

THE CITY OF SANTA BARBARA

ANNUAL ENERGY REPORT 2018



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April, 2019

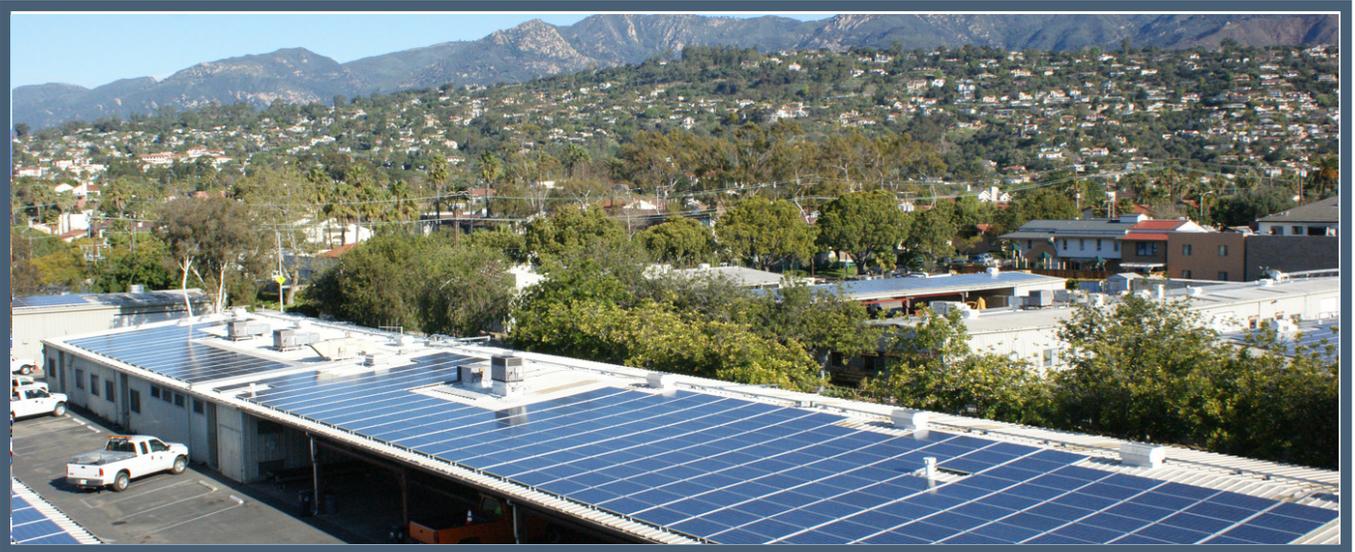


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ANNUAL ENERGY REPORT

2018



WHAT'S NEW IN ENERGY AT THE CITY:

- Strategic Energy Plan
- New solar arrays in design
- Reclaim renewable energy at El Estero
- New and Improved Streetlights

INTRO TO THE YEAR

A Year of Strategic Planning

The City's energy team has been busy this year working on a robust strategic energy plan that will guide the City toward achieving its ambitious 100% renewable electricity by 2030 goal. This big, bold goal will require an equally ambitious approach, which will be outlined in the Strategic Energy Plan, coming out in the summer of 2019.

Additionally, the City has been prioritizing renewable energy on the roofs of municipal buildings as part of its standard building renewal process. Several buildings were bid out for solar in 2018, including Fire Stations 4 & 5 and the Eastside Library. These systems will be constructed in 2019 and will add to the City's renewable energy portfolio.

Energy Efficiency continues to be a priority for the City. In that spirit all City-owned, low voltage streetlights were upgraded to high efficiency LED fixtures. The City worked with Southern California Edison to upgrade all of the SCE-owned fixtures as well. In all, approximately 3,500 Streetlights were upgraded.

