CITY OF SOLANA BEACH: COMMUNITY CHOICE AGGREGATION TECHNICAL ANALYSIS

PREPARED BY:

CALIFORNIA CLEAN POWER

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California CLEANPOWER

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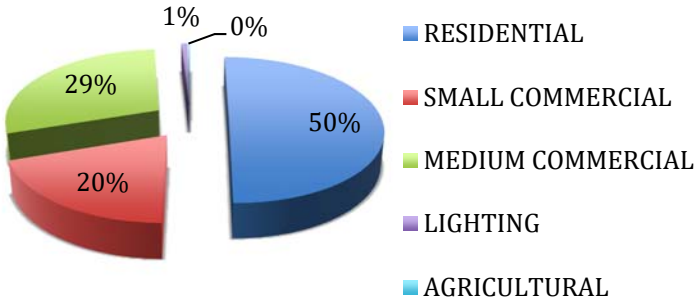
Executive Summary

Community Choice Aggregation (CCA) is operating successfully in California and in other states. Existing programs have demonstrated the substantial benefits of CCA for residents and businesses, the environment, and the economy. This analysis details how the City of Solana Beach (City) could establish a program that reaps the benefits of this growing public power movement for its residents and businesses.

To support the City's desire to establish CCA, this report provides general background and context for CCA, program development considerations, analysis of recent City energy load data and energy markets, analysis of scenarios identified as a priority by the City, and various CCA implementation and regulatory considerations.

2016 Solana Beach Energy Use, Customer Class



Solana Beach has approximately 7,800 electric customers projected for 2016. While most customers are residential, approximately half of energy used is by commercial customers (small and medium commercial combined). Scaling Solana Beach energy consumption information to the SDG&E system-wide load shows that Solana Beach represents approximately 0.4% of the SDG&E system, and approximately 18 MW of peak load.

The City of Solana Beach is an environmental leader, having adopted an official goal of using 100% renewable resources for its energy needs, and identifying CCA as a primary opportunity for achieving that goal. Working with elected officials and staff members of the City of Solana Beach, California Clean Power developed four scenarios for this analysis. The

City's expressed interest is to have the highest renewable portfolio financially possible for its CCA. The first scenario presents a portfolio that tracks State regulatory requirements for renewable resource procurement. This scenario provides a baseline to help benchmark other scenarios, which is comparable to renewable energy delivered currently by San Diego Gas and Electric (SDG&E). The other three portfolio scenarios contain higher levels of renewable resources consistent with the City's priorities. A summary of each scenario is outlined below.

Supply Scenario	Description	Renewables in Portfolio
Scenario 1	Baseline	Compliance (33% to 2020, 35% in 2021)
Scenario 2	Competitive rate, high renewable	Ambitious (50% in all years)
Scenario 3	High renewable	Aggressive (75% in all years)
Scenario 4	Maximum renewable	Maximize (100% in all years)

Scenario 1 (S1): Baseline. This scenario includes 33% renewables energy through 2020, increasing to 35% in 2021, in accordance with the California Renewable Portfolio Standard (RPS) requirements. This mirrors SDG&E's current renewable portfolio. This scenario serves as a contextual baseline, allowing Solana Beach to compare costs to existing SDG&E rates, as well as benchmark the cost and value of increased renewable procurement in different scenarios.

Scenario 2 (S2): Competitive Rate, High Renewable. This scenario assumes a level of renewable energy (50%) that is a significant increase above that currently delivered by SDG&E.

Scenario 3 (S3): High Renewable. This scenario is an aggressive move toward renewable energy (75%), placing Solana Beach ahead of virtually every jurisdiction in California and the country for renewable energy consumption.

Scenario 4 (S4): Maximum Renewable. This scenario maximizes renewable energy (100%). If launching or achieving this level soon after launch, the City of Solana Beach CCA would be the first 100% renewable CCA in California.

The analysis in this report demonstrates that the City of Solana Beach can implement a financially feasible CCA providing significant benefits to customers in the form of rate savings and increased renewable energy. In addition, by keeping revenue within the City, there can be increased economic activity and incentives for further renewable energy development.

Setting rates at a level that would produce cost parity with SDG&E provides an economic baseline for this analysis. In this case, the City's CCA could save approximately $1.4M for its ratepayers on an annual basis, or a nominal total of approximately $8.5 million over the course of 5 years of operation factoring cost and growth assumptions. The City can use those funds in a variety of ways, such as increasing the CCA's renewable portfolio percentage, increase customer rate savings, or implementing energy programs that are beneficial to customers.

Using program revenue to increase the CCA's renewable portfolio also has the direct environmental benefit of greenhouse gas (GHG) reductions. Based on SDG&E's current renewable portfolio of approximately 33%, increasing this to between 50% and 100% would remove the equivalent of between 1,900 and 7,700 passenger cars a year, not burning between 10 million and 39 million pounds of coal, or preventing the amount of CO_2 sequestered by between 7,600 and 30,000 acres of forest annually. The table below details the projected benefits for each scenario.

