City of Santa Barbara Strategic Energy Plan – Collated Appendices

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Appendix I – Load Forecast & Strategy Impact Modeling Methodology

Strategic Energy Plan Scenarios

In order to plot Santa Barbara's path to 100% renewable electricity and inform the necessary strategies for inclusion in the Strategic Energy Plan, the SEP modeling created three primary scenarios. These scenarios vary primarily by the community-wide electricity forecasts. The "Low Load" and "High Load" scenarios also utilize the low and high end, respectively, of the estimated local solar capacity as a modeling parameter. The forecasted electricity load is expected to decrease in the Low and Medium scenarios and stay relatively flat and increase slightly under the High scenario. This differs from trends expected throughout much of California, where widespread electric vehicle adoption and building electrification is expected to increase electricity demand. Possible reasons for the variation in Santa Barbara's electricity load are explored below.

Forecast Component	Discussion
Historical Electricity Usage	Electricity usage, particularly in the commercial sector in Santa Barbara, has been dropping quickly in the last 7 years. This trend would likely take a few years to reverse. Since the projections included in the SEP are through 2030, a reversal in this trend may not be fully captured in the timespan of the SEP
Electric Vehicle Adoption	Current data and future projections of vehicle electrification in Santa Barbara, while enough to meet state goals, do not have as large of an impact as expected. Both the Baseline and High Load scenario use electric vehicle estimates greater than SoCal Edison projections (based on California Energy Commission data), which already outpace growth needed to meet statewide goals. However, based on current electric vehicle mileage and miles driven in Santa Barbara, estimates for electricity consumption per vehicle are lower than those used by SoCal Edison, meaning that a higher number of vehicles adopted does not necessarily translate to a higher electricity load projection. The risk that these even the high end of these projections is too low, and that the City could drive further adoption, is discussed in Appendix II.
Building Electrification Impacts	The temperate climate in Santa Barbara means that gas usage is already lower than other parts of California. This overall demand for less energy mitigates the impacts of fuel switching from gas to electricity.

The three scenarios are shown below and the methodology to establish each scenario is described in the following section.

Figure 1: Medium Load Scenario - Community-wide Electricity Load and Strategy Impact Forecast

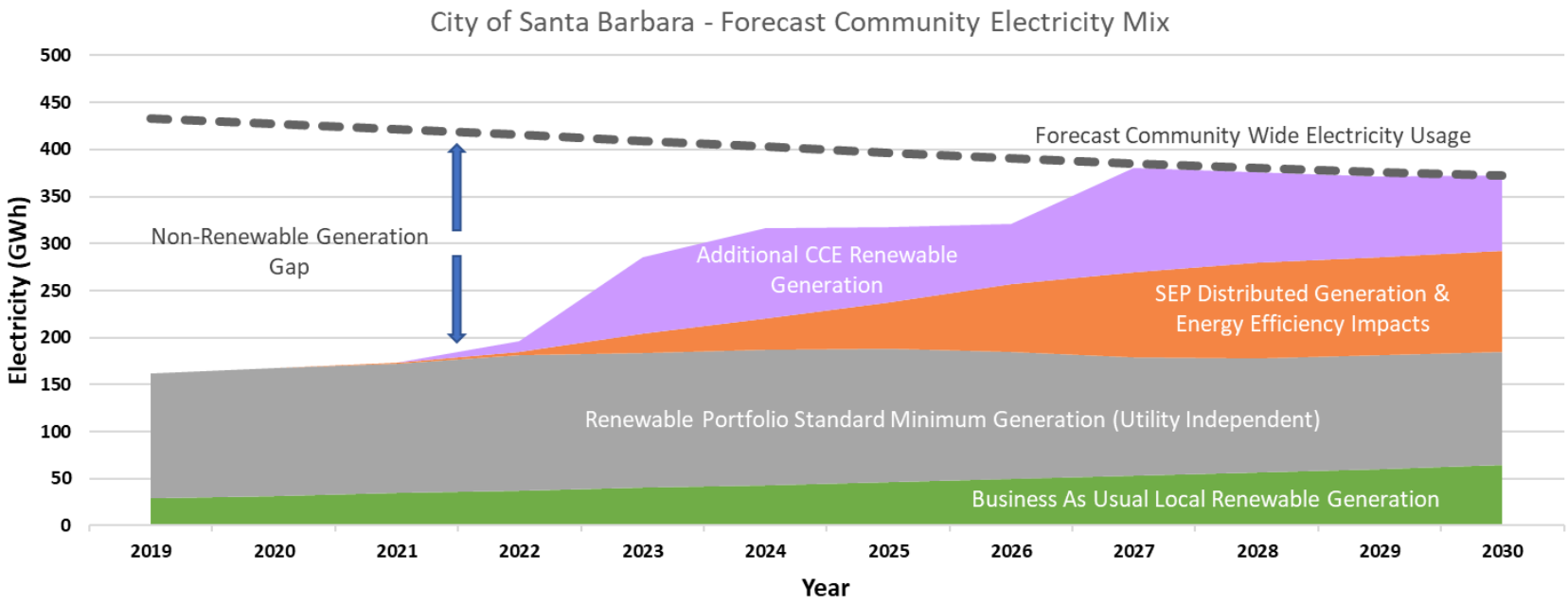


Figure 2: Low Load "Best Case" Scenario - Community-wide Electricity Load and Strategy Impact Forecast

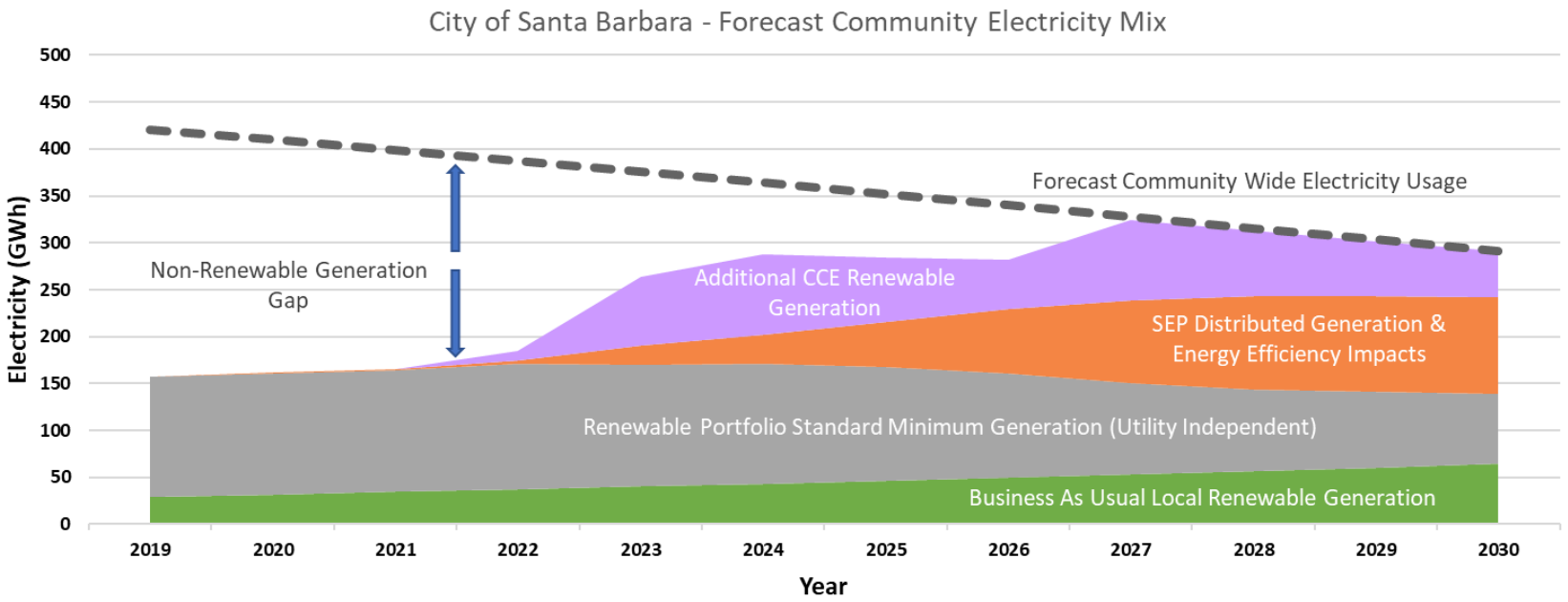
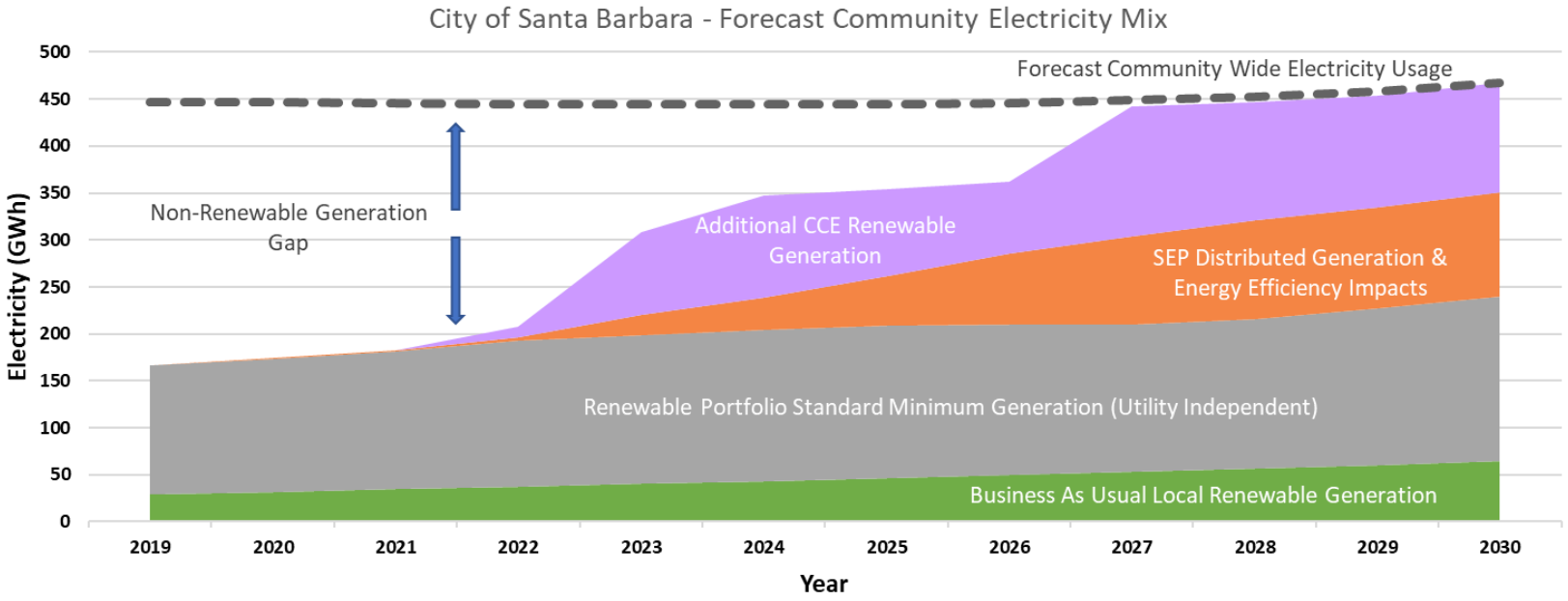