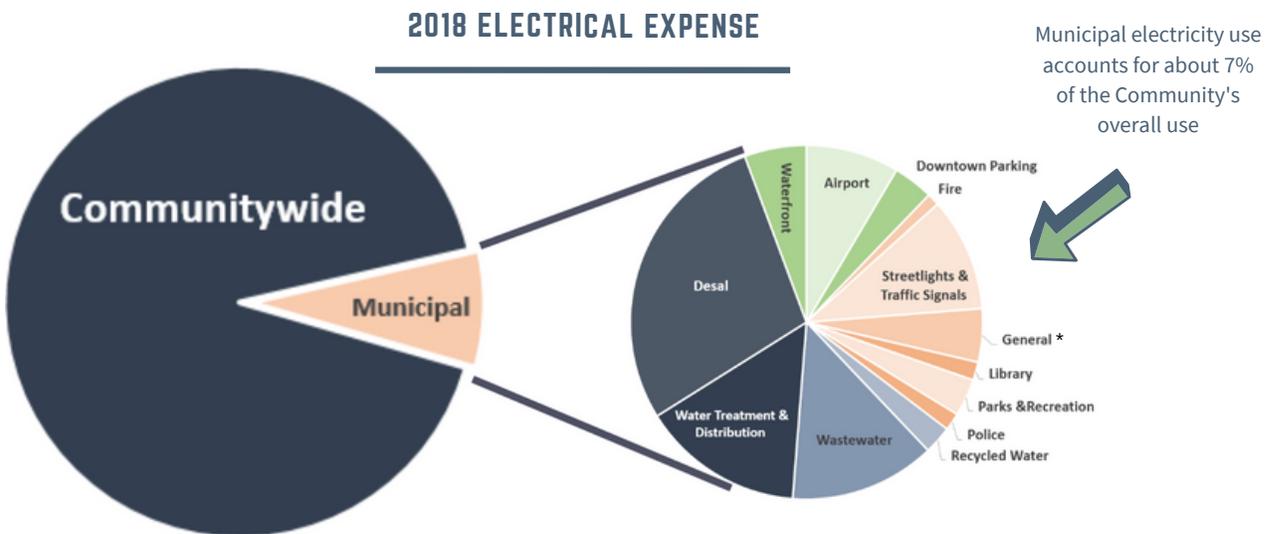
ELECTRICITY



ELECTRICAL EXPENSE

In 2018 the City spent \$4.52 Million on electricity, this is about 25% higher than last year. The primary reason for this increase is the significant increase in electricity used to produce water for the City through the Desalination Plant.

Electrical rates have been increasing at an average rate of 3% per year since the inception of the City's energy program. This means that even when the City is successful in reducing energy used in operations, costs often continue to increase. The City's work in energy efficiency greatly helps mitigate these cost increases.



Municipal electrical use accounts for approximately 8% of the Santa Barbara community's overall electrical use. This chart shows how that 8% is broken down by City department or division. It is important to note that even though water and wastewater treatment appear to be a large portion of the municipal pie it only accounts for about 4% of the community's overall electrical use, while supplying 100% of the community's water!

PURCHASED ELECTRICITY

The City used over 40 Million kWh in 2018, equivalent to about 6,000 homes. This is an 44% increase over last year. As with the electrical expenses section, this increase was largely driven by the increase in water output at the desalination plant. Desal water has become an integral part of Santa Barbara's water supply, providing water security in times of extreme drought, but this process is also very energy intensive. The City is currently exploring ways to offset this increased electrical usage with innovative renewable technologies.

Other than the desal plant, the majority of the electrical load stayed the same as compared to 2017. The most notable increases occurred at the Airport Terminal, which increased 770,000 kWh (6%) due to an increase in passenger traffic and Pershing Park (20% increase) due to increased recreational usage during the winter months - which is a great reason to have an electrical increase!

The largest electrical decrease in 2018 was due to the resting of the groundwater wells. Santa Barbara had enough surface water supply during this year to stop using the groundwater wells and allow them to begin replenishing themselves. Overall, the electrical decrease at the groundwater wells was 2.84 Million kWh, or 85% less electricity used. This groundwater wells are able to get this much needed rest as a result of the Desal facility producing a portion of the City's water supply.