Summary Benefits of Solana Beach CCA, 2017-2021				
	S1	**S2**	**S3**	**S4**
Renewable Portfolio	33%	50%	75%	100%
Average Approximate Potential Rate Reduction	0 – 9%	0 – 7%	0 – 3%	0 – 1%
Retained CCA Revenue 2017-2021	$6,785,100	$5,350,900	$3,241,700	$2,338,700
Annual CO_2 Emissions (MTCO)	36,960	27,582	13,791	0
Annual CO_2 Savings (tons)	N/A	9,378	23,169	36,960
Annual Passenger Vehicles Driven	N/A	1,974	4,878	7,781

Energy and capacity prices in the wholesale market are currently very low, allowing for substantial customer savings and Community revenue generation. Prices are currently well below the SDG&E power costs, which will provide Solana Beach with substantial flexibility and lower risk. Moving forward quickly toward implementation, and launching the City's CCA under the most favorable market conditions possible is highly advisable.

While the City of Solana Beach is too small to fund and staff a CCA in the same manner as other existing CCAs, the City can establish a CCA through a public-private partnership that delivers all of the financial and operational services needed, while maintaining full decision-making authority over customer rates and program offerings. The CCA, launched as a single-city entity, would open the door to expanding the City's program into a multi-jurisdictional, or regional, program.

There are some risks to launching and operating CCA for any government. However, these risks are known and have been successfully mitigated by operating CCAs. While this report provides the needed information for the City to move forward in developing a CCA, the City would be wise to carry out thoughtful and conservative planning prior to launching to develop specific program operations, procurement, and risk management plans.

It is important to note that Solana Beach has defined these scenarios as varying levels of purchased renewable grid power or Renewable Energy Credits (RECs), excluding locally built renewables, distributed renewables or energy efficiency from the analysis. Under Scenario 1, Solana Beach retained revenue would provide almost $6.8 M over five years to leverage investment in CCA-owned local renewables and efficiency, in addition to private financing for customer-owned renewables and efficiency. Under 20 or 30 year financing, this amount of annual revenue could leverage $27-$51M of local investment.

Additional analysis should be conducted to help the City of Solana Beach decide how to spend retained revenue, and which scenario to follow. Specifically, in the development of its CCA, the City of Solana Beach should consider how or whether to invest retained revenue in behind-the-meter resources that are not addressed directly in this analysis. Individual rate savings, GHG reductions, resilience of local resources, as well as various positive economic impacts can be achieved through these investments. While specific analysis of these options is not included this report, several options and considerations are highlighted for future consideration.

Introduction

California Clean Power (CCP) is pleased to provide the City of Solana Beach (City) this Community Choice Aggregation (CCA) Feasibility Analysis. The City requested this study to help its community, elected officials, and city management understand the potential for developing a CCA for the benefit of its residents and businesses through a cleaner, more diverse and cost-effective power supply.

CCP prepared this feasibility analysis at no cost to the City and with no obligation for the City to work with CCP in the future. The founders of CCP established the company with the sole purpose of assisting municipalities in successfully developing and implementing CCA programs throughout the state. Providing this report at no cost or obligation to the City aligns with the company's charter as a Benefit Corporation.

The intent of this feasibility report is to provide an overall context and foundational information on CCA, an analysis of the City's recent electrical load data and the wholesale energy market, an analysis of specific scenarios for a Solana Beach CCA, and an overview of the required developmental components for developing a program. When structured appropriately, with thoughtful risk management strategies and skilled expertise responsible for daily operations, the benefits of CCA are real with significant long-term economic and environmental benefits.

The study is organized in several sections, including:

Public Power and CCA. This section provides general background and context for CCA in California and the United States.

CCA Design. This section introduces the scenarios analyzed in the report, associated programs that can be implemented through a CCA, and cost considerations for program development and launch.

Load and Resource Assessment. This section provides an assessment of customer load requirements, and the energy supply anticipated to meet these requirements, including renewable resources.

Scenario Analysis. This section provides a comparison of various choices the CCA can make that impacts the community benefits, including rate discounts, funds available for investment, and increasing the CCA's renewable energy portfolio. It also provides sensitivity analysis on key factors that impact a CCA. In addition, this section discusses to methodology and assumptions used in the analysis.

Implementation Considerations. This section details the various regulatory and program considerations in establishing CCA.

Report Conclusions. This section provides an overall assessment of the analysis and options for establishing a Solana Beach CCA.

Community Choice Aggregation is operating successfully in California and in other states. Existing programs have proven the benefits of CCA for residents, businesses, the environment, and the economy. As the success of CCA takes hold in California, new options are emerging for jurisdictions to establish a program of their own. These options remove financial, size, and political barriers that have previously slowed the progress of CCA.

A barrier specific to City of Solana Beach is jurisdictional size. To operate a CCA with internal staff and multiple vendors, a jurisdiction generally needs a minimum of 100,000 people to generate enough rate revenue to fund the operational costs – including initial investment and working capital. This hurdle could be overcome by the City participating in a public-private partnership with an organization that provides all of the supporting services required.

California Clean Power, a Benefit Corporation, was formed in early 2015 for the sole purpose of expediting the formation of CCA programs throughout the state by establishing public-private partnerships to deliver all of the financial and operational services needed for CCA. These services are provided at a flat fee (in $/MWh) that is lower than the cost a jurisdiction would incur to start and operate the CCA without this partnership. At the same time, all program control, oversight, and transparency are retained by the CCA. Accordingly, financial analysis within this report includes a flat fee that is inclusive of program development, launch, and operations costs.