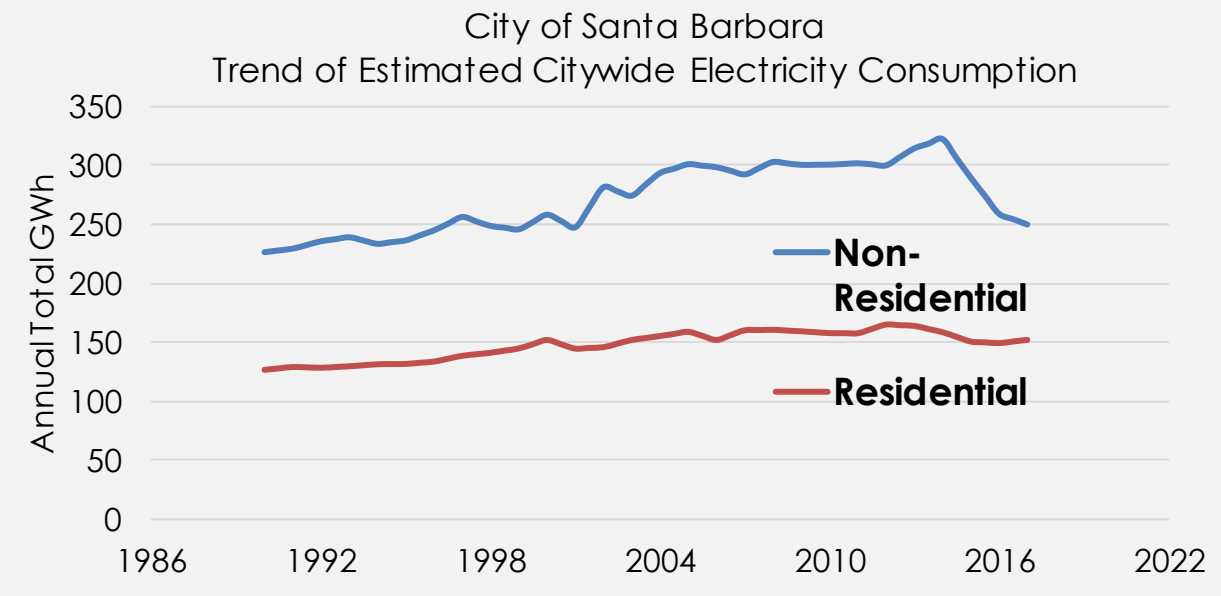
Figure 3: High Load "Worst Case" Scenario - Community-wide Electricity Load and Strategy Impact Forecast



Electricity Demand and Generation Forecast Methodology

Demand was forecasted in three separate portions: residential building load, commercial building load, and electric vehicle (EV) load. A combination of Santa Barbara City electricity consumption data from Southern California Edison (SCE) and Santa Barbara County electricity consumption data from California Energy Commission was used as the main source for historic electricity consumption in Santa Barbara.

Figure 4: Trend of Historical Community-wide Electricity Consumption

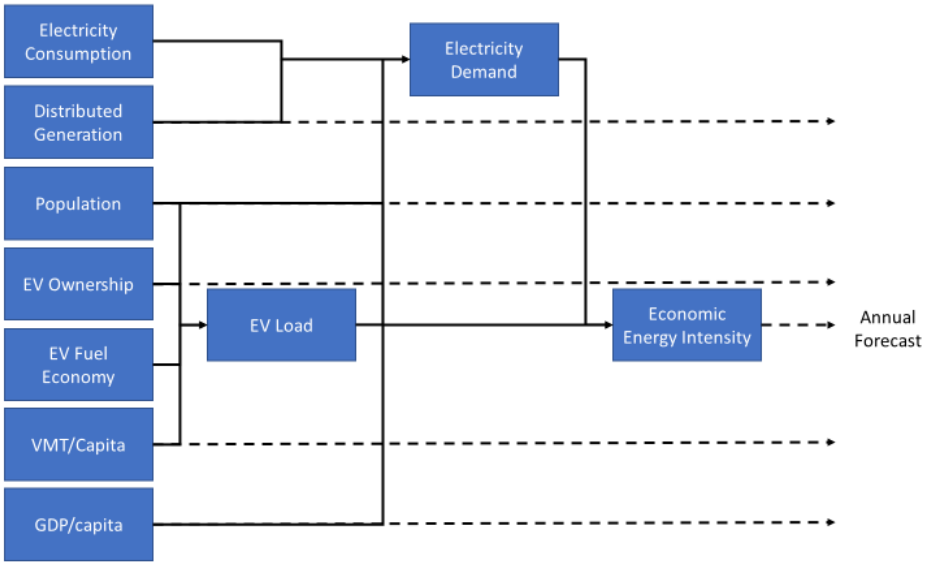


However, this electricity consumption from this data included both the effects of both EVs increasing consumption and on-site solar generation decreasing consumption. Therefore, EV load was subtracted and on-site generation was added back to calculate historical electricity demand without these effects.

EV load was calculated based on historical EV ownership data, vehicle miles traveled (VMT) per capita data, population, and EV fuel economy data. When multiplied together, these four components equal EV electricity load. EV ownership data was taken from the Department of Motor Vehicles (DMV) and State and Local Energy Data (SLED), VMT for Santa Barbara was based on national-level data from Federal Reserve Economic Data (FRED) and local data from SLED, population was based on US Census data, and EV fuel economy data was taken from the Environmental Protection Agency (EPA). Distributed generation data in Santa Barbara was taken from California Distributed Generation Statistics.

Rather than residential and commercial demand being forecasted directly, it was broken into three more parts: economic energy intensity (energy demand per dollar of economic value), GDP/capita (economic value per person), and population. When multiplied together, these three components equal electricity demand. Historical GDP/capita data was taken from the Bureau of Economic Analysis.

The figure below summarizes how the main components were calculated historically.

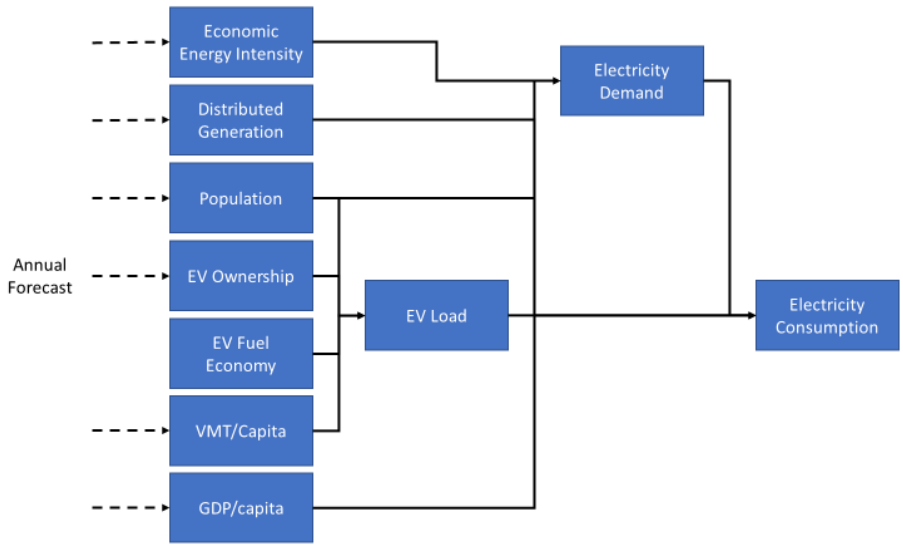


In total, the following components were directly forecasted forward to 2030 based on historical data.

- Population
- Residential economic energy intensity
- Commercial economic energy intensity
- GDP/capita
- EV ownership
- VMT/capita
- Residential distributed generation
- Commercial distributed generation

Each of these was forecasted to continue growing linearly at its historical rate except GDP/capita, which was forecasted to continue growing exponentially at its historical rate. Linear growth rates were found to be a more accurate fit for past growth than exponential rates for all except GDP/capita. Although it is possible for some of these, particularly EV ownership, to transition from growing linearly to growing exponentially, the extent to which they will do so, as well as when they will do so, is difficult to estimate. Alternate scenarios were used to account for this possibility, which will be explained in further detail below. Furthermore, even based on linear growth rates, EV ownership was projected to be greater than California Energy Commission ownership predictions. Alternate scenarios were used to account for different growth rates, which will be explained in further detail below.

The figure below summarizes which components were calculated annually in the forecast.



After each component was forecasted, EV load was calculated annually based on the forecast population, EV ownership, and VMT/capita. EV fuel economy was estimated to stay roughly constant- while light-duty vehicles will improve in efficiency, a greater number of heavy-duty vehicles with lower fuel economy will also be electrified.

Electricity demand was calculated based on the forecast economic energy intensity, population, and GDP/capita. The electricity demand and EV load were combined with the forecast distributed generation to determine annual electricity consumption.

Alternate Forecast Scenarios

In order to account for a wide range of outcomes based on the many factors impacting community-wide electricity load, two alternate forecast scenarios were created; a "high load" scenario and a "low load" scenario. The "high load" scenario involved higher load than expected, while the "low load" scenario involved lower load than expected.