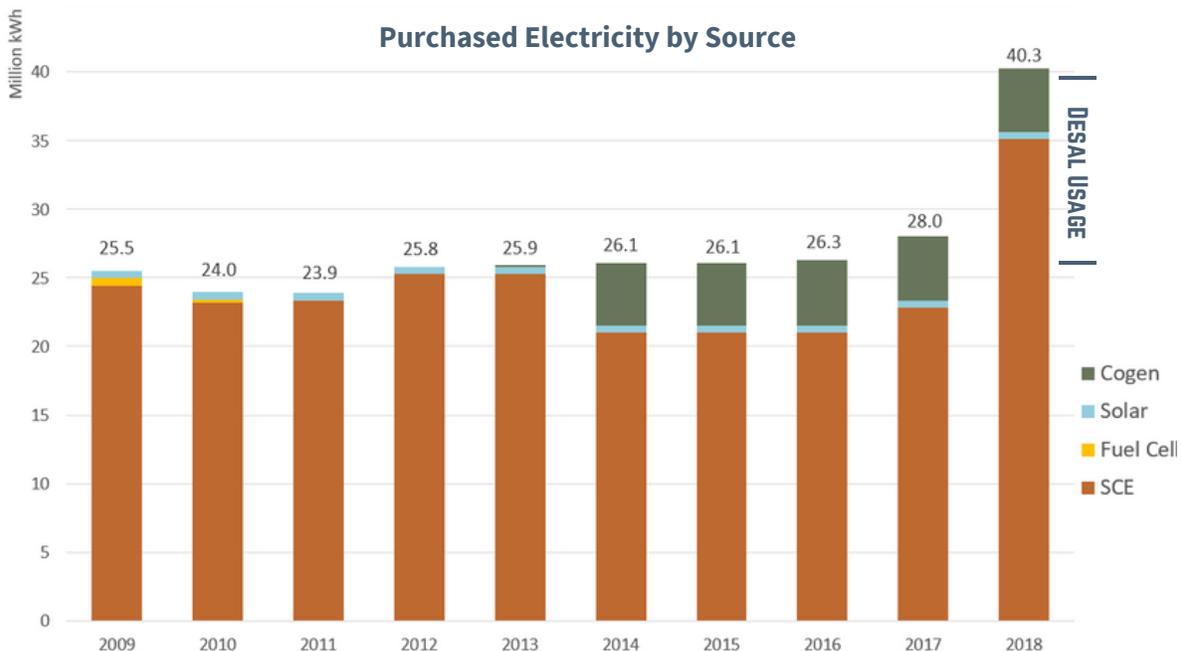
Additionally, the City was able to take advantage of an SCE program called direct install, where SCE replaces certain types of lighting with high efficiency LED fixtures, free of charge. These lighting upgrades contributed to significant electrical use decreases at buildings such as the Police Station (21% decrease) and 630 Garden St (25% decrease).

DESALINATION

The Charles E. Meyer Desalination Plant produces three million gallons of drinking water per day, about 30% of the City's demand.

Though the desalination process is very energy intensive the City endeavored to make the system as energy efficient as possible. The new and improved plan uses 40% less energy than the original design, greatly reducing its electricity demand and carbon footprint, by using high-efficiency pumps, motors and improved filter technology.

Even with these efforts, desal has increase electricity usage at the City by approximately 45%. The City is currently exploring opportunities to offset this electrical increase by adding distributed energy resources such as solar and storage at other water facilities.



