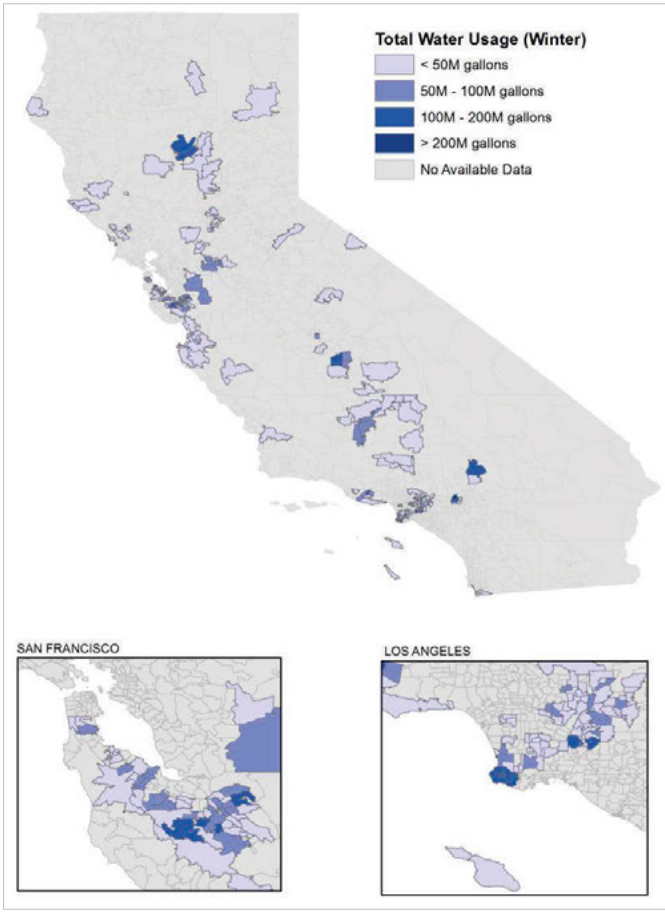




Looking at water usage is of particular importance today as California faces a historic drought. In 2014, water usage in the CPUC-regulated utilities decreased by 40% from 13 billion gallons in the summer to 8 billion gallons in the winter. The average usage in the summer is 10,896 gallons and 6,528 gallons in the winter. Overall, the total water usage ranges from low to moderate, with 59% of the ZIP codes (137) in summer and 73% (169) in winter using less than 50 million gallons.