To create these alternative scenarios, all forecast rates were either increased or decreased by 20% compared to their historical average, depending on the scenario. The changes are summarized below:

Forecast Component	Low Load Scenario	High Load Scenario
Population Growth	Lower	Higher
GDP/Capita Growth	Lower	Higher
Economic Energy Intensity Growth	Lower	Higher
EV Ownership	Lower	Higher

Potential rapid or slow growth in electricity load is accounted for in the alternate scenarios by either increasing or decreasing rate forecasts by 20% compared to their historical averages.

Another important difference between the two scenarios is the use of either the high end or the low end of the solar potential calculation. The "low load" scenario was combined with the high end of the local solar potential calculation, in effect making this a "best-case" scenario, with regards to achieving the City's goals.

The "high load" scenario was combined with the low end of local solar potential, effect making this a "worst-case" scenario, with regards to achieving the City's goals.

Strategy Impact Calculation

Solar Strategy Impact

The majority of the strategies recommended in the SEP are geared towards promoting local solar development in Santa Barbara. The impact of each of these strategies was calculated similarly:

1. Use solar and solar + storage pricing data from the National Renewable Energy Laboratory (NREL) to determine baseline national costs for solar and solar + storage[1]. Add multipliers for increased regulatory permitting costs due to the Architectural Board of Review (ABR) and Historic Landmarks Commission (HLC), where applicable. Final costs are shown in the table below.
2. Calculate a "tipping point" for solar/solar + storage prices, where payback period for installations is under 5 years. At this tipping point, it was assumed that the financial case for installing solar would be strong enough for 90% of total city-wide solar potential to be realized. Final tipping points are shown in the table below.
3. Calculate the "price gap" as the difference between the baseline cost and tipping point cost.
4. Determine the cost reduction or the revenue increase for a solar or solar + storage installation.
5. Calculate the "boost rate" as the ratio of this cost reduction to the price gap.
6. Use this boost rate to calculate the total amount of solar capacity installed due to the strategy. Spread this installed capacity over the strategy impact period, generally assumed to be 3-5 years.

	Residential Solar	Commercial Solar	Residential Solar + Storage	Commercial Solar + Storage
Current Cost – ABR ($/W)	$2.78	$2.12	$5.10	$3.91
Current Cost – HLC ($/W)	$2.92	$2.22	$5.61	$4.10
Tipping Point ($/W)	$1.12	$0.70	$2.38	$2.10

Individual Strategy Impact

Strategy 1.1: Formalize Energy and Climate Program

This strategy is not directly meant to increase local solar capacity but is necessary to implement the rest of the strategies to do so. As such, 30% of the impact of every other non-CCA strategy was ascribed to this strategy.

Strategy 1.2: Continue Exploring Community Choice Aggregation (CCA)

CCA impact was calculated based on the additional amount of renewable generation that it would provide on top of the RPS-minimum renewable generation, to the customer accounts enrolled with it. As an example, while a CCA could be 100% renewable, if the RPS required 60% renewable electricity, the CCA would only be granted credit for providing 40% of the utility renewable generation being supplied to Santa Barbara.

[1] NREL data was used as it splits costs into many categories: module, inverter, structural BOS, electrical BOS, supply chain, sales tax, install labor, permitting, inspection, interconnection (PII), sales & marketing, overhead, net profit, and contingency.

It was expected that municipal accounts would enroll in 2022, followed by commercial accounts in 2023 and residential accounts in 2024. Renewable content was set at 75% at the beginning, and then 100% starting 2027. The increase in renewable content is based on the projected financial feasibility of offering high renewable content electricity at a price power than SoCal Edison's rates that was established in past CCE feasibility studies for the City.[2]

Strategy 1.3: Participate in a Regional Climate & Energy Collaborative

Due to the difficulty of estimating direct impacts due to collaboration, as a proxy, it was estimated that this strategy would result in a large regional project being built. This was chosen as a proxy because it was assumed that one of the main goals of a regional energy collaborative would be to develop a utility-scale project in southern Santa Barbara County. Assuming that the solar generation would be split roughly on a population basis, 50% of a potential 5 MW project was credited to Santa Barbara, resulting in approximately 3500 MWh of additional solar generation.

Strategy 2.1: 100% Renewables Education, Outreach & Behavior-change Programs

The impact of this strategy was measured in its ability to reduce marketing and outreach costs for solar developers. These costs were not significant for commercial installations but comprised approximately 10-15% of costs of residential installations. It was estimated that by increasing awareness of the benefits of solar and increasing community engagement in meeting the 100% goal locally, this strategy could reduce these marketing costs for developers by 30%, or 3-5% of total residential installation costs. This translated to a boost rate of 5-8% for residential solar and solar + storage installations.

Strategy 3.1: Offer Financial Incentives for Solar + Storage

The impact of this strategy was based on the defined length and amount of the incentive. For a performance-based incentive (PBI) lasting 5 years, a 1 c/kWh incentive for a solar installation would be equal to roughly a $0.07/W reduction, while a 2 c/kWh incentive for a solar + storage installation would be equal to roughly a $0.14/W reduction. Since this strategy targets the general cost of solar installations rather than a specific portion of the cost like marketing and outreach, its impact is the most malleable- the length and amount of the incentive can be changed to increase the impact of this strategy.

Strategy 3.2: Pilot On-Bill Financing for DER

Two reports were used as a source for the impact of energy financing. The first was the federal report on solar Commercial Property Assessed Clean Energy (C-PACE) impact in California and other states. The second was an energy efficiency financing program comparison by the Lawrence Berkeley National Laboratory (LBNL) between on-bill financing (OBF), PACE, and other options such as energy service performance contracts. This allowed a translation of the relative efficacy of PACE and OBF in energy efficiency for solar installations.

Strategy 4.1: Develop Distributed Energy Resources (DERs) & Microgrids at Municipal Facilities

Impact for this strategy was determined by creating high-level solar designs at each proposed site. These designs are described in greater detail in Municipal Resource Potential and Appendix III.

Strategy 4.2: Pursue Community Solar

Impact for this strategy was determined by creating high-level solar designs at each City-owned site that could potentially be used for a community solar project. These designs are described in greater detail in Detailed Strategy Descriptions and Appendix III. It was assumed that this strategy would be developed

[2] See Pacific Energy Advisors Study discussed in Detailed Strategy Descriptions.

through SoCal Edison's proposed pathway, where 80% of the production would have to be subscribed to by City accounts.

Strategy 4.3: Create Smart Energy Zone

This strategy is aimed to act as a pilot testing ground for many of the other strategies. It was estimated that the Smart Energy Zone (SEZ) would double the impact of all strategies, but only within the confines of the one square mile of the SEZ. For example, if the impact of a city-wide strategy was determined to be 15 GWh annually over the roughly 15 square mile size of Santa Barbara, approximately 1 GWh would be located in the SEZ. As such, the SEZ would add an additional 1 GWh of impact.

Strategy 5.1(a): AB2188 Performance Review and Strategy 5.1(b): Expansion of Expedited Solar Permitting

Together, these strategies were aimed at increasing the size of solar systems eligible for expedited permitting. NREL data indicated lower permitting costs for residential projects compared to commercial projects. As such, permitting costs for commercial projects up to the 40-kW threshold were reduced to the residential level. This resulted in a cost reduction of approximately 1%, and a boost rate of approximately 2%.

Strategy 5.1(c): Pilot Automated & Standard-Design Permitting for Clean Energy Measures

This strategy was also aimed at reducing permitting costs. Based on discussions with local solar installers, it was estimated that it would reduce permitting costs for both residential and commercial projects by 50%, leading to a total cost reduction of 2-5%, and a boost rate of 4-10%.

Strategy 5.1(d): Clarify Citizen Review Board Processes

This strategy is aimed at reducing the increased regulatory costs of the ABR and HLC. Based on discussions with local solar installers and City staff, it was estimated that it would reduce these regulatory costs for both residential and commercial projects by 50%, leading to a total cost reduction of 2-5%, and a boost rate of 4-10%.

Strategy 5.2: Explore Title 24 Building Code Improvements

This strategy was modelled as a reach code for commercial buildings to achieve zero-net-energy (ZNE). It was estimated based on ZNE case studies by the New Buildings Institute[3] that a ZNE building would have only 30% the electricity usage of a current building, and that the remainder of the electricity would be provided by solar. It was estimated that this code would be mandatory, so every new construction and major retrofit would have to undertake this ZNE reach code. Since building codes are updated every 3 years, this code was assumed to be in place for one code cycle.

Strategy 5.3: Implement an Energy Disclosure and Performance Policy

SLED data was used to determine the number of buildings in Santa Barbara at various size thresholds, as well as how much of commercial square footage was covered at each size threshold. It was assumed that electricity usage per square foot would be distributed normally around the mean. Benchmarks were implemented that started at 50% over the mean in 2024 and then ratcheted down to 20% over the mean in 2030. It was then assumed that 90% of those above this energy benchmark would comply and undertake retrofits to reduce energy usage to that benchmark.

[3] https://newbuildings.org/hubs/zero-net-energy/#case-studies

Primary Data Sources for SEP Modelling

Source	Data Type	Link
Private Data provided by SoCal Edison	City-wide electricity consumption	N/A
California Energy Commission (CEC)	County-wide electricity consumption	https://ecdms.energy.ca.gov/elecbycounty.aspx
US Census	Population	
Department of Motor Vehicles	Electric vehicle adoption	https://www.dmv.ca.gov/portal/dmv/detail/pubs/media_center/statistics
State and Local Environmental Data	Electric vehicle adoption	https://www.eere.energy.gov/sled/#/results/elecandgas?city=Santa%20Barbara&abv=CA&section=electricity&currentState=California&lat=34.4208305&lng=-119.69819010000003
Federal Reserve Economic Data	Vehicle Miles Travelled	https://fred.stlouisfed.org/graph/?g=lls
Environmental Protection Agency	EV efficiency	https://www.epa.gov/compliance-and-fuel-economy-data/data-cars-used-testing-fuel-economy
CEC	Distributed Generation installed	https://www.californiadgstats.ca.gov/downloads/
National Renewable Energy Laboratory	PV system costs	https://www.nrel.gov/docs/fy17osti/68925.pdf
PaceNation.US	Efficacy of low-interest loan financing	https://pacenation.us/wp-content/uploads/2018/08/2017-C-PACE-Annual-Impact-Report-Optimized.pdf
Lawrence Berkeley National Labs	Efficacy of low-interest loan financing	https://emp.lbl.gov/sites/all/files/lbnl-1005754.pdf
New Buildings Institute	Impacts of ZNE construction on efficiency	https://newbuildings.org/hubs/zero-net-energy/#case-studies

Appendix II – Implementation Risks

As the Santa Barbara implements the strategies included in the SEP, there are several risks, and accompanying challenges, that the City should be aware of. These risks exist primarily at the state and regional level, outside of the City's control and may have a significant impact on the City's ability to achieve its renewable electricity goal.