NATURAL GAS

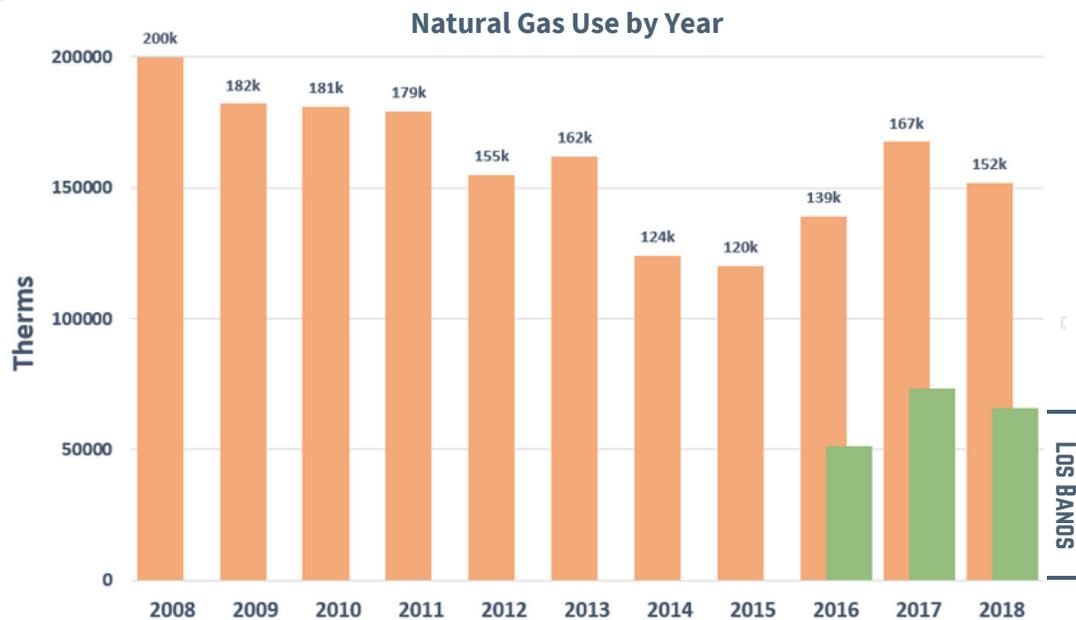


PURCHASED NATURAL GAS

When compared to electricity use, the City doesn't use a tremendous amount of Natural Gas. For example, the City spends approximately \$130,000 on natural gas annually, as compared to over \$3 Million spent on electricity each year. However, natural gas is one of the City's primary energy sources so it warrants mention in this report.

2018 saw a 10% decrease in natural gas usage over 2017. This is likely due to a warmer late winter and spring in early 2018 during which City buildings and infrastructure required less overall heating. The City sees a lot of fluctuation in Natural Gas use simply because it is so weather dependent.

As has always been the case, the Los Banos Del Mar Pool remains by far the most significant user - using natural gas to heat the pool throughout the year. Pool heating accounts for approximately 43% of the City's overall gas usage. The remainder of the natural gas is primarily used for building heating and varies from year to year based on temperature.



ENERGY EFFICIENCY



PURSUING ENERGY EFFICIENCY SINCE 2008

Since 2008 the City has prioritized energy efficiency at its facilities. The energy team is continuously looking for opportunities to lower energy use and cost by replacing outdated and inefficient technologies with new ones.

Since the inception of the Energy Program, the City has saved over four and a half million kilowatt hours of electricity and over \$650,000 per year in annual energy costs, simply by transitioning to more energy efficient technologies and streamlining processes.

Examples of energy efficiency projects include upgrades to HVAC equipment, new lighting fixtures, building automation controls and behavioral changes. The City always tries to maximize efficiency prior to installing any type of renewable energy system at a facility.

\$650,000 ANNUAL SAVINGS

Cumulative Savings To City Operations



Saved Enough
Electricity to Power

**580
HOMES**



Equivalent to Taking

**773
CARS**

Off of the Road

\$990,000

In Incentive Funding Received
from the Utility

4,642,000 KWH

SAVED

From Energy Efficiency
Actions Taken



PROJECT HIGHLIGHTS

SCE STREETLIGHT UPGRADE

The City worked with SCE to take advantage of a special tariff resulting from AB719. This tariff allowed the City to request that all SCE-owned lights be upgraded to high efficiency LED and amortize the cost over 20 years. Over 600 lights were converted through this process and even with the project repayment costs the City will still see an energy savings each year.

Additionally, the City was able to take advantage of the streetlight incentive dollars before the program sunset and received over \$100,000 in incentive funding!

<p>Convert SCE-OWNED STREETLIGHTS to High Efficiency LED Fixtures</p>	<p>312,000 KWH In Annual Energy Savings</p>
<p>\$110,000 In Utility Incentives Received</p>	
<p>Enough Electricity Saved to Power 40 x </p>	

DECORATIVE STREETLIGHT PROJECT

The City is also in the process of upgrading all City-owned decorative streetlights. These streetlights contribute to the architectural beauty of Santa Barbara and are found disbursed throughout the City.