AVERAGE WATER USAGE IN CPUC-REGULATED UTILITIES IS MODEST IN BOTH SUMMER AND WINTER



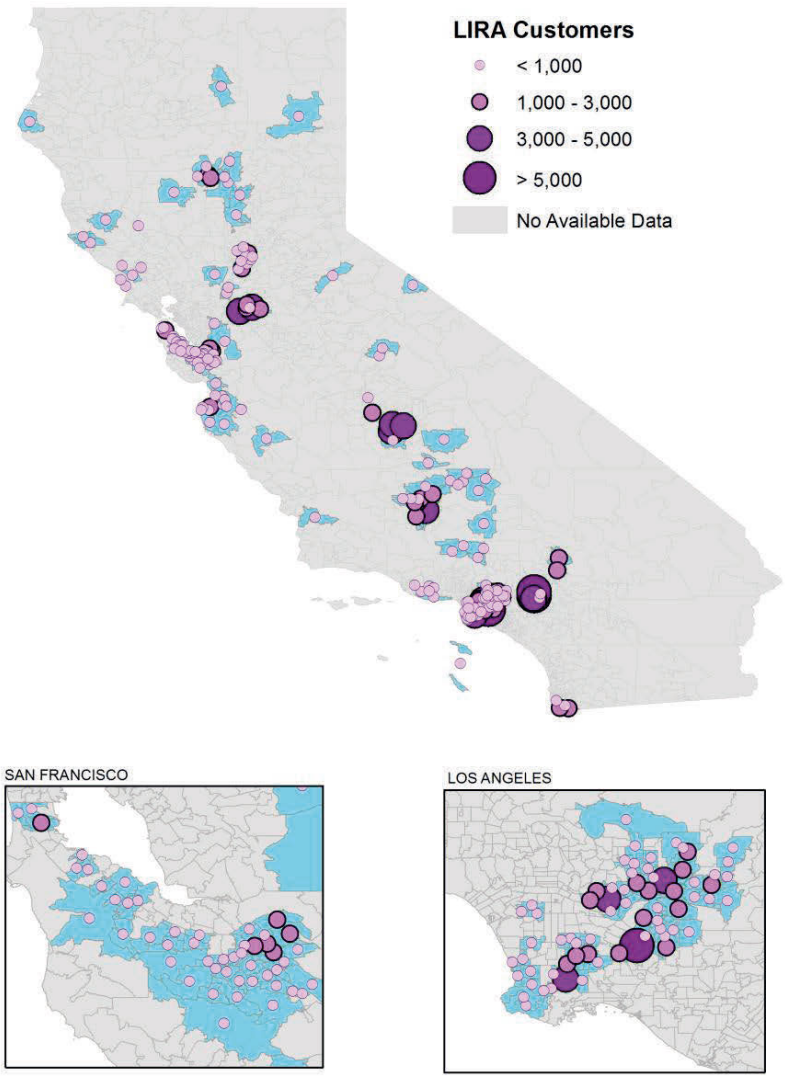


ZIP CODES WITH THE HIGHEST AVERAGE SUMMER AND WINTER WATER BILLS IN CPUC-REGULATED AREAS

ZIP Code	City	Utility	Average Summer Bill
91008	Duarte	California American Water	$433
94027	Atherton	California Water Service	$367
93953	Pebble Beach	California American Water	$309
94062	Redwood City	California Water Service	$292
95030	Los Gatos	San Jose Water	$261
95070	Saratoga	San Jose Water	$261
91361	Westlake Village	California American Water	$228
91362	Thousand Oaks	California Water Service	$226
90704	Avalon	SCE Catalina Water	$214
95446	Guerneville	California Water Service	$211
94028	Portola Valley	California Water Service	$209
95458	Lucerne	California Water Service	$208
91108	San Marino	California American Water	$202
95120	San Jose	San Jose Water	$201
93010	Camarillo	California American Water	$197

ZIP Code	City	Utility	Average Winter Bill
95030	Los Gatos	San Jose Water	234.04
91008	Duarte	California American Water	220.19
95032	Los Gatos	San Jose Water	189.84
94027	Atherton	California Water Service	174.12
95458	Lucerne	California Water Service	168.4
95446	Guerneville	California Water Service	167.54
91362	Thousand Oaks	California Water Service	159.65
95120	San Jose	San Jose Water	155.84
91011	La Canada Flintridge	Mesa Crest Water	150.36
95117	San Jose	San Jose Water	144.18
95125	San Jose	San Jose Water	138.76
95008	Campbell	San Jose Water	138.26
95116	San Jose	San Jose Water	138.08
95126	San Jose	San Jose Water	137.77
95129	San Jose	San Jose Water	137.71

AREAS WITH MORE THAN 3,000 WATER LOW-INCOME CUSTOMERS



Water Low-Income Program

In terms of water low-income programs, there are approximately 180,000 LIRA (Low-Income Rate Assistance) customers, or about 15% of the total water customers in the CPUC-regulated utilities. Although there are low-income customers in all ZIP codes, most of the LIRA customers are under the large water utilities (Class A). The largest numbers of LIRA customers are serviced by San Gabriel Valley Water, California Water Service, Park Water, Apple Valley Ranchos and California America Water. Specifically, areas with more than 3,000 LIRA customers are in the cities of Stockton, Visalia, Bakersfield, Fontana, and in the Greater Los Angeles areas of Norwalk, El Monte and Carson.