CCP used its proprietary financial model, combined with our experience in government, retail energy markets, energy resource planning, legal and regulatory, and finance sector to conduct the analysis in this report. The specific scenarios reflect our understanding of Solana Beach's goals and objectives for the report. San Diego Gas & Electric Company (SDG&E) provided all available energy load data, additional data and information came from various government and research organizations. California Clean Power developed all other assumptions. To the extent possible we used current information and assumptions for market conventional and renewable energy prices from commercial and public sources. We believe this analysis fairly and accurately represents the market and the potential for a Solana Beach CCA, but none of the information in the report represents a commitment or an offer for service. Should Solana Beach pursue a CCA, the assumptions should be further refined based on program and resource planning by the City.

Public Power and CCA

California has a long and robust tradition of public, or municipal, electric utilities. Some California municipal utilities have been in operation since as early as 1887, and currently approximately 46[1] serve close to 25% of all of California's electric consumption.[2] These public entities represent the entire spectrum of California communities, ranging from the largest provider, Los Angeles Department of Water and Power, which is California's third largest electric utility, to the City of Biggs Electric Utility, which serves a population of approximately 1,700 citizens.

In California most municipal utilities were succeeded by Investor Owned Utilities (IOUs), which include Pacific Gas and Electric, San Diego Gas and Electric, and Southern California Edison. Today, the IOUs operate as regulated monopolies, owning the transmission and delivery system as well as a portion of energy generation facilities. The remainder of utility energy is generally provided by a large number of privately owned wholesale electric generating companies.

The emergence of new municipal utilities in California or the expansion of existing territory has been virtually non-existent in recent times. This is largely due to the difficult process of municipalization, which includes incurring the cost of either building or acquiring electric facilities that include miles of transmission and distribution wires, substations, generation facilities, metering equipment for every customer, computer systems, service trucks, and call centers.

1 Information excerpted from: California Energy Commission www.energy.ca.gov/sb1/pou_reports/Publicly_Owned_Utility_Company_Programs.pdf

2 The Clean Energy Race. Wisland, Laura and Haya, Barbara. Union of Concerned Scientists (2012). www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_energy/The-Clean-Energy-Race-Full-Report.pdf

California Assembly Bill 117

In the aftermath of the California energy crisis, and recognizing that the suspension of Direct Access removed a valuable alternative to the very difficult process of municipalizing along with fact municipal utilities generally faired better than the IOUs, California passed Assembly Bill (AB) 117, the Community Choice Aggregation law. Community Choice Aggregation ("CCA", sometimes referred to as Community Choice Energy, or simply Community Choice) enables California cities and counties, jointly under a Joint Powers Authority (JPA), or individually, to supply electricity to customers within their borders.

While CCA has similarities to local power through municipal utilities, a fundamental difference established by AB 117, is a CCA does not own the transmission and delivery systems (i.e., the poles and wires). Instead, a Community Choice program is responsible for providing the energy commodity (i.e., the electrons themselves) to its participants, which may or may not entail ownership of electric generating resources. The energy is still delivered by the IOU. In addition, AB 117 and subsequent legislation (SB 790) established structures to encourage cooperation and to strictly regulate IOU opposition to communities attempting to establish, or already operating, a CCA.

Unlike Direct Access under AB 1890, which required each customer to specifically choose non-IOU service (i.e. to "opt-in") from a new provider, AB 117 gave communities the right to procure their own electric energy as an essential governmental function – like water, sewer, or garbage service. In this way, California established Community Choice as an "opt-out" service. This means all utility customers within the established boundaries are automatically customers of the local government's CCA unless they decide not to participate in the program.

CCA Benefits

The benefits of CCA have been discussed at the conceptual level and proven out in practical terms by operating programs. At the most basic level, these benefits can be organized into the three categories: environmental, economic, and local control.

Within California, Community Choice can increase the use of renewable energy, increase the demand for new renewable energy projects within the state, and provide a new avenue for the development of smaller-scale local renewable projects. Because of this, in part or in combination, CCA can be one of the most significant strategies to meet a community's – and the State's – greenhouse gas (GHG) reduction goals.[3]

The increase in renewable energy use arises from the community's ability to establish a renewable portfolio at a baseline service level, or at a premium level, that exceeds that of the IOU. Although subject to market price realities, existing CCA programs, along with analysis of potential CCA programs, have proven these benefits.

While sufficient renewable power exists to meet current obligations within the State, increasing demand for renewable power through CCA will spur the development of additional projects and clean energy jobs. In addition, communities interested in local generation and energy efficiency projects can leverage CCA revenue to create new projects or provide a stimulus to expand existing community projects.

A fundamental characteristic of CCA is that significant revenue generated by energy rates paid by a CCA's customers stays within the community. Numerous studies have demonstrated that keeping revenue local has a profound economic impact on the

3 California Governor Brown issued an executive order to reduce GHG levels by 40 percent below the 1990 levels by year 2030. (April 29, 2015) http://gov.ca.gov/news.php?id=18938

community. Further, if program revenues are leveraged to invest in local projects, as noted above, those investments can have a positive job-creation impact.