Staff is currently in the process of changing out the lamps to LED which will result in significant energy and cost savings while maintaining the beauty of these corridors.

<p>Convert City-owned DECORATIVE STREETLIGHTS to High Efficiency LED Fixtures</p>	<p>80,000 KWH Saved so Far!</p>
<p>\$10,000 Annual Cost Savings</p>	
<p>Enough Electricity Saved to Power 10 x </p>	

RENEWABLE ENERGY



HEADING TO 100% RENEWABLE

In June of 2017 Council adopted the ambitious goal of 100% Renewable electricity by 2030 for the entire Santa Barbara community. In pursuit of this goal, staff has been working diligently on a Strategic Energy Plan (SEP) that will outline the steps to accomplishing the goal. The SEP is focused around Council priorities of local renewable generation, increased resiliency, reliability and community equity.

The SEP is divided into five program areas that outline various strategies to help get our community to an increased renewable energy portfolio while improving quality of life and disaster recovery efforts in the near future.

Ways the City Produces Renewable Energy:

**SOLAR, BIOGAS AND
HYDROELECTRICITY**



Renewable Content in
Electricity Used by the City



42%

Community Renewable
Content



35%

5

Additional Solar Projects
Currently in Development

1,157,000 kWh^{*}
GENERATED

At City Facilities

* 400,000 kWh of this number cannot be counted in the City's renewable electricity used figure because the City did not retain the Renewable Energy Credits associated with the Hydroelectric facility in exchange for a better rate of return

RENEWABLE ELECTRICITY ASSETS

The City currently has the following renewable electricity assets in its energy use portfolio*:

- El Estero Cogeneration Facility** (650 kW)**
- Corporate Yard Solar** (310 kW)
- Airport QTA Facility Solar** (190 kW)
- Fire Station 1 Solar** (15 kW)
- Fire Station 2 Solar** (10 kW)

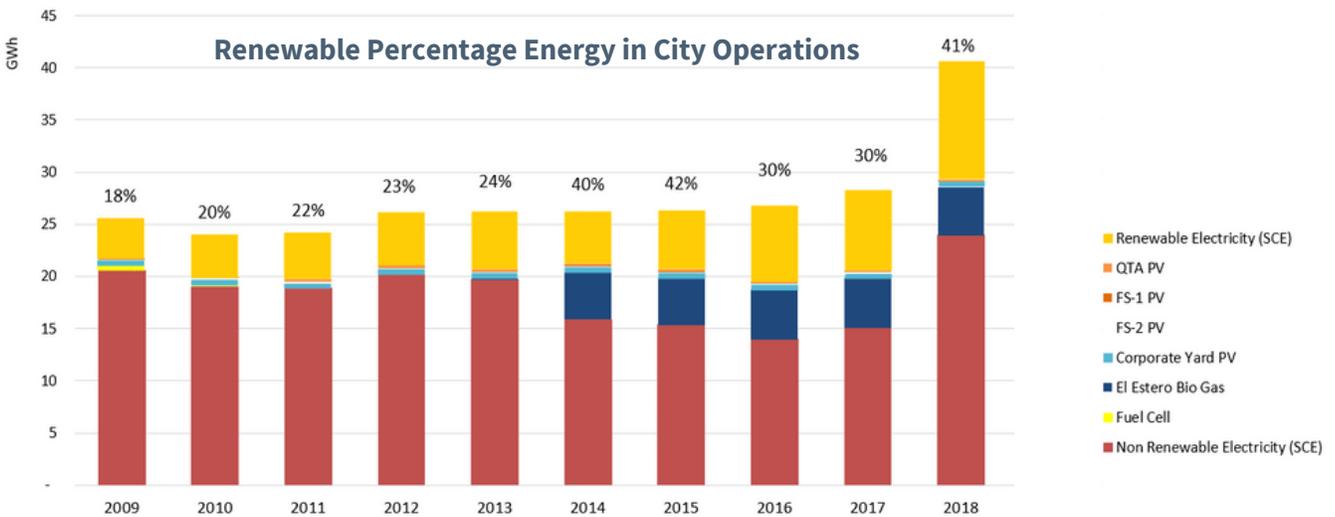
*The City also has the Lauro reservoir hydroelectric facility but did not retain the renewable energy credits and therefore cannot count it in its renewable energy use.