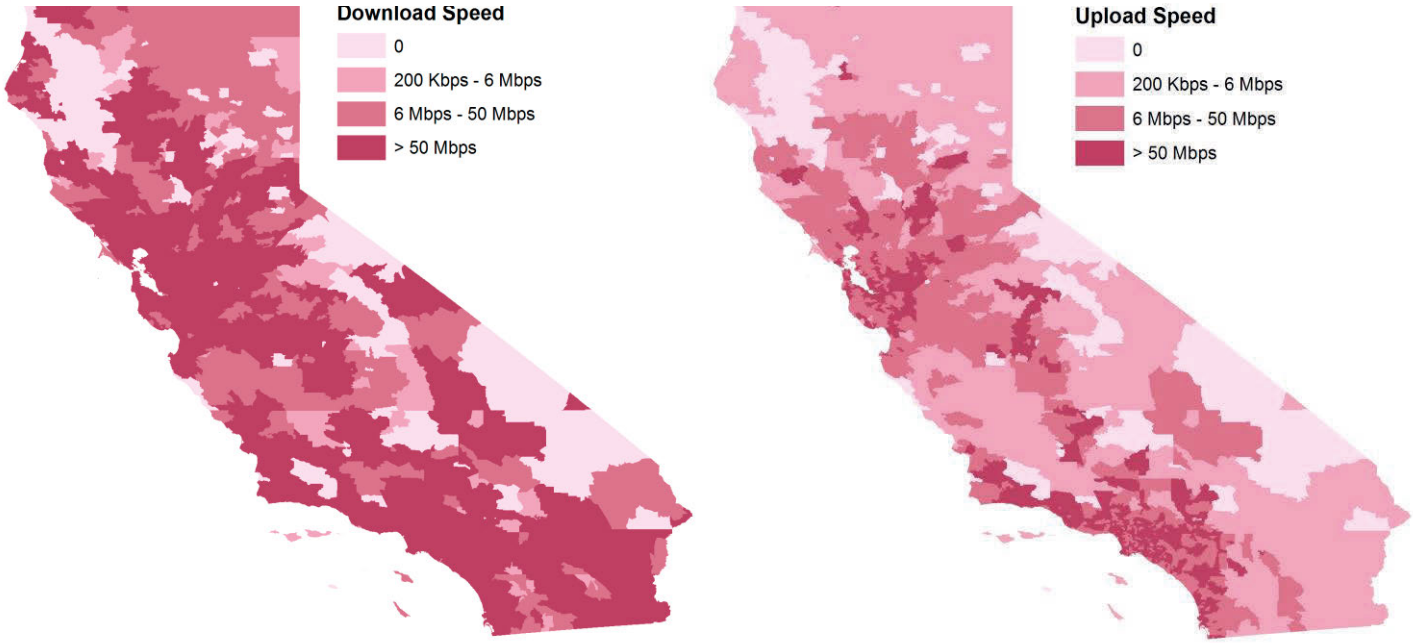
4. Broadband

Advertised Download & Upload Speeds

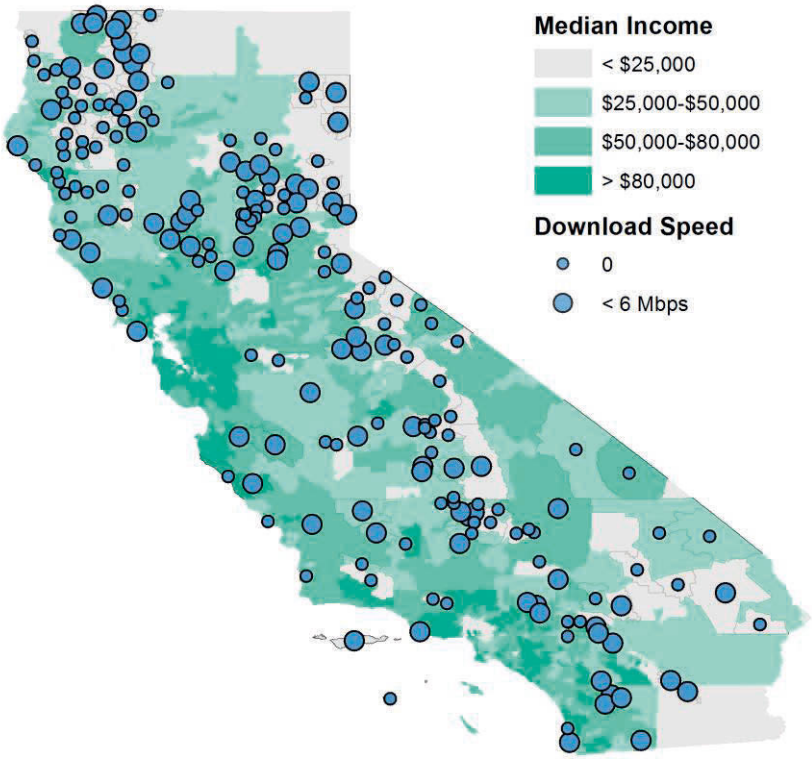
The data show that wired broadband in California covers about 95.5% of the State's total households, while the remaining 2.1% is underserved and 2.4% is currently unserved. In total there are 102 broadband providers in California. There are about 1.7 million people in California that have access to only one wired provider. And, finally California is the 11th most connected State.[6] Using the CPUC's definition of 6 megabits per second downstream and 1.5 megabits per second upstream, roughly 4.5% of California's households remain underserved or unserved. That equates to roughly 36% of land area, while another 55% remains unpopulated, according to the 2010 Census. The majority of the underserved and unserved areas are located in the most rural parts of the North Coast, Mountains, and Desert Regions of California.