Regulatory Risks

Overview

While California's climate and energy policy has consistently supported renewable energy, and likely will not change, regulatory questions and decisions always have the potential to impact the City's ability to reach its goal. The Power Charge Indifference Adjustment (PCIA) decision (see Detailed Strategy Descriptions: Strategy 1.2) is an example of unexpected regulatory decision that strongly impacted the City's ability to reach its goal. This table includes a discussion of current regulatory issues that create risks to the City's SEP implementation, primarily by introducing uncertainty around the environment within which a CCE program will be operating and uncertainty around electricity costs levied by SoCal Edison.

Risk	Risk Summary
State-wide Procurement Uncertainty	The combination of California's renewable and carbon-free energy goals and the proliferation of Community Choice Aggregators (CCAs) has created some uncertainty in the long-term procurement of electricity. While every CCA in operation at the time of the 2018 RPS report was ahead of schedule[4] and committed to procure renewable electricity at, or above, the state-mandated amounts moving forward,[5] the number of CCAs has disrupted the role of the three major investor owned utilities. The CPUC found that the current procurement plans of all load-serving entities (LSE) are not sufficient to meet the State's renewables goals.[6] In response, resulting from the most recent Integrated Resource Planning (IRP) process, the CPUC adopted a decision that included two important pieces; a Preferred Resource Portfolio to guide LSEs as they procure electricity to meet California's 2030 RPS goals and created a framework for a more robust IRP process moving forward.[7] The majority of future electricity procurement through 2030 is projected to be undertaken by CCAs and their proliferation necessitated a new framework that could accommodate all LSEs, beyond the three major utilities.[8] There are also proposals in the State legislature (AB 56) to create a state agency to act as a back-stop for electricity procurement to centralize the process. Stakeholders cannot agree on how broad a mandate this new agency should have and whether it

[4] California Public Utilities Commission. *Renewables Portfolio Standard Annual Report 2018,* p. 8. (November 2018). https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Renewables%20Portfolio%20Standard%20Annual%20Report%202018.pdf

[5] Chaset, Nick. "Busting the Myth that CCAs Don't Sign Long-term Renewable Energy Contracts". Greentech Media. (February 25th, 2019). https://www.greentechmedia.com/articles/read/busting-the-myth-that-cca-dont-sign-long-term-renewable-energy-contracts#gs.ciwckk

[6] California Public Utilities Commission. Rulemaking 16-02-007. *Proposed Decision of ALJ Fitch: Decision Adopting Preferred System Portfolio and Plan for 2017-2018 Integrated Resource Plan Cycle.* (March 2019). http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M272/K614/272614400.PDF

[7] California Public Utilities Commission. Rulemaking 16-02-007. *Final Decision: Decision Adopting Preferred System Portfolio and Plan for 2017-2018 Integrated Resource Plan Cycle.* (April 2019). http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M284/K786/284786020.PDF

[8] Ibid

	should only be responsible for procuring resources to meet Resource Adequacy needs or for a much broader swath of procurement responsibilities.[9] The results of these debates will shape the role and requirements of any future CCA in Santa Barbara and impact the electricity mix entering the City.
Microgrid Tariff & Interconnection Uncertainty	As discussed in Detailed Strategy Descriptions: Strategy 4.1, there are several regulatory barriers that inhibit the widespread commercialization of microgrids in the California. Current proceedings are underway, however, as a result of SB 1339, to address these barriers by December 2020. The results of this proceeding and the details of the resulting tariff and interconnection rules will directly impact the City's ability to implement Strategy 4.1 and develop innovative projects that provide resilience benefits to the community.
Wildfire Liability	The wildfires that impacted California in 2017 and 2018 have created massive liabilities for the State's IOUs. The damages from fires in Northern California caused Pacific Gas & Electric to file for bankruptcy, and, while SoCal Edison has avoided bankruptcy, an investigation did find it responsible for starting the Thomas Fire (and resulting Montecito mudslides) that caused severe damages to Santa Barbara and the surrounding communities.[10] Wildfires are already highlighting the importance of renewable energy, resilience and reliability in Santa Barbara, and they are expected to increase in frequency due to climate change. The impacts they will have on the electrical system and electricity rates will impact Santa Barbara's SEP implementation. Increased wildfires almost certainly mean higher utility rates, as California passed a law in 2018 to shield its utilities from excess wildfire liability by passing costs on to customers.[11] Higher rates would increase the economic burden on the Santa Barbara community but could also increase the feasibility of solar systems and CCE.

Wholesale Market Risks Overview

As California rapidly pursues future of carbon-free electricity, increased renewables on the electric grid are affecting the wholesale electricity markets and changing the way the electrical grid is managed. The variability of renewable generation creates challenges in wholesale electricity markets and grid operations that may affect Santa Barbara's pursuit of its 100% renewable goal.

Risk	Risk Summary

[9] Saint John, Jeff. "California Bill Proposes a Backstop Authority to Secure State's Power". Greentech Media. (April 25, 2019). https://www.greentechmedia.com/articles/read/california-bill-proposes-a-backstop-authority-to-secure-the-states-power-gr#gs.bqwvua

[10] Serna, Joseph. "Southern California Edison power lines sparked deadly Thomas Fire, investigators find". Los Angeles Times. (March 13, 2019). https://www.latimes.com/local/lanow/la-me-ln-thomas-fire-edison-cause-20190313-story.html

[11] Ailworth, Erin and Sara Randazzo. "California Passes Bill to Rescue Utility Facing Fire Costs". Wall Street Journal. (September 1, 2018). https://www.wsj.com/articles/california-passes-bill-to-rescue-utility-facing-fire-costs-1535783276

Excess Solar	As solar development rapidly expands in California, the electrical grid is experiencing large amounts of solar output at midday, followed by a dramatic spike in net demand in the early evening as solar production decreases and usage increases.[12] This is impacting behind-the-meter solar, as utilities shift their rate structures in a way that reduces the value of those systems. All three IOUs in California are shifting the most expensive electricity periods from the middle of the day to the evening. This erodes the value of the electricity produced by solar systems under net-metering. Recent changes to net-metering rules that support storage development will help hedge against the reduced value of solar, but the increase in overall system cost may still hinder behind-the-meter solar development. It also impacts the wholesale market and can create negative prices for utility-scale solar at certain times of day and year. If these negative prices become more common as more solar is introduced to the electrical grid, it may affect the City's ability to procure off-site solar at an affordable rate via a CCE program.

Technology Cost & Installation Risks

Overview

Achieving Santa Barbara's renewable electricity goal and harnessing the local benefits highlighted by City Council and throughout the SEP requires significantly increased adoption of DERs. The cost of those DER technologies and the ease of installation are key drivers, or barriers, to the necessary levels of adoption. While the City can impact the costs of DERs in many ways discussed in the SEP (streamlined permitting, incentives, financing options), a certain portion of those costs are dependent on global supply chains and other variables outside of the City's control. Similarly, the rules governing interconnection to the distribution grid are determined by SoCal Edison with little input from the City.

Risk	Risk Summary
DER Cost Reduction Trends	While grid-scale renewable energy technologies have decreased markedly and consistently in price over the past ten years,[13] the cost of battery storage has only recently become competitive with coal and natural gas.[14] The story is similar in behind-the-meter applications, as battery storage costs have dropped significantly but lagged behind solar.[15,16] As battery storage becomes increasingly important in the economic feasibility of distributed resources and in management of the wholesale electricity grid, continued cost reductions will be necessary mitigate any wholesale procurement costs that affect retail electricity prices and to increase the viability of behind-the-meter installations for homes and businesses. While trends indicate that these cost reductions may be realized, future cost reductions are not guaranteed.

[12] California Independent System Operator (CAISO). *What the Duck Curve Tells us about Managing a Green grid.* (2016). https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf

[13] Lazard. *Lazard's Levelized Cost of Energy Analysis: Version 12.0*. (November 2018). https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf

[14] Bloomberg New Energy Finance. "Battery Powers Latest Plunge in Cost Threatens Coal, Gas". (March 26, 2019). https://about.bnef.com/blog/battery-powers-latest-plunge-costs-threatens-coal-gas/#_ftn1

[15] Fu, R et al., p viii. https://www.nrel.gov/docs/fy19osti/72399.pdf,

[16] Frankel, David, Sean Kane and Christer Tryggestad. "The New Rules of Competition in Energy Storage". McKinsey and Company. (June 2018). https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/the-new-rules-of-competition-in-energy-storage

	Continued DER cost reduction trends will also directly impact SEP implementation costs for the City as it finalizes the DER incentive designs discussed in Strategy 3.1 and determines an appropriate incentive amount.
Capacity of the Local Distribution Grid	A review of the interconnection capacity of the local distribution grid in Santa Barbara revealed that about 47 MW of distributed generation could be interconnected with no additional review from the utility. This is not the upper limit of interconnection capacity, rather it is the upper limit of streamlined interconnection capacity. For projects beyond the initial 47 MW, the location with respect to the distribution grid will take on additional importance with regards to the cost and time required for installation. While the capacity of the distribution grid in Santa Barbra does not preclude the installation of the 110 MW of distributed resources expected under the most likely SEP scenarios, it may create challenges that impact certain projects.

Prioritization Risks

Overview

Beyond its 100% renewable electricity goal, the City of Santa Barbara has important climate priorities. From a simplistic point of view, two primary strategies for mitigating climate change, vehicle electrification and building electrification, will make it more difficult for the City to achieve 100% renewable electricity because they increase community-wide electricity usage in the City. This does not mean that the City should not pursue these goals, however, the City should be aware that climate and energy priorities, while related, can also be in competition. Awareness of this relationship enables the City to make strategic policy and project decisions that capitalize on the climate and energy overlaps instead of placing them in opposition.