Because CCA can potentially both lower and stabilize electricity rates, the economic benefits extend to daily savings for individuals, businesses, and governments as well. Depending on energy use and specific offerings, these savings can be significant. Moreover, Community Choice programs have the ability to target rate reductions to attract business growth in their community or provide larger reductions to low-income residents.

Regardless of how the program is structured or operated, CCA delivers a level of public participation and control that is not currently available through an IOU. Implicit to this control is the introduction of consumer choice, an avenue of more direct and available input on services provided, and the opportunity to support the economy in a way that is not otherwise possible.

CCAs are required to have a governing board, with all of the public decision making processes and assurances required of government agencies. Because of this, no matter how the governments staffs or provides for daily operations of its CCA, key policy decisions remain within the public domain.

Community Choice in California

As of the date of this report, there are three successfully operating Community Choice programs in California; Marin Clean Energy (MCE), Sonoma Clean Power (SCP), and Lancaster Choice Energy (LCE). As the benefits of CCA are proven through successful operation, a growing number of jurisdictions in California are evaluating the concept or taking active steps to pursue CCA. Several programs, including in San Francisco, the San Mateo Peninsula, and the Silicon Valley are moving closer toward implementation, and many other jurisdictions are exploring the potential of a CCA.

Founded in 2010, Marin Clean Energy, operated by the Marin Energy Authority, a Joint Powers Authority (JPA), was the first operational CCA program in the state. MCE was introduced in several phases, with the first phase including about 8,000 accounts made up of residential, commercial, and municipal customers. In 2011, MCE enrolled another 5,500 accounts, the majority of which were residential, with a small number of commercial accounts. MCE completed customer enrollments within the Marin county borders in 2012. In 2013, MCE began offering electric service to the nearby City of Richmond customers. MCE continues to grow beyond the boarders of Marin, incorporating several jurisdictions in the Bay Area since 2015. Currently, MCE provides three options of renewable power at varying rates. The baseline service level includes 50% renewable power. Two optional levels of 100% renewable, and 100% local solar are also available at a premium rate.

Like MCE, Sonoma Clean Power is run by a JPA comprised of Sonoma County and all cities within the County, excluding the City of Healdsburg, which operates its own municipal power system.[4] Unlike MCE, SCP has focused its service exclusively within the jurisdictional boundaries of Sonoma County. Currently, SCP provides two options of renewable power for varying rates. The baseline service includes 33% renewable power, with an optional 100% renewable power available at a premium rate.

Both MCE and SCP have set the current baseline service rate under that of the IOU, Pacific Gas and Electric (PG&E). In addition, both have offered energy efficiency programs to customers. Reflecting the rates and program offerings, both MCE and SCP have strong support within their respective service areas with low "opt-out" rates.

The City of Lancaster launched the most recent CCA, LCE. LCE phased in service, with municipal accounts starting first, followed by commercial accounts, and finally residential

4 Participating cities include Cloverdale, Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

accounts. Based on its implementation plan, LCE provides 35% renewable power as its baseline service. The City of Lancaster funded LCE by establishing an enterprise fund backed by the City's General Fund.

CCA in Other States

In addition to California, five other states have authorized Community Choice, including Illinois, Massachusetts, Ohio, Rhode Island, New Jersey and New York. Illinois is leading the nation with more than 700[5] communities setting up Municipal Aggregation programs. At the date of this report, there is pending legislation advocating for Community Choice in several other states.

Each of the existing Community Choice programs in other states offers operational and other insights for California. Illinois CCAs have generally focused on decreasing rates with wide adoption by local governments, including the City of Chicago, suggesting that participation is highly influenced by rate setting. Programs in Massachusetts have spurred local generation, including new solar projects throughout the state.[6]

While CCA in California has embraced a distinct goal to increase renewable power generation and use, the goals of some of other programs are instead focused primarily on decreasing rates.[7] However, despite the different goals, the successful operation of programs in other states further demonstrates the feasibility of CCA.

[5] Information excerpted from Plug In Illinois: www.pluginillinois.org/MunicipalAggregationList.aspx

[6] For a brief summary of Community Choice programs by State, see The National Conference of State Legislatures http://www.ncsl.org/research/energy/community-choice-aggregation.aspx and LEAN Energy US http://www.leanenergyus.org/cca-by-state/

[7] Some Community Choice programs in other states have advanced significant renewable energy projects.

CCA Design

As with all CCA in California, a Solana Beach CCA would procure electricity and implement customer energy programs, while SDG&E would continue to deliver power, send customer bills, and maintain the local electric infrastructure. The CCA would have wide latitude to select the energy sources it chooses, as well as the ability to establish programs and services that benefit the City. The choice of electric energy resources and additional programs and services will impact the customer electricity rates and the City revenues from the CCA.

Scenarios Considered

Working with elected officials and staff members of the City of Solana Beach, California Clean Power developed four scenarios for this analysis. The City used the level of renewable energy supply (Renewable Portfolio Standard, or RPS) as the driving variable to define these scenarios. Building new local renewables, behind-meter renewables, or implementing energy efficiency measures, which involve financing and development, are areas the City of Solana Beach should explore as part of its CCA. However, these are considered avoided power rather than RPS. In some cases, these measures provide lower-cost energy, greater greenhouse gas reductions per dollar, and more local benefits than RECs or renewable power purchased from the grid.