The fastest download and upload advertised speeds in the State are located around the most urban areas: Sacramento, San Francisco, Los Angeles, and San Diego. It is important to note that this data is based on advertised speeds and not actual speeds available to residents. The next update to this report will have the actual speeds per zip code. We wanted to make the distinction between advertised and actual, and also allow consumers to understand the distinction.

MAXIMUM BROADBAND DOWNLOAD AND UPLOAD SPEEDS ARE FASTEST AROUND URBAN AREAS



WIRELINE BROADBAND UNSERVED AND UNDERSERVED AREAS ARE ALSO IN LOW-INCOME AREAS



Broadband Availability and Income Level

If we examine closely the areas with no broadband service or slower connection speeds, we find that these areas are also mostly low-income areas. Most of the unserved ZIP codes are located in the low-income areas in the North Coast, central and lower Mountains, lower Central Valley and Desert Regions.

Similarly, the underserved areas, where download speed is slower than 6 Mbps and upload speed is slower than 1.5 Mbps, are also located in the low-income parts of these regions.

It is also interesting to see that there are still underserved and unserved areas in the more developed parts of California.

TOP 20 ZIP CODES IN CALIFORNIA WITH UNDERSERVED WIRELINE BROADBAND SERVICE

Rank	ZIP Code	City	Population	Download	Upload
1	95321	Groveland	3,909	< 1.5 Mbps	< 768 Kbps
2	93675	Squaw Valley	3,767	< 1.5 Mbps	< 768 Kbps
3	95311	Coulterville	2,510	< 1.5 Mbps	< 768 Kbps
4	95469	Potter Valley	1,644	< 1.5 Mbps	< 768 Kbps
5	91905	Boulevard	1,638	< 1.5 Mbps	< 768 Kbps
6	95389	Yosemite Natl Park	1,392	< 1.5 Mbps	< 768 Kbps
7	92066	Ranchita	979	< 1.5 Mbps	< 768 Kbps
8	96047	Igo	803	< 1.5 Mbps	< 768 Kbps
9	95335	Long Barn	489	< 1.5 Mbps	< 768 Kbps
10	93925	Chualar	379	< 1.5 Mbps	< 768 Kbps
11	93652	Raisin City	367	< 1.5 Mbps	< 768 Kbps
12	95956	Meadow Valley	361	< 1.5 Mbps	< 768 Kbps
13	95941	Forbestown	289	< 1.5 Mbps	< 768 Kbps
14	96125	Sierra City	242	< 1.5 Mbps	< 768 Kbps
15	95984	Twain	143	< 1.5 Mbps	< 768 Kbps
16	92070	Santa Ysabel	1,369	< 3 Mbps	< 768 Kbps
17	93247	Lindsay	17,539	< 6 Mbps	< 1.5 Mbps
18	92342	Helendale	6,380	< 6 Mbps	< 1.5 Mbps
19	93240	Lake Isabella	6,021	< 6 Mbps	< 3 Mbps
20	93267	Strathmore	6,007	< 6 Mbps	< 1.5 Mbps