Risk	Risk Summary
Vehicle Electrification	While the SEP considers three scenarios for community-wide electricity load, as discussed in Appendix I, EV adoption at rates beyond those considered is always a possibility. As technology develops throughout the course of SEP implementation, the City should explore opportunities to use increased adoption of electric vehicles to support renewable energy development through the colocation of charging infrastructure with DERs and to support grid operations through the use of vehicle-to-building or vehicle-to-grid technologies.
Building Electrification	Building electrification has also been incorporated into the SEP scenarios but could have a larger impact on community-wide electricity load than expected. However, building electrification is often developed through a net-zero energy lens, meaning it is collocated with DERs and energy efficiency measures that mitigate the increased electrical load from the conversion of gas appliances to electrical appliances.

Appendix III – Complete Solar Site List

During the Strategic Energy Plan process, 27 municipal sites 21 private sites were screened for solar viability. Tables 1 and 2 include every site the was screened along with the system size, output and system type. Since energy usage data was available, the Municipal sites include a suggested interconnection type and the system sizes consider load constraints. Private sites were screened based on available space for solar and do not consider load constraints or interconnection type. In order to guide near-term development, City Staff were provided with full site descriptions and financial performance estimates for the municipal sites.

Table 1: Municipal Sites Surveyed

Site Info		PV Info		
Site Name	Address	PV Size (kW)	PV Output (kWh)	System Type (Interconnection Type)
Parking Lot 6	1221 Anacapa St, Santa Barbara, CA 93101	240.5	386,400	Carport (Net-metering)
Police Department Annex	222 E Anapamu St, Santa Barbara, CA 93101	41	67,804	Roof-top (Net-metering)
Westside Community Center	423 W Victoria St, Santa Barbara, CA 93101	55.9	88,386	Roof-top (Net-metering)
Cater Water Treatment Plant	1150 San Roque Rd, Santa Barbara, CA 93105	281.8	454,500	Roof-top & Ground-mount (Net-metering)
City Hall	735 Anacapa St, Santa Barbara, CA 93101	102.9	166,500	Carport (Net-metering)
Memorial Fire Headquarters	121 W Carrillo St, Santa Barbara, CA 93101	51.1	80,600	Roof-top (Net-metering)
Fire Station 8	40 Hartley Pl, Santa Barbara, CA 93117	22.4	33,630	Roof-top (Net-metering)
Parking Lot 10	621 Anacapa St, Santa Barbara, CA 93101	100.5	160,678	Carport (Net-metering)
Parking Lot 13	209 State St, Santa Barbara, CA 93101	26.3	43,250	Carport (Net-metering)
Parking Lot 2	914 Chapala St, Santa Barbara, CA 93101	115.6	186,831	Carport (Net-metering)
Parking Lot 7	1115 Anacapa St, Santa Barbara, CA 93101	110.9	181,466	Carport (Net-metering)
Police Station	215 E Figueroa St, Santa Barbara, CA 93101	44.5	70,750	Roof-top (Net-metering)
Public Library	40 E Anapamu St, Santa Barbara, CA 93101	145.6	232,900	Roof-top (Net-metering)
Public Works/Planning Office	630 Garden St, Santa Barbara, CA 93101	100.5	158,640	Roof-top (Net-metering)
Santa Barbara County Mental Health	1136 E Montecito St, Santa Barbara, CA 93103	83.1	133,601	Roof-top & Carport (Net-metering)
219 W Micheltorena St	219 W Micheltorena St, Santa Barbara, CA 93101	3.0	5,351	Roof-top (Net-metering)
2410 Stanwood Dr	2410 Stanwood Dr, Santa Barbara, CA 93103	12.8	19,970	Roof-top (Net-metering)
Braemar Life Station	1 Alan Rd, Santa Barbara, CA 93109	1.5	2,621	Roof-top (Net-metering)

Eastside Library	1102 E Montecito St, Santa Barbara, CA 93103	11.0	17,620	Roof-top (Net-metering)
Fire Station 15	2491 Foothill Rd, Santa Barbara, CA 93105	9.5	13,700	Roof-top (Net-metering)
Groundwater Treatment Plant	220 E Ortega St, Santa Barbara, CA 93101	2.3	3,336	Roof-top (Net-metering)
Airport Hangar	495 S Fairview Ave, Goleta, CA 93117	454.3	700,900	Carport & Rooftop (Net Metering)
Pershing Park	100 Castillo St, Santa Barbara, CA 93101	430.2	666,700	Carport (Wholesale/ Community solar)
Vic Trace Reservoir	Vic Trace Reservoir, Santa Barbara, CA 93109	1,970.0	2,921,000	Ground-mount (Wholesale/ Community solar)
Airport Overflow Lot	140 Frederick Lopez Rd, Santa Barbara, CA 93117	2,270.0	3,487,000	Carport & Ground-mount (Wholesale/ Community solar)
Golf Club		487.2	721,100	Carport (Wholesale/ Community solar)

Table 2: Private Sites Surveyed

Site Info		PV Info		
Site Name	Address	PV Size (kW)	PV Output (kWh)	System Type
La Cumbre Plaza	121 South Hope Avenue, Santa Barbara, CA 9310	2,510	4,249,010	Carport & Rooftop
Trader Joe's - Milpas Street	222 N Milpas Ave, Santa Barbara, CA 93103	290	489,386	Carport & Rooftop
SBMTD - Olive Street Yard	550 Olive St, Santa Barbara, CA 93101	244.5	406,976	Carport
Smart & Final + OfficeMax	217 E Gutierrez St, Santa Barbara, CA 93101	327.3	541,100	Rooftop
Garden and Yanonali	132 Garden St #16, Santa Barbara, CA 93101	459.3	687,800	Rooftop
Santa Barbara YMCA	36 Hitchcock Way, Santa Barbara, CA 93105	273	488,979	Carport & Rooftop
“Beaver Tree” Facility	130 Garden St, Santa Barbara, CA 93101	554	859,839	Carport & Rooftop
Whole Foods - State Street	3761 State St, Santa Barbara, CA 93105	237	425,128	Carport & Rooftop
Calvary Chapel Facility	1 N Calle Cesar Chavez, Santa Barbara, CA 93103	766	1,137,220	Carport & Rooftop
Trader Joe's - De La Vina Street	3025 De La Vina Street, Santa Barbara, CA	37.8	61,928	Rooftop
Playback Recording Studio (& surrounding facility)	400 Gutierrez St, Santa Barbara, CA 93101	320	510,774	Carport & Rooftop
Hilton Beachfront Resort	633 E Cabrillo Blvd, Santa Barbara, CA 93103	695	1,136,820	Carport & Rooftop
MarBorg Industries	119 N Quarantina St, Santa Barbara, CA 93103	36	57,870	Rooftop
Mission Creek Plaza Shopping Center	2840 De La Vina St, Santa Barbara, CA 93105	361.3	589,100	Carport & Rooftop

El Escorial Condos	354 Por La Mar Cir, Santa Barbara, CA 93103	244.8	403,600	Rooftop
Santa Barbara Zoo	500 Ninos Dr, Santa Barbara, CA 93103	542.5	897,000	Carport
Santa Barbara City College	721 Cliff Dr, Santa Barbara, CA 93109	1,270	2,063,000	Carport & Rooftop
Grace Church	935 San Andres St, Santa Barbara, CA 93101	73	120,500	Carport & Rooftop
LawCopy and Rape Crisis Centers	411 E Canon Perdido St #15, Santa Barbara, CA 93101	219.8	358,400	Carport & Rooftop
Milpas Shopping Center	53 S Milpas St, Santa Barbara, CA 93103	304.8	499,700	Carport & Rooftop
Anapamu and Nopal	729 E Anapamu St, Santa Barbara, CA 93103	168	277,200	Carport

Appendix IV – Public Survey Results

Throughout the SEP process, the Project Team performed a public survey to gauge the opinions of SEP in the general public, beyond the traditionally engaged stakeholders, through several core questions. The results are reported here.

Community Support for SEP Issues

Positive public opinion is required for any and all viable pathways to public funding discussed in Appendix V. Throughout the SEP process the interested public was interviewed and engaged in dialogue in order to gauge their willingness to make an investment that will fund renewable energy projects and electrical system resilience in Santa Barbara. However, to avoid obvious biases of self-selecting individuals, a random sample of the disinterested public (i.e. not self-identified as interested in energy) was surveyed in-person and by phone at various locations across the city and at various times of day. The demographics of the random sample set are shown in the charts below:

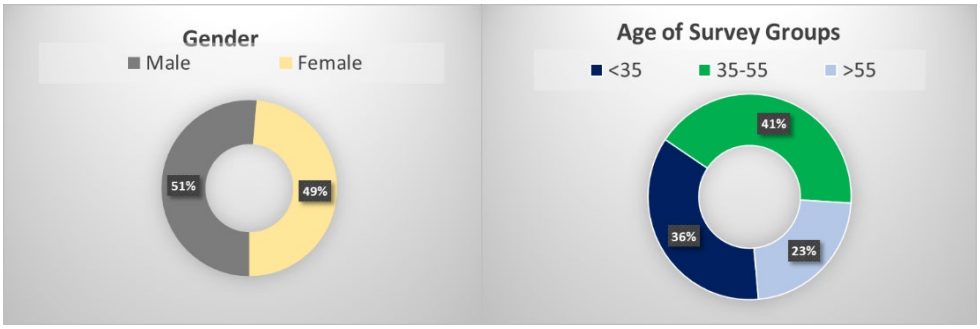


Figure 5: Public Survey Demographics

- Do you support a division focused on energy; a **One-stop-shop** at the local City level that could provide information or programs about energy? Such as disaster resiliency, reliable electricity, electric rates, rebates, incentives, and permitting and installation guidelines.
- As an alternative to electric company options, do you support the City playing a **Larger Role** in clean energy initiatives?
- Do you feel that residents or businesses in the City should get recognition for taking positive energy actions like **Energy Efficiency**?