The City of Solana Beach has shown leadership regarding renewable energy. The City has an official goal of using 100% renewable resources for its energy needs. The City has also expressed interest in using CCA as a primary opportunity for achieving that goal, so long as its CCA can provide customers with competitive rates and can exceed renewable energy levels provided by SDG&E. The report provides various scenarios that could ultimately lead to that goal.

The first scenario presents a baseline level of 33% RPS, which is slightly higher than the current mandated renewable level, but that tracks State regulatory compliance over the next several years. The other three portfolio scenarios contain significantly higher RPS levels, which reflect the City of Solana Beach's record of serving as an environmental leader. All scenarios are outlined below.

Supply Scenario	Description	Renewables in Portfolio
Scenario 1	Baseline	Compliance (33% to 2020, 35% in 2021)
Scenario 2	Competitive rate, high renewable	Ambitious (50% in all years)
Scenario 3	High renewable	Aggressive (75% in all years)
Scenario 4	Maximum renewable	Maximize (100% in all years)

Scenario 1 (S1): Baseline. This scenario includes 33% renewables energy through 2020, increasing to 35% in 2021, in accordance with the California RPS requirements. This mirrors SDG&E's current renewable portfolio. This scenario serves as a contextual baseline, allowing Solana Beach to compare costs to existing SDG&E rates, as well as benchmark the cost and value of increased renewable procurement in different scenarios.

Scenario 2 (S2): Competitive Rate, High Renewable. This scenario assumes a level of renewable energy (50%) that is a significant increase above that currently delivered by SDG&E.

Scenario 3 (S3): High Renewable. This scenario is an aggressive move toward renewable energy (75%), placing Solana Beach ahead of virtually every jurisdiction in California and the country for renewable energy consumption.

Scenario 4 (S4): Maximum Renewable. This scenario maximizes renewable energy (100%). If launching or achieving this level soon after launch, the City of Solana Beach CCA would be the first 100% renewable CCA in California.

Customer Programs

CCA provides the opportunity to design and implement energy programs that are beneficial to its customers. While this report includes several scenarios with a different emphasis on the various benefits of CCA, the City could choose to add programs that focus on energy efficiency, self-generation, electric vehicles (EVs), resource development, and more. For example, in addition to standard rates for energy and base renewable content, the City could establish an optional 100% renewable energy service level, a Net Energy Metering program, a Feed in Tariff, a Community Renewable Shares program, and a Financed Efficiency program.

A 100% renewable energy option would allow individual customers to voluntarily increase the level of renewable energy the CCA purchases on their behalf. While participation in this will likely represent a small portion of the overall customer base, it is an important offering to help individuals exercise the fundamental benefits of CCA; control, and environmental impact.

While simpler to understand, an RPS "paradigm" does not include the unique utility bill savings and local economic and environmental benefits that come from installing local energy efficiency and behind-the-meter local renewables on the homes, businesses and the City's government properties. This approach not only "adds" green power delivered through the grid, but also "subtracts" demand from the bottom up at the meter. This subtraction also reduces aggregate peak load requirements, lowering the cost of electricity

for the City's CCA, and eliminating more carbon emissions than renewable power purchased from the grid.

At Solana Beach's direction, retained revenue and outside sources could finance local renewable resources and efficiency measures behind-the-meter at the point of demand, which energy or capacity would not be assessed for distribution, transmission and other charges, meaning substantial additional utility bill savings for participating customers.

Local renewables and efficiency products are sold through several different mechanisms:

- Net Energy Metering (NEM) allows individuals to receive a financial credit for electric energy generated by their own system (e.g. rooftop solar) and exported back to the utility or CCA. The credit is used to offset the customer's electricity bill. As noted by the California Public Utilities Commission (CPUC), "NEM is an important element of the policy framework supporting direct customer investment in grid-tied distributed renewable energy generation, including customer-sited solar PV systems."

- Feed-In Tariff (FIT) programs allow local energy generators to export renewable energy to the utility or CCA. The energy generation for FIT programs comes from projects larger than residential rooftop solar projects.

- Community Renewable Shares (CRS) programs allow individual customers to receive a financial credit for electric energy generated by local renewable systems based on the purchase of ownership of shares in the systems. This approach enables renters and owners at inappropriate sites for distributed generation to support and participate in, and benefit financially from, local renewable energy development. CRS facilities may be sited on buildings with demand patterns that coincide with the

generation pattern of the facility, and may be designed to enable sharing using electric vehicles and microgrids.

- A Targeted Efficiency program allows individual customers to receive financed energy efficiency products, measures and retrofits that are adapted to their credit rating, ownership status, and pattern of usage. Measures are repaid through a voluntary rate subscription. Thus, a slightly higher rate results in lower utility bills for the customer including, avoided surcharges.

In order to ensure smooth operations and program roll-out, the City should consider a phased approach to implementing these programs. For example, the CCA could launch with a 100% renewable optional level of service while waiting to accumulate sufficient reserves for additional programs. Similarly, the City of Solana Beach can develop programs that tie into or support regional programs over time, such a rate structure or other incentives that further SANDAG's electric vehicle initiative.