TOP 20 ZIP CODES IN CALIFORNIA WITH NO WIRELINE BROADBAND SERVICE

Rank	ZIP Code	City	Population
1	92356	Lucerne Valley	6501
2	93737	Fresno	3693
3	95454	Laytonville	2893
4	95428	Covelo	2524
5	95573	Willow Creek	2492
6	93516	Boron	2304
7	95546	Hoopa	2202
8	92341	Green Valley Lake	2007
9	93283	Weldon	1946
10	95919	Brownsville	1795
11	92391	Twin Peaks	1764
12	95916	Berry Creek	1477
13	95589	Whitethorn	1383
14	93608	Cantua Creek	1371
15	93920	Big Sur	1324
16	93518	Caliente	1164
17	95385	Vernalis	1059
18	95563	Salyer	999
19	95645	Knights Landing	921
20	93238	Kernville	856

Data Gaps

This analysis examined bill and usage data at the ZIP code level to assess the state of California's public utilities—electricity, gas, water and broadband—in terms of how much consumers pay for these basic necessities and how much they use each utility service. The ZIP code level data provided a very detailed geographical aggregation of customer bill and usage information, which in turn allowed us to map a clearer and more complete picture of the trends and patterns within the cost and consumption data in California. Like any other analysis, however, there are areas that deserve further exploration and work in order to fully assess the state of every utility.

- **Explore ways to gather additional data for natural gas use by consumers with different incomes and living in different climate regions.**
  Electricity information is more readily available. The challenge for the next version of this report will be to gather and showcase the same level of data for consumers with respect to natural gas. For instance, the next version of the report should include natural gas usage by climate regions and also a comparison of income versus consumption.

- **Explore ways to gather bill and usage data from water utilities not regulated by CPUC.**
  The limited water data analyzed in this analysis do not provide full and complete insight into the state of water utilities in terms of cost and usage. Among the water utilities CPUC regulates, the average summer and winter bills are moderate. However, we cannot extrapolate this finding to the entire state without data from water utilities not regulated by the CPUC to complete the picture. Working with CPUC's Water Division, and partnering with other state agencies like the State Water Resources Control Board (SWRCB), Department of Water Resources, and others would be a valuable effort in the collection of the missing ZIP code level data from all water utilities.

- **Add broadband bill and usage information to the download and upload speed data.**
  Unlike the electricity, gas and water data, the broadband data in this analysis included only advertised speed, and not actual speed, bill and usage data. Knowing the status of advertised broadband speeds across California is beneficial, but it is also equally important to examine the actual speed being delivered to most customers, and the cost customers pay for basic broadband service as well as their usage level. Therefore, requesting these data from the service providers would be very helpful in assessing affordability and availability of broadband service in the State.

- **Integrate past and future data.**
  One limitation of this analysis is that the data only represent year 2014, and therefore it is impossible to deduce previous trends and difficult to forecast future trends. Collecting time series data that span at least 10 years back and continue to the most current year would offer a better analysis and understanding of utility data.

In addition to this report, an interactive map is also developed to present the complex utility data analyzed in this report in a straightforward and user-friendly format. The interactive map contains the same data examined in this analysis, and allows users to zoom in to their respective ZIP codes to view available utility data for that specific area. The interactive map is designed to tell a story about each utility and explain the important issues related to it in the most simple and visual way. The interactive map is in its most nascent stage and requires continuing development and maintenance to fully achieve its purpose.

- **Continue to develop and maintain the interactive map.**
  The State of Public Necessities Interactive Map serves as a useful tool for public information and utility regulation. It aims to provide Californians utility data that would help them understand utility issues in a simple, intuitive and interactive format. Moreover, it aims to inform and guide policy and decision-making in the Commission. With these benefits, it is important that the Commission look at the viability of maintaining and further developing the existing interactive map as a permanent resource and tool. Collecting time series data for other utility-related variables at the ZIP code level would be a good place to start. Complex and technology-based tools like this usually require considerable time and technical skills, so looking at the resources and logistical aspects is another important area to think about. In this advanced and modern time, however, data collection and visualization have become integral parts of successful private and public organizations. It is therefore imperative that the Commission explore more avenues to become a more data-driven and data-based organization, and developing this interactive map is one way to achieve this goal.

- **Promote the interactive map as a tool of public information and utility regulation.**
  Developing an interactive tool is a great initiative, but it is also equally important to inform the public about where to find the tool, how to use it, and what you can learn from it. There are already useful tools like this interactive map in the Commission, but they are not widely used because they are either too complicated to use or unknown to most people. One key part to the success of the interactive map is a publicity and information campaign that would introduce its concept and promote its importance both publicly and internally.