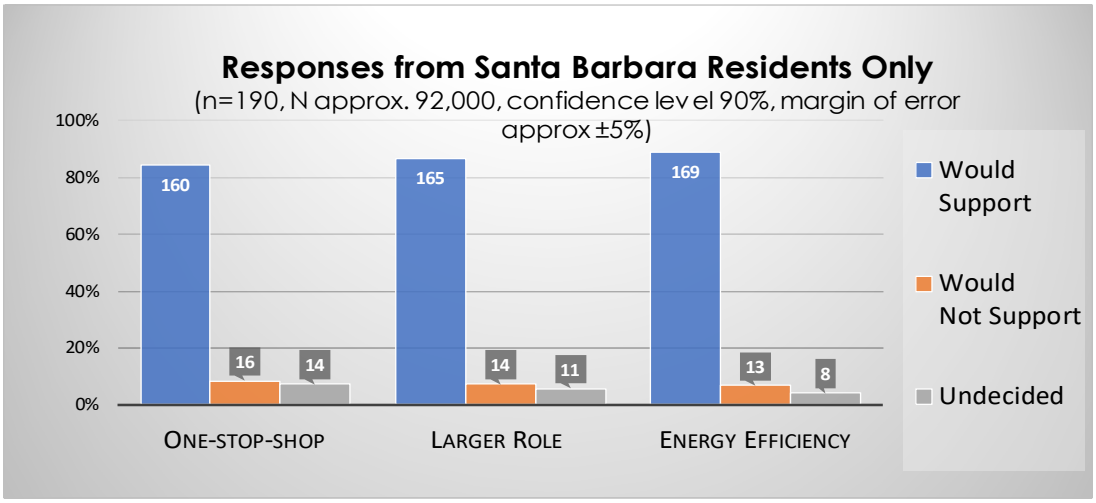


Figure 6: SEP Public Survey Responses - Residents Only

Public Receptiveness to Energy Investment

After the first three topic questions were asked, the random survey participants were asked about a local **Energy Investment** framed as a general fee focused on improving resilience throughout the Santa Barbara community. All participants were asked if they would support a resilience fee with no given dollar amount and a smaller sample were also given a single option (either $1 per household per month, or $10 per household per month). It is important to note that participants were not given a choice, just a single option. The results showed that for a fee of $1 per household per month 68% would support; for an unspecified fee 51% would support; and for a fee set at $10 per household per month only 28% would support.

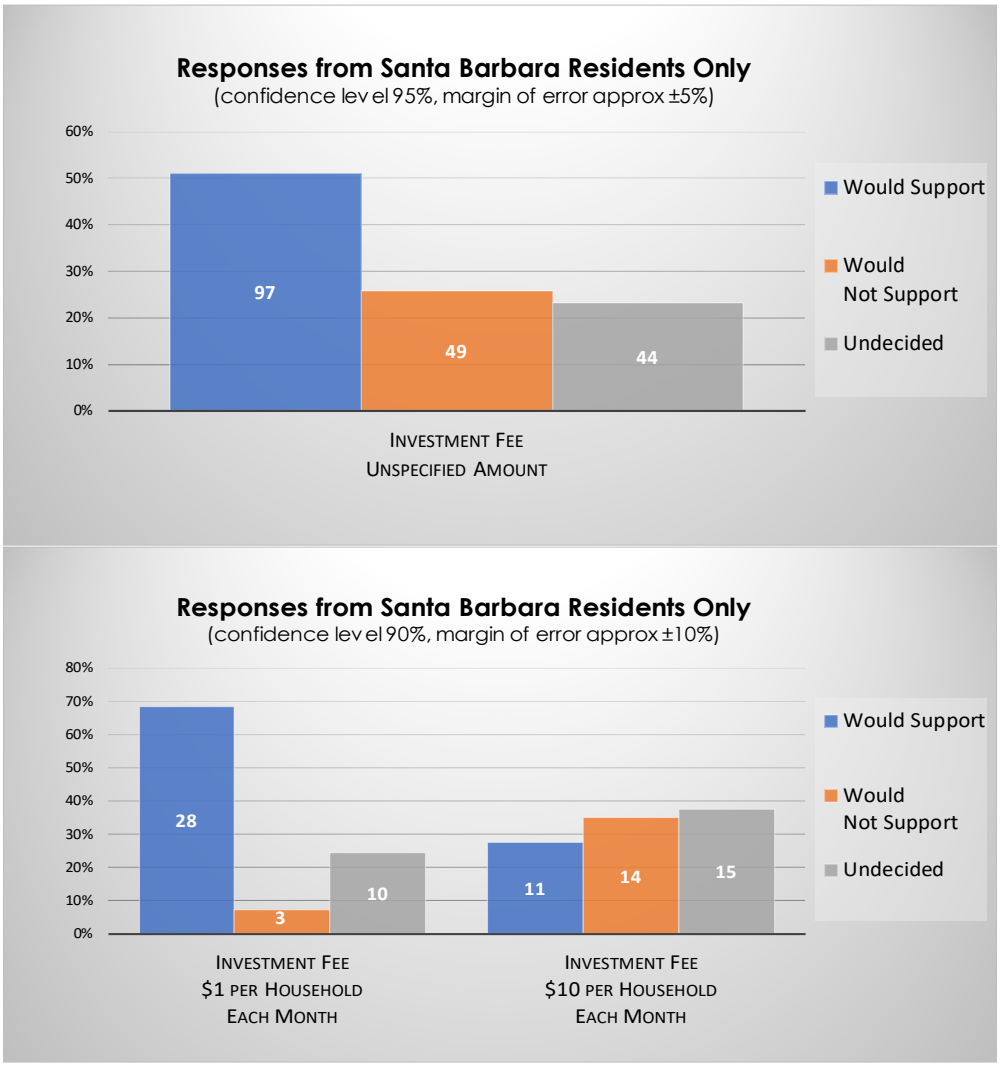


Figure 7: SEP Public Survey Responses - Resilience Investment Fee - Residents Only

These results indicate that while there is relatively strong support for a resilience fee in some form, the amount of that fee has significant impacts on that support. Further polling and community engagement may be needed as part of the planning and implementation of a resilience investment fee, but these results indicated enough public appetite to support the viability of implementing the options discussed in the following section.

Appendix V – Municipal Revenue Raising Strategies

Given the long-term nature of Santa Barbara's commitment to renewable energy, successful achievement of the City's energy goals may require new funding sources that can sustain policy and program implementation into the future. Figure 5 illustrates the shortfall between the current investment in energy efforts (1.5 FTEs) and the annual budget through 2030 needed to cover SEP implementation.

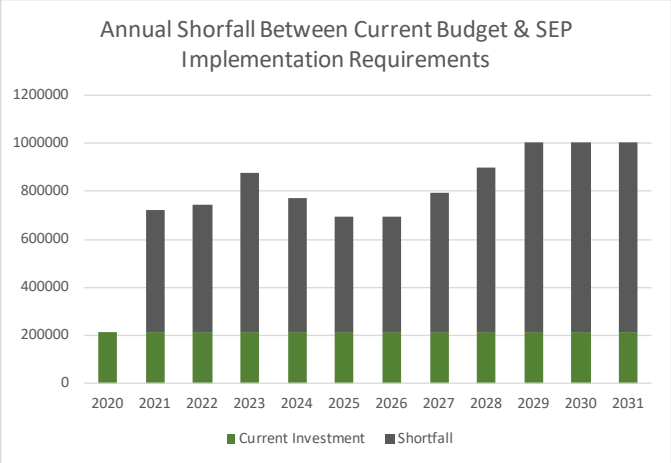


Figure 8: Current Energy Budget vs Estimated SEP Implementation Budget

As discussed in the Strategic Energy Plan Budget, the City intends to fund SEP implementation by reallocating existing funds based municipal electricity use. However, if necessary, the City has several options to establish a consistent funding source to fund SEP implementation.

Each option can be designed to protect public safety and preserve economic vitality by funding staff and programs focused on electrical system resilience and renewable energy development. A consistent funding stream can be designed in a variety of ways that differ in scale, collection method and flexibility to spend, while maintaining the same mission. The funding options discussed in this section are not necessarily mutually exclusive. If the need arises, City staff and City Council should weigh the tradeoffs of each option to create a path forward that works for the entire Santa Barbara community.

Carbon Tax & the SEP

A carbon tax (sometimes called a carbon fee) is a cost imposed on the usage of carbon-based fuels such as oil, gas and coal. It is a method of pricing the negative impacts that carbon emissions cause and ensuring that those responsible for the emissions pay for those damages.

At the municipal level, electricity has been used as a proxy for carbon emissions because of the historically high carbon intensity of the fuels used to generate electricity throughout the country and the administrative burden of implementing a carbon tax at the local level. In California, however, the carbon intensity of the electricity mix is lessening, meaning that electricity may not be the best proxy for carbon emissions in the future.

Since the SEP focuses on the electricity sector, and there are other reasons for a transition to renewable energy besides addressing climate change, the revenue raising mechanisms described in this document focus on maintaining a close nexus with electricity use. However, as Santa Barbara expands its climate efforts moving forward and the administrative burden of a local carbon tax persist, a shift toward revenue raising mechanisms with a closer proxy to a carbon tax, such as increasing the Utility Users Tax on natural gas, may make sense for the City and its community.

Fees vs Taxes

In general, long-term funding options fall in to two categories; fees and taxes. The primary tradeoff between these two types of funding options is the difficulty of implementation and the strength of the nexus between the funding source and the funded programs. Fees are established by City Council but must have a strong nexus between the funding source and the funded programs to maintain legality and avoid appearing as a "hidden tax". Taxes are established by a popular vote but allow wider flexibility around the funding source and funded programs nexus.

Within the context of the SEP, the nexus flexibility provided by a tax may be appealing. The SEP prioritizes capacity building within the City organization and calls for the formalization of an Energy & Climate Program within the City. The ECP creates capacity to expand renewable energy efforts beyond the electricity sector into other climate related areas, such as the transportation sector. A tax could likely fund expanded programs, whereas a fee, tied directly to an electricity initiative, may be legally unable too. Additionally, if a tax is passed through popular vote, that vote also serves as evidence of widespread public support which can be valuable to the City.