Collectively, these programs provide a significant incentive for new energy and economic development through the CCA, leading to growing distributed generation and local energy resilience. Once the City decides to move forward with implementing CCA, careful consideration should be paid to planning for development of these programs in advance so that market and other opportunities can be pro-actively leveraged.

Costs Components in the CCA

Each jurisdiction should create its own program, shaped to meet community priorities and climate goals. Because of this, exact overhead costs, including those costs that scale on a per unit basis, are not available with complete certainty. However, costs can be separated into those associated with program development, program launch, and ongoing operational and electric energy costs.

Program development costs generally consist of staff and consultant time to conduct feasibility analyses, market assessments, data requests, community outreach, as well as other activities. Based on other jurisdictions, these efforts can reach into the hundreds of thousand dollars.

For program launch, there are noticing and other legal requirements mandated by the regulations governing CCAs. Additionally the CPUC requires posting of a $100,000 bond, and the California Independent System Operator (CAISO) requires a $500,000 bond for any entity registering as a market participant to schedule energy load. To initiate energy purchases, an additional several million dollars can also be required depending on the size of the jurisdiction and how initial energy procurement is approached.

Based on the experience of operational CCAs, we estimate an expense at approximately $1.8 - $2 million per year to develop and launch a CCA for the City of Solana Beach. It is important to note that this does not include the expense of credit or capital needed to initiate energy procurement, which could potentially be close to $1 million, depending on how the program is launched.

For ongoing costs, in addition to the direct cost of energy, CCA customers will incur several other major categories of costs, including overhead costs, a “departing load” charge (PCIA), and transmission and distribution costs.

There are a number of different ways that the CCA can fund overhead costs. These options include leveraging taxpayer dollars or taking on debt to form a single-jurisdictional program or a Joint Powers Authority. This also includes forming a public-private partnership with “all-in” or “turn-key” services provider for a single flat, $/MWh fee.

The IOU assesses the Power Charge Indifference Adjustment (PCIA), or "departing load" charge to CCA customers. The PCIA is a per Kilowatt hour (KWh) charge designed to compensate the utility for costs that were incurred on the CCA customers' behalf prior to leaving the utility service. This charge is highly contentious and is subject to ongoing rate-making proceedings. The CPUC has scheduled workshops on this topic in response to vocal opposition to the PCIA.

Finally, all customers are required to pay non-generation charges (transmission, distribution, and other categories) regardless of CCA participation. These volumetric charges vary somewhat by customer class, but historically have comprised between 45% and 60% of the total bundled rate.

As indicated above, volumetric or per KWh charges are a significant percentage of the total CCA bill, and may be significantly reduced through behind-the-meter measures such as distributed renewable generation and energy efficiency measures. When organizing and developing its CCA, the City should consider options for incorporating energy from behind-the-meter renewables and strategies for energy efficiency technologies that are exempt from these charges.

The amount of savings from going behind-the-meter can be substantial. While the ratio of SDG&E electric bill charges varies by customer, SDG&E's posted sample electric bill is illustrative; an electric bill with an Electricity Generation charge of $148.46 has more than *twice* that amount - $321.05 - in associated volumetric charges that are avoidable through behind-the-meter measures.[8]

[8] Electricity Generation $148.46; DWR Bond Charge $9.88; Transmission $34.55; Distribution $150.88; Public Purpose Programs $119.30; Nuclear decommissioning $.85; Competition Transition Charge $5.92. See SDG&E, "Understanding your SDG&E Bill," p.2. https://www.sdge.com/sites/default/files/documents/1651401700/samplebill_res.pdf?nid=1588

Load & Resource Analysis

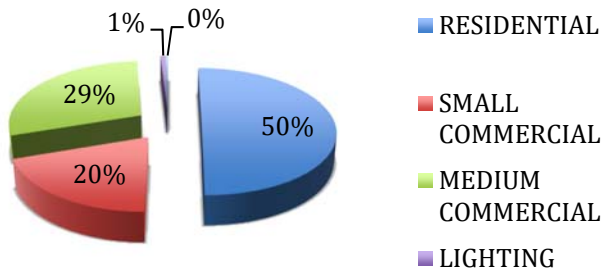
Solana Beach has approximately 7,800 electric customers projected for 2016. While most customers are residential, approximately half of energy used is by commercial customers (small and medium commercial combined). The City, which has a peak load of less than 20 MW, represents a small portion of SDG&E's overall load. Without any large commercial or industrial accounts, the City's customer make-up is more weighted to Residential and Small Commercial customers.

2014-2016 Customer Accounts and Annual Energy Consumption

CUSTOMER	ACCOUNTS				LOAD (MWh)		
	2014	2015	2016		2014	2015	2016
Residential	6,850	6,900	6,920		39,271	39,800	40,300
Small Commercial	759	770	770		15,374	15,600	15,800
Medium Commercial	91	90	95		22,913	23,200	23,500
Lighting	10	10	10		600	600	610
Agricultural	3	5	5		140	140	140
Total	7,713	7,775	7,800		78,299	79,350	80,350

SDG&E Residential load is 37.4% of the system total, while Solana Beach's Residential load is 47.8% of the system total. Correspondingly, SDG&E Small Commercial load is 10.3% of the system total, while Solana Beach's Small Commercial load is 23.7% of the system total. CCP has included an annual increase in load of 1.3% across customer classes based on California Energy Commission (CEC) projections and local variables.