PROJECTS IN THE WORKS

The City is currently in design or development for additional renewable facilities at the following locations:

- Airport Solar** (1.2 MW)
- Granada Garage Solar** (500 kW)
- Eastside Library** (20 kW)
- Fire Station 1 Solar** (18 kW)
- Fire Station 5 Solar** (16 kW)

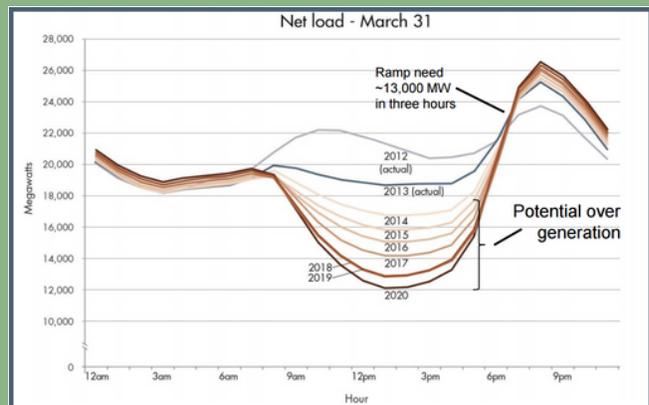
** In 2018 The City reacquired the Renewable Energy Credits associated with the Cogen Facility and is now able to county the electricity generated there in our renewable energy portfolio.



STORAGE IS KING

As the electricity we use is progressively made up of more wind and solar, there is an increased need for flexibility on the grid. Each of these power sources come with their own unique drawbacks - particularly that they are intermittent.

As a result the "duck curve" (right) is formed where there is an overabundance of solar during the daylight hours and a steep ramping of demand in the evening hours as the sun sets and winds die down. The quick ramping has created problems for the utility companies that need to now bring their infrastructure online very quickly to meet the spike in demand.



Utilizing battery storage systems, charged by the surplus of daytime solar, to smooth out the distribution of energy is a key element to ensuring stable electricity availability throughout the day and night.

COMMUNITY ENERGY



IT'S A TEAM EFFORT

Council's renewable energy goal was set for the entire community so accomplishing the will require a concerted effort from all Santa Barbarians and local businesses.

Municipal electricity use only accounts for about 8% of the overall local electricity demand in the City. That means the majority of the focus needs to be on local contributions in energy efficiency and renewable development.

PACE

In late 2017, City Council approved it's first Property Assessed Clean Energy Financing program for operation within the City, as an additional tool to help the adoption of energy efficiency and renewable electricity systems.

PACE is defined in detail in the sidebar, but simply put this program is a tool for home and business owners who want to do energy, water and other efficiency (or renewable energy) improvements to their buildings.

The City currently has 3 approved PACE providers and more information can be found on these programs on the City's website at www.SantaBarbaraCA.gov/PACE.

GTSR

The City has been working closely with SCE in 2018 to develop a set of Green Tariffs that will help drive additional renewable electricity use. These tariffs are looking to help the City and local business and residents have access to locally-sourced clean energy.

This series of five Green Tariffs are currently under review by the California Public Utilities Commission and will hopefully be available in 2020.

PACE

The property assessed clean energy (PACE) model is an innovative mechanism for financing energy efficiency and renewable energy improvements on private property. PACE programs exist for both residential properties and commercial properties.

PACE programs allow a property owner to finance the up-front cost of energy or other eligible improvements (such as water efficiency or wildfire mitigation) on a property and then pay the costs back over time through a voluntary tax assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than an individual.