Prioritizing Reliability & Resilience

Generally, taxes designed to support renewable energy and climate efforts in other parts of the country have been called Climate Action Plan Taxes or give other appropriate climate and energy related names. However, given the relationship between the electrical grid and the recent natural disasters in Santa Barbara and significant resilience concerns in the region, a tax focused on improved grid resilience would be appropriate for the City and would demonstrate the City's commitment to protecting its community and improving public health and safety. To further these priorities, the City could also build in revenue spending stipulations, if necessary, given the style of tax or fee that prioritize resilience and reliability investments.

Prioritizing Equity

As with any tax or fee, equity and affordability are key issues to consider. The SEP strives to include equity throughout its strategies to ensure that it is prioritized as the City invests in its community. Some of the SEP programs, such as outreach campaigns and DER development at critical facilities help the entire community, and some SEP strategies are designed to directly help renters and low-income communities. However, those communities may still have limited ability to benefit from SEP programs due to the difficulties they face in investing in energy efficiency and renewable energy. Thus, all funding mechanisms should include language requiring a portion of the revenue raised to be applied to SEP programs that specifically help renters and low-income communities, in order to avoid those communities bearing a burden of SEP funding without receiving any benefits.

Estimating the Community Tax Burden

In order to provide further insight into the impacts of each revenue raising option, this document provides an estimate of the tax or fee amount required to fund certain portions of the SEP implementation budget. These amounts were estimated using the average annual amount for the following portions of the budget:

Total Program Investments: Estimated capital costs required to run all programs discussed in the SEP

Total Project Investments: Estimated capital costs required to fund the municipal DER projects discussed in the SEP

Total Annual Budget Request (Direct to Implementation): Total additional budget requested each year to fund the programs and projects discussed in the SEP as well as the Energy & Climate Program staff time directly applied to SEP implementation

Total Annual Budget Request: Total additional budget requested each year to fund the programs and projects discussed in the SEP and all staffing associated with the Energy & Climate Program

Option 1: Utility Users Tax Increase

Background & Description

The City could increase the Utility Users Tax applied to electricity, and natural gas if desired, with the specific purpose of funding SEP implementation and addressing electrical grid resilience and reliability concerns in the City.

A Utility Users Tax is a general tax levied on residential, commercial and industrial utility customers based on their utility charges (amount billed) for electricity, natural gas, water, waste collection and telecommunications. The tax is collected by the utility provider via existing utility bills and remitted to the City. Santa Barbara currently has a Utility Users Tax of 6% collecting about $7.8 million in revenue for the City's general fund, about 5% of total General Fund Revenues.[17]

Additional Considerations

Potential for Burden Reduction: While not exclusively tied electricity usage, given the additional components of an electricity bill beyond usage that the tax is applied to such as minimum monthly charges[18], this option does offer some ability for the parties required to pay the tax to reduce their burden by reducing their electricity usage. This may be an important feature to gain public approval.

Implementation Tradeoffs: This option presents a tradeoff between ease of implementation and control over the tax design. Since this option raises revenue by adding to an existing tax it will not require the City to establish a new collection mechanism, but the City may not have the ability to included innovative design features such as those discussed under Description & Considerations for Option 2 – Excise Tax on Electricity Consumption

Revenue Impacts of SEP Strategies: It is also important to note that SEP strategies designed to support energy efficiency and DERs will reduce the revenue collected through this tax, unless rates are raised.

Precedent

This tax already exists and provides important revenue to the City's general fund. Santa Monica levies a 10% utility users tax on electricity, compared to the 6% that Santa Barbara currently levies.[19]

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[17] City of Santa Barbara Adopted Operating and Capital Budget for Fiscal Year 2019. June 27, 2018. https://www.santabarbaraca.gov/gov/depts/finance/budget/adopted.asp

[18] Santa Barbara Municipal Code, Chapter 4.24, p. 68 https://www.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=17434

[19] "Utility Users Tax". City of Santa Monica. Accessed April 24th, 2019. https://finance.smgov.net/fees-taxes/utility-users-tax

Community Tax Burden

	Total Annual Program Investments	Total Annual Project Investments	Total Annual Budget Request (Direct to Implementation	Total Annual Budget Request
Utility Users Tax Increase (%)	0.72%	0.65%	1.55%	2.27%

Applicable Funding Targets

Given its status as general fund revenue, this funding source could fund any aspect of the SEP through appropriation to the budget of a formalized Energy & Climate Program or other relevant department.

Option 2: Excise Tax on Electricity Consumption

Background & Description

An excise tax on electricity consumption is a tax levied on residential, commercial and industrial utility customers based on the amount of electricity they use. This tax would be levied on a per kWh basis. It would be collected by SoCal Edison and remitted to the City.

Additional Considerations

Potential for Burden Reduction: This option is similar to an increase in the Utility Users Tax, but it would be based on the amount of electricity used by a given party, not the amount of their utility bill. This is an important distinction because it provides parties paying the tax a more direct mechanism to reduce their tax burden compared to the Utility Users Tax which is based on the amount a party pays for their utilities. While this may be closely related to usage, it also includes other charges such as demand charges, customer charges and service charges. Additionally, as a new tax, the City would have control over all aspects of the design. These considerations are addressed below.

Setting the Rate: The tax could levy a fixed rate across sectors or vary based the rate on sector and the City can determine whether it should be highest for residential customers, commercial customers or industrial customers. These amounts can be adjusted to reduce the burden on high usage customers in the industrial sector. In the context of the SEP, the City's renewable energy goals and grid resilience goals, the City could structure the tax by matching the percentage of total tax revenue contributed to the percentage of the total electricity load contributed by a given sector.

Revenue Impacts of SEP Strategies: It is important to note that, like the Utility Users Tax, SEP strategies designed to support energy efficiency and DERs will reduce the revenue collected through this tax, unless rates are raised.

Utility Partnership: In order to implement this option, the City will need to determine the willingness of SoCal Edison to collect new tax. SoCal Edison already collects and remits the Utility Users Tax so there may be no concerns. However, since the utility would likely receive the majority of questions from customers and undertake any increase in administrative burden this would still need to be addressed.

Gas Usage: Theoretically, the City could levy a tax on natural gas usage. From a climate perspective this approach makes sense, as the carbon intensity of the electricity supply in Santa Barbara is projected to decrease (see Carbon Tax sidebar). However, since the SEP is focused specifically on electricity usage the funding nexus is stronger if the tax is levied on electricity.

Levying a tax on natural gas usage would also require cooperation with SoCal Gas. If the tax is being used to fund programs that decrease gas usage (through building electrification, for example) there may be little interest on the part of SoCal Gas to cooperate.

Community Choice Aggregation: In the event that the City establishes a CCA this tax could continue to be collected. However, the CCA would likely consider the funding of parts of SEP implementation when structuring its rates potentially enabling the City to reduce tax rates. If the City decides a CCA should be responsible for the majority of SEP implementation, then an additional tax on electricity may not be necessary.

Possible Exemptions: Given the City's goal of achieving 100% renewable energy, customers or who opt into 100% renewable programs provided by SoCal Edison could be exempted from the tax. This exemption would also apply for CCA programs if the City maintained the tax.

Precedent

The leading example of an electricity tax to fund renewable energy and climate efforts is Boulder, Colorado. Boulder passed their CAP tax in 2007 after a long study period and search for a long-term funding mechanism to support their carbon reduction activities.[20] The tax has been renewed multiple times by voters and is currently scheduled to expire in 2023.[21]

Boulder structured it rates using by aligning the amount each sector pays with the amount of funding that sector receives from the resulting City program. This a model that Santa Barbara could use.

Community Tax Burden

	Total Annual Program Investments	Total Annual Project Investments	Total Annual Budget Request (Direct to Implementation	Total Annual Budget Request
Electricity Usage Tax ($/kWh)	$ 0.001	$ 0.0009	$0.0021	$0.003
Average Monthly Expense[22]	$0.25 – 0.35	$0.225 – 0.315	$0.53 – 0.735	$0.75 – 1.05

[20] Brouillard, Carolyn and Sarah Van Pelt. *A Community Takes Charge: Boulder's Climate Tax.* City of Boulder. (February 2007). https://www-static.bouldercolorado.gov/docs/boulders_carbon_tax-1-201701251557.pdf

[21] City of Boulder. *Boulder Climate Action Plan Tax Fact Sheet* https://www-static.bouldercolorado.gov/docs/CAP_document_2017_updated_FINAL-1-201807170904.pdf?_ga=2.230191068.1907838852.1554387288-1167298458.1551401313

[22] Based on a range of household electricity usage in Santa Barbara of 250 – 350 kWh per month.

Applicable Funding Targets

As a general tax the City could use revenues generated from this option for any aspect of the SEP through appropriation to the budget of a formalized Energy & Climate Program or other relevant department.

Option 3: Tax on Gross Retail Sales

Background & Description

The City could implement a tax on the gross retail sales of large corporations in Santa Barbara and remit the proceeds to a specific fund that supports renewable energy projects and SEP implementation. The City can determine a specific definition of a "large corporation" and determine exactly which types of retail sales will qualify under the tax. For example, Portland, Oregon (discussed below) defined "large corporation" as a corporation having over $500,000 of annual sales within the City limits and $1 billion in annual sales total. Exemptions on retail sales were made for products such as groceries, medical equipment and utilities. If this option is pursued, City staff should review the business activity within Santa Barbara to determine the appropriate definitions and exemptions.

Additional Considerations

Centering Equity: A tax that increases the cost of doing business in Santa Barbara may not be appealing. Taken through an equity lens, however, this option may become more feasible. By limiting the tax increase to the largest companies operating within Santa Barbara and earmarking the funds for specific policies and programs that are focused on equity and low-income communities the City can ensure that its communities most impacted by climate change and with the most difficulty capturing the benefits of renewable energy can see benefits from the SEP

Legal Incidence: It is important to note that the legal incidence of this tax increase, who is responsible for paying, would fall on the businesses, meaning that if they chose to pass those increased costs to their customers, as they saw fit, those additional revenues would also be eligible to be taxed.