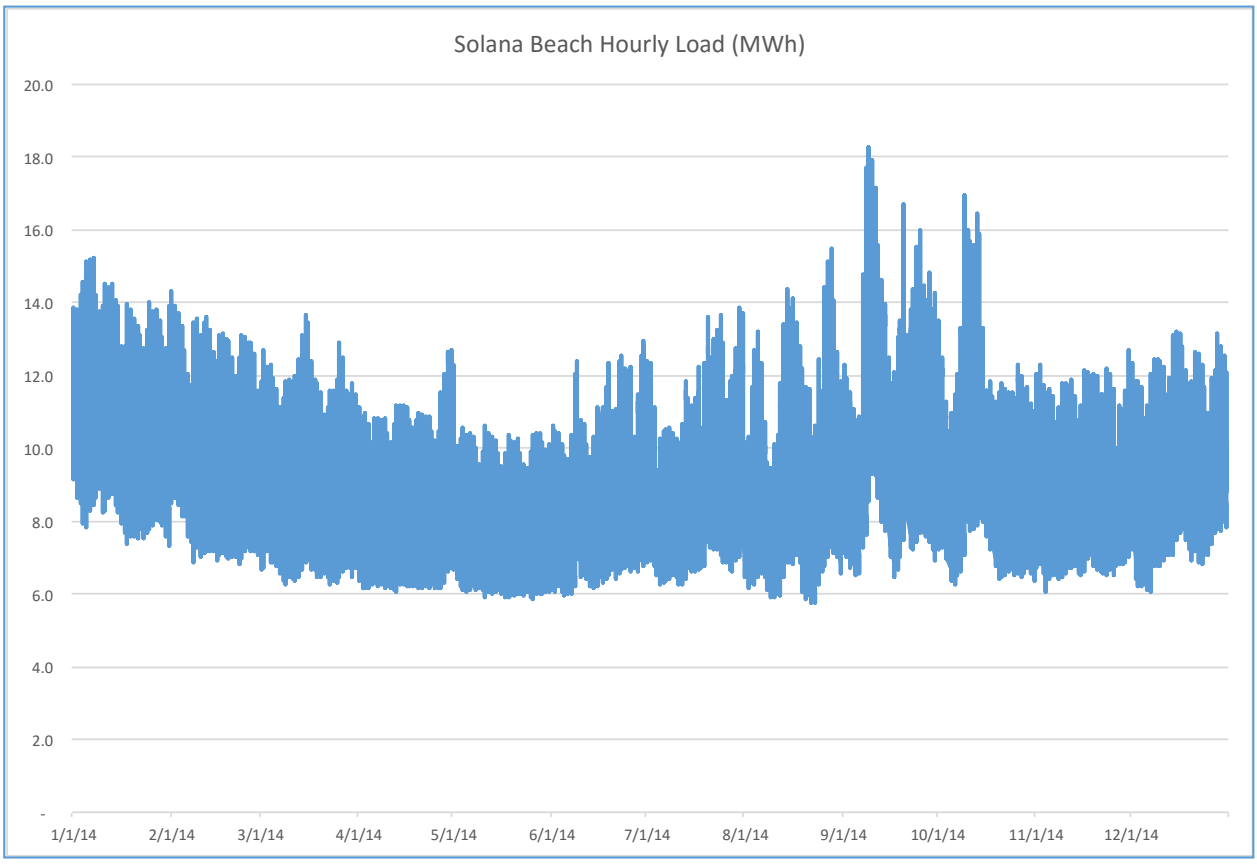
2016 Solana Beach Energy Use, Customer Class



Solana Beach's Medium Commercial load is similar to SDG&E (28.2% for the City, 30.2% for SDG&E), and neither the

City of Solana Beach or SDG&E has a material amount of agricultural load (less than 1.5%). It is worth noting that while SDG&E and Solana Beach Medium Commercial customers make up a similar percentage of the overall load, SDG&E Medium Commercial customers consume about 30% more energy per customer than the City's Medium Commercial customers (259.1 kWh/year vs. 178.7 kWh/year).

While hourly load data is not available for the City of Solana Beach, SDG&E provides system-wide hourly consumption data, by customer class, as well as customer counts for each customer class. Scaling the Solana Beach consumption information to the SDG&E system-wide load shows that Solana Beach represents approximately 0.4% of the SDG&E system, and approximately 18 MW of peak load.



While using SDG&E hourly system load data is appropriate for assessing the feasibility of a Solana Beach CCA, it should be noted that using SDG&E system data for purposes of creating accurate hourly load information for Solana Beach is imperfect. SDG&E consumption patterns in the data include both coastal and inland customers. Solana Beach will have a slightly different consumption pattern due to its geographic location on the coast.

The monthly energy consumption for Solana Beach is consistent with California south coast energy consumption, which has a significantly "flatter" profile than the typical SDG&E load profile. This is attributable to the temperate coastal weather and resulting decreased air conditioning use. As shown in the table on the following page, while Solana Beach Small Commercial, Medium Commercial, and Agriculture customers maximize consumption in the month of September (as does the rest of the SDG&E load), Solana Beach residential customers peak consumption is in January.

Monthly Energy Consumption by Customer Class, 2014 (kWh)

	2014											
Kwh	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Agriculture	17,566	15,476	16,621	15,894	16,979	17,747	19,530	18,355	19,940	17,740	15,843	17,117
Commercial/Industrial - Medium	1,895,887	1,702,453	1,830,822	1,745,370	1,768,319	1,924,939	2,056,353	2,014,887	2,298,261	2,147,925	1,900,052	1,939,877
Commercial/Industrial - Small	1,584,932	1,413,673	1,492,239	1,381,590	1,400,214	1,532,020	1,669,418	1,704,541	1,903,155	1,746,822	1,510,217	1,555,285
Outdoor Lighting Residential	529	529	529	529	529	529	529	529	529	529	529	529
Outdoor Lighting Small Commercial	49,661	49,661	49,480	49,516	49,500	49,478	49,478	49,478	49,478	49,478	49,478	49,478
Residential	4,278,962	3,344,970	3,406,899	2,955,194	2,778,667	2,921,483	3,203,619	3,233,286	3,572,404	3,345,997	2,907,058	3,374,403
Grand Total	**7,827,537**	**6,526,762**	**6,796,590**	**6,148,093**	**6,014,208**	**6,446,196**	**6,998,927**	**7,021,076**	**7,843,767**	**7,308,491**	**6,383,177**	**6,936,689**

Resource Adequacy (RA) capacity is required for all Load Serving Entities (LSE) to demonstrate there will be sufficient generating resources available in the market to meet energy demand during system peak periods. RA may be reduced through load reforms that replace September commercial/industrial peak grid demand with behind-the-meter resources like solar photovoltaics and energy efficiency measures; January peak grid demand with energy efficiency measures or EV batteries, or aggregate peak conditions with matching resources that shape the load to lower the cost of all energy sold through the CCA. RA Requirements are discussed further below.

Resource Analysis and Current Electricity Market Conditions

As with all CCAs, a Solana Beach CCA would be fully integrated into the California Independent System Operator (CAISO) electric grid and part of the California and western U.S. wholesale power market. The wholesale energy market is very robust, with a multitude of sellers, buyers, brokers and consumers.

The "market" is actually an aggregation of many markets, including bilateral, broker and exchange-traded markets, and the CAISO day-ahead, hour-ahead and real-time bid markets. In addition to energy, these markets offer a range of products that are required by Load Serving Entities (LSEs), such as CCAs, to serve their load, such as RA. The table below provides a sample of these markets.

Energy Market Transaction Types						
Market	**Product**	**Typical Size**	**Liquidity**	**Price Transparency**	**Cost**	**Typical Use**
Bid Solicitation	Energy, RA, Renewable	Any	Low	Low	High	Acquire specific long-term resource
Bilateral	Typically 1-yr. plus	Any	Medium	Low	High	Long-term procurement mechanism
Electronic Exchanges (i.e. ICE)	Standard	25+ MW	High	High	Low	Seasonal, monthly
CAISO	DA, HA, RT RA Products	Any	High	High	Low	Load balancing
REC Brokers	RECs	Any	Medium	Medium	Med	RPS requirements

As a whole, California has more than enough resources to meet electric demand, including reserves, at all times of the year. This is largely due to the California RPS requirements, which has resulted in a substantial amount of new generating capacity being added to the system while energy loads have stagnated. This over-supply situation is anticipated to continue for the foreseeable future, despite the shut-down of several large power plants such as the San Onofre Nuclear Generating Station (SONGS).

To illustrate this, the CAISO, which is responsible for ensuring reliability of the grid, requires LSEs to maintain a capacity reserve margin of 115% of projected load requirements. For 2015, the system reserve was almost 140% of projected load, shown in the table below.

Planning Reserve Margins

Summer 2015 Supply & Demand Outlook (Planning Reserve Margins)			
Resource Adequacy Planning Conventions	**ISO**	**SP26**	**NP26**
Existing Generation	54,044	26,660	27,384
Retirement	0	0	0
High Probability Addition	278	117	161
Net Interchange (Moderate)	9,500	8,700	2,000
Total Net Supply (MW)	63,822	35,477	29,545
DR & Interruptible Programs	1,840	1,297	543
Demand (1-in-2 Summer Temperature)	47,188	27,183	20,832
Planning Reserve Margin	**39.1%**	**35.3%**	**44.4%**

Energy prices are very volatile in the short-term markets (i.e. hourly, daily) due to swings in energy demand and resource availability, but are much more stable in the longer-term markets. Prices in the California (and national)

energy markets have been extremely low in recent years, largely driven by the fact that the primary energy fuel for California is natural gas, which have also been low. Because of this, the cost of natural gas is an important measure, since there is a strong correlation between natural gas and electric energy prices. The chart below depicts this correlation, showing the movement of both natural gas and spot electricity prices between April 2013 and 2015.

Southern California Electricity and Natural Gas Prices, 2013-2015

Source: Bloomberg