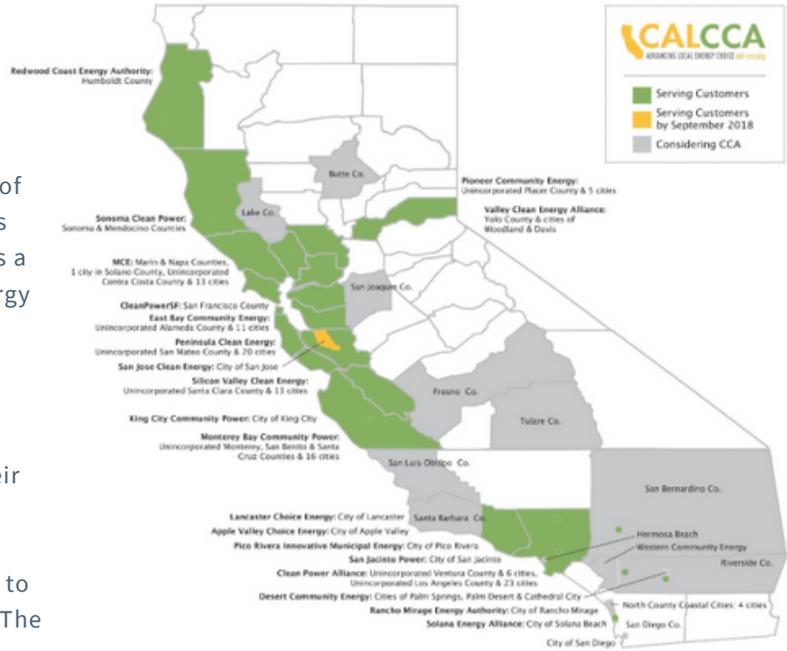
A PACE assessment is a debt of property, meaning the debt is tied to the property as opposed to the property owner(s). In turn, the repayment obligation may transfer with property ownership if the buyer agrees to assume the PACE obligation and the new first mortgage holder allows the PACE obligation to remain on the property. This can address a key disincentive to investing in energy improvements because many property owners are hesitant to make property improvements if they think they may not stay in the property long enough for the resulting savings to cover the upfront costs.

COMMUNITY CHOICE ENERGY

The City is currently evaluating the feasibility of Community Choice Energy (CCE, also known as Community Choice Aggregation or CCA). CCE is a programs that emphasizes local choice in energy procurement and allows local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while still receiving transmission and distribution service from their existing utility.

CCE has many benefits, especially as it relates to accomplishing the renewable electricity goal. The primary benefit is that CCEs are opt out meaning that the local government can transition all constituents into high renewable content portfolios with the option to opt down to cheaper, less green power or even back to the utility.

The City is currently looking into whether such a CCE could offer competitive rates as compared to SCE and expects to have results in mid-2019.

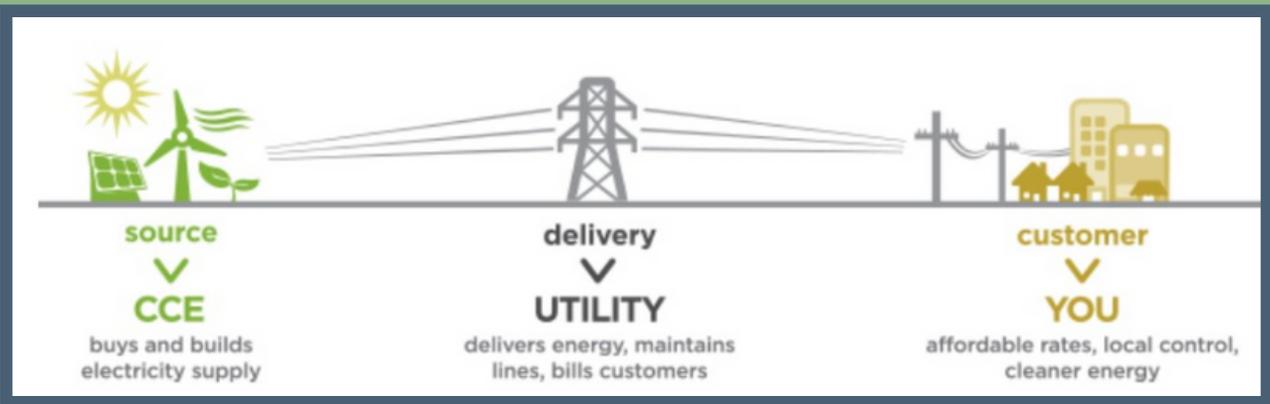


Additional benefits include:

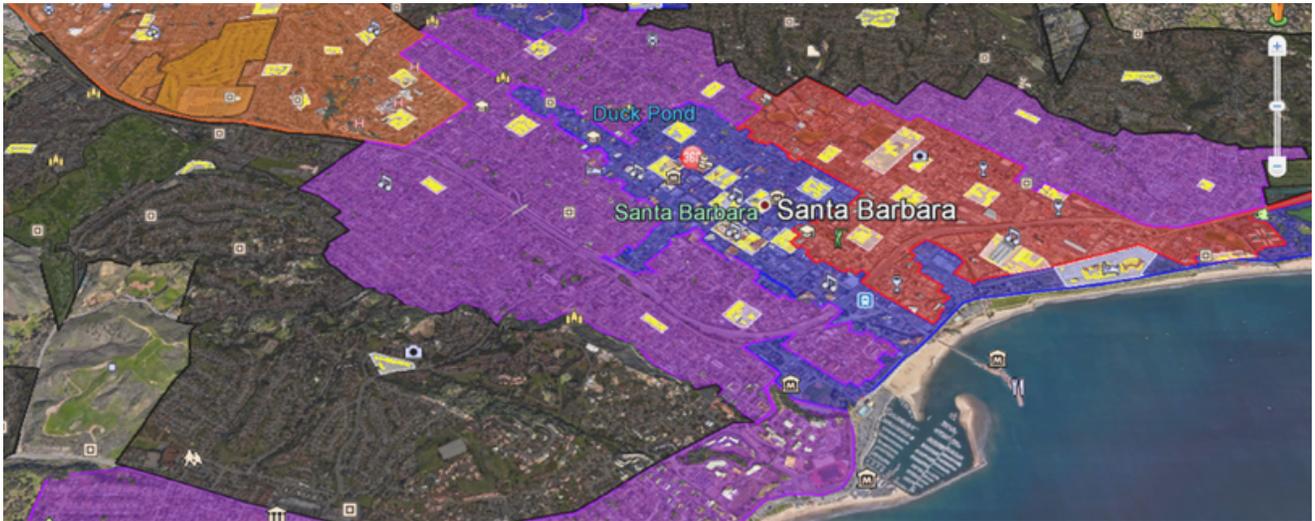
- Local control
- Ability to set locally relevant tariffs, including renewable feed-in tariffs
- Potential revenue for increased electrical reliability and resiliency
- Locally designed and implemented programs and policies
- Local jobs and economic development

LOCAL CHOICE

CCE allows a local government (or group of governments) to pool their electrical demand and buy power from sources of their choosing. This means that a CCE could choose to dramatically increase the amount of renewable energy procured and to use local revenues to develop local energy projects as well as programs that are aligned with the needs and wants of the community.



ACKNOWLEDGEMENTS



IT'S IN THE CULTURE

There is no one person who accomplishes all of the energy work done at the City. Simply put, it's in the City's organizational culture. All City employees embrace the City's goals and do their part to ensure that the City's energy usage is efficient and resourceful.

There are a few City individuals who have gone above and beyond this year to help the energy team and to ensure that the City makes the most of its assets in terms of operating efficiently and identifying opportunities for renewable development or further energy savings. These 2018 energy heroes are called out in the sidebar to the right.

Additionally, we are fortunate to have Councilmembers who care tremendously about the impact of energy use on and in our City and who have made big decisions to prioritize energy action. A big thank you to Council for all of their support!

THE HEAVY HITTERS

Mike Wiltshire
Matt Fore
Jeff McKee
Karl Treiberg
Dion Tait
Victor Garza
Rich Hanna
Timmy Bolton
Rosemary Dyste
Joshua Haggmark
Andrew Rhodes
Derrick Bailey
Todd Heldoorn
David Lewis
Rob Dayton
Tina Diaz
Mark Wilkening