Additional Exemptions: To operate within the City of Santa Barbara each business must obtain a license and pay a business license tax based on the amount of gross sales realized by that business in the year prior. The amount paid under this tax should be eligible for deduction under this option. Additionally, the Strategy 5.3: Energy Performance & Disclosure Policy includes discussion of an optional business tax increase to incentivize energy efficiency investment. Any increase paid in this scenario should also be exempt from a broader tax on gross retail sales

Precedent

In 2018 Portland, Oregon passed the Portland Clean Energy Initiative, establishing a 1% tax on the gross revenue generated in the city by large retailers.[23] This tax is expected to yield about $30 million annually

[23] Guevarra, Ericka Cruz. "Portlanders Pass Measure to Create Clean Energy Fund". Oregon Public Broadcasting (November 6, 2018). https://www.opb.org/news/article/portland-oregon-clean-energy-gross-receipts-tax-result/

for investment in clean energy projects.[24] These revenues will be managed by a committee and dispersed to the community through grant programs. These grant programs have specific requirements mandating that a certain portion of the funds be spent in disadvantaged communities most affected by climate change.[25]

Community Tax Burden

An estimate of the financial impact on the community is not provided for multiple reasons. First, data on gross revenue for the largest retailers in Santa Barbara is not immediately available. Second, this tax would not affect the vast majority of the Santa Barbara community, as it would only be applied to select large corporations. Finally, revenue collected by the City through this tax would most likely be used on specific projects related to equity, instead of general SEP implementation.

Applicable Funding Targets

Funds raised through this option can be used to fund any aspect of SEP implementation, but the funding nexus may be strongest with the equity-focused portions of the SEP including Strategy 2.1, Strategy 3.1 and Strategy 3.2.

Option 4: Sales & Use Tax Increase - Special Tax or General Tax

Background & Description

In 2018 voters in Santa Barbara approved Measure C, a ballot measure adding 1% to the Sales & Use Tax for the general purpose of improving the City's aging infrastructure. Measure C took effect on April 1, 2018 and is expected to raise about $22 million each year in revenue for the City. [26] The City could look to replicate this process to fund the SEP, but the percentage increase would be much smaller than the 1% added through Measure C (see Fiscal Impacts table below). Alternatively, the City could propose a special tax added to the sales tax to create a fund dedicated to public safety through grid resilience and renewable energy development.

Additional Considerations

General Tax vs Special Tax: Replicating Measure C directly, albeit with a smaller increase, would mean passing a general tax. The benefits of a general tax are that they only require a simple majority to pass and the City has wide flexibility in where to appropriate the revenues within its budget. A special tax differs from a general tax in that its revenues must be used for a certain purpose and kept in fund separate from the general fund. Special taxes require a two-thirds vote in a general election. While there is increased difficulty in passing a special tax, special taxes are one of the most common methods for a municipality to raise revenue.[27] Given that Santa Barbara recently raised its sales tax, a special tax that has specific limits around how those funds can be used may be publicly appealing. It would also ensure that SEP funding was protected from appropriation to different purposes.

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[24]Portland Clean Energy Initiative. "Process Flowchart". Accessed April 10, 2019). https://static1.squarespace.com/static/5b847fe4f8370ad8f30a8cac/t/5ba3324d2b6a28141fa236c6/1537421902653/PCEI+Flow+Chart.pdf

[25]Ibid.

[26] Nguyen, Vicky. "Santa Barbara New Sales Tax Rate will take effect April 2018". (November 8, 2017). https://www.keyt.com/news/money-and-business/santa-barbaras-new-sales-tax-rate-will-take-effect-april-2018/653551134

[27] California Institute for Local Government. *Basics of Municipal Revenue.* (2016). https://www.ca-ilg.org/sites/main/files/file-attachments/basics_of_municipal_revenue_2016.pdf

Precedent

Sales tax increases are common method for municipalities to raise revenues. As discussed above, Santa Barbara recently raised its sales tax to replace aging infrastructure and provide critical services. The public safety and community protection provided by the resilience and reliability benefits of the SEP strategies is not dissimilar from the purpose of Measure C.

Community Tax Burden

	Total Annual Program Investments	Total Annual Project Investments	Total Annual Budget Request (Direct to Implementation	Total Annual Budget Request
Sales Tax Increase (%)	0.04%	0.05%	0.11%	0.16%

Applicable Funding Targets

As a general tax, an increase in the Sales & Use Tax could fund any aspect of SEP implementation. As a special tax, revenue use would be limited to the specific purposes of the fund established. In the example discussed above, that fund would focus on increased grid resilience and fund implementation of SEP strategies related to that including Strategy 3.1, Strategy 4.1 and Strategy 4.2.

Option 5: Special Assessment

Background & Description

Special assessments are a charge imposed on specific properties through the property tax to fund projects that benefit those properties[28]. In California, they are often used to fund special districts that lack the opportunity to charge an enterprise fee for services such as water districts, open space districts, library districts or fire districts[29]. About two-thirds of the funding for special districts in California comes from property taxes and special assessments.[30]

Additional Considerations

Proposition 218: Proposition 218, passed in 1996, established specific tests for determining how an assessment is benefitting the properties it is applied to, and placed the burden of proof on the agency applying the assessment[31]. This means, primarily, that the special assessment must be accompanied by an engineering report that justifies the assessment and separates the special benefits from the general benefits

[28] League of Minnesota Cities. *Special Assessment Toolkit.* (August 8, 2018).
[29] CA-ILG, Basics of Municipal Revenue. 2016.
[30] Ibid
[31] League of California Cities. *Propositions 26 and 218: Implementation Guide*, p.17. (May 2019). http://www.cacities.org/Prop218andProp26

to the community at large.[3233] In the case of the Smart Energy Zone, the general benefits of a special assessment could be increased disaster resilience through local electrical generation and economic savings realized by property owners from DER installation. The special benefits could be infrastructure improvements made to properties as part of pilot programs. Examples include critical load circuits and microgrid development. As the City designs the special assessment, additional legal review and classification of the Smart Energy Zones benefits would be needed. For example, it may be necessary for every parcel within the special assessment to receive a critical load circuit to meet the special benefit requirements of Proposition 218, a requirement that may be unfeasible.

Precedent

There are two special assessment districts already in existence in Santa Barbara, the Downtown Business Improvement District (BID) and the Parking Business Improvement Area.[34] The benefits provided in those Districts, particularly the BID, are not tied directly to infrastructure.[35] This indicates the City is familiar with the requirements of a special assessment, how to use them to fund programs and could likely apply that experience to the creation of district intended to fund SEP implementation.

Community Tax Burden

The financial burden on the community is not provided for the Special Assessment because it is not applicable to fund the entire SEP and would only apply to a specific section of the City. See discussion in Applicable Funding Targets below.

Applicable Funding Targets

A Special Assessment could be used as a strategy to fund Smart Energy Zone activities, depending on the vision for the SEZ established by the City and the community. The direct relationship between the properties being assessed and the benefits provided that is required to maintain the legality of a Special Assessment limit the applicable funding targets.

Option 6: Water Energy Nexus Funding: Bill Adder or Parcel Tax

Background & Description

The water-energy nexus is a documented concept describing the interconnected nature of the water and electricity sectors[36] that is discussed throughout the SEP. This nexus establishes the reasoning to establish an ongoing and stable revenue raising mechanism to fund the development of renewable, resilient energy projects within the Santa Barbara water system which contribute to community water service reliability.

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[32] Ibid, p. 38

[33] From the California Constitution, Article XIII D, § 2, via the Proposition 218 Implementation Guide, a special benefit is defined as "a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large. General enhancement of property value does not constitute 'special benefit" (p. 39). A general benefit is defined in the Constitution, but the Prop 218 Implementation Guide notes two categories of general benefits; benefits to individuals instead of real property and benefits to property inside and outside of the district (p. 39).

[34] "Business Improvement Districts". City of Santa Barbara. Accessed February 12, 2019. https://www.santabarbaraca.gov/business/license/bid/default.asp

[35] Ibid.

[36] International Energy Agency. *Water-Energy Nexus, Excerpt from the World Energy Outlook.* (2016). https://www.iea.org/publications/freepublications/publication/WorldEnergyOutlook2016ExcerptWaterEnergyNexus.pdf

The City's increased reliance on and investment in the energy intensive process of desalination increases that need.[37] The City can consider creating this funding mechanism in two ways; adding line item on the water utility bill or creating a parcel tax. As with any comparison between a fee and a tax, the bill adder could be implemented through approval from City Council and the parcel tax would need to be passed through a public vote.

While there is a clear purpose and need for this revenue raising mechanism, it is important to note that the complexity of the City Water System and its water supplies mean that the general cost of water is significant. Thus, any additional costs added for funding energy projects may be unpalatable due to the public, particularly if they are directly tied to the Water Bill.

Additional Considerations

Setting the Rate: SEP Document 4: Municipal Resource Potential includes a project proposal for a Water System Energy Master Plan. One of the items in that proposal is a determination of a reasonable recurring electricity resiliency investment and associated bill adder directly tied to water quality and reliability. This process will enable the City to set an appropriate bill adder or parcel tax.

Alternatively, the City could choose a uniform rate (e.g. $1 per month per account) designed to provide a certain amount of funding for a specific project or purpose. Using the $1 per month example, the City would see about $385,000 in annual revenue. This would likely be sufficient to fund a combination of the Water-Energy Analyst salary and the costs associated with a PPA for distributed energy resources.

Precedent

In 2016 the nine counties surrounding the San Francisco Bay implemented a $1 per month clean water parcel tax to fund restoration projects surrounding the bay.[38] This measure was petitioned for reasons of both resource protection and climate mitigate and passed with a 70% majority. The parcel tax discussed here would enable the City of Santa Barbara to raise revenue in the same manner, albeit at a smaller scale.

Community Tax Burden

The financial impacts on the community are not estimated because of uncertainty surrounding the best mechanism for water – energy nexus funding. This can be determined via Water Energy System Master Plan, as discussed above.

Applicable Funding Targets

An adder to the water bill could be used to fund a portion of the ECP staffing, specifically the Water – Energy Analyst and renewable energy projects in the water system (See Strategy 4.1).

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[37] "Desalination". City of Santa Barbara. Accessed January 12, 2019. https://www.santabarbaraca.gov/gov/depts/pw/resources/system/sources/desalination/default.asp

[38] "Parcel Tax Information". San Francisco Bay Restoration Authority. Accessed March 13, 2019. http://sfbayrestore.org/sf-bay-restoration-authority-parcel-tax.php

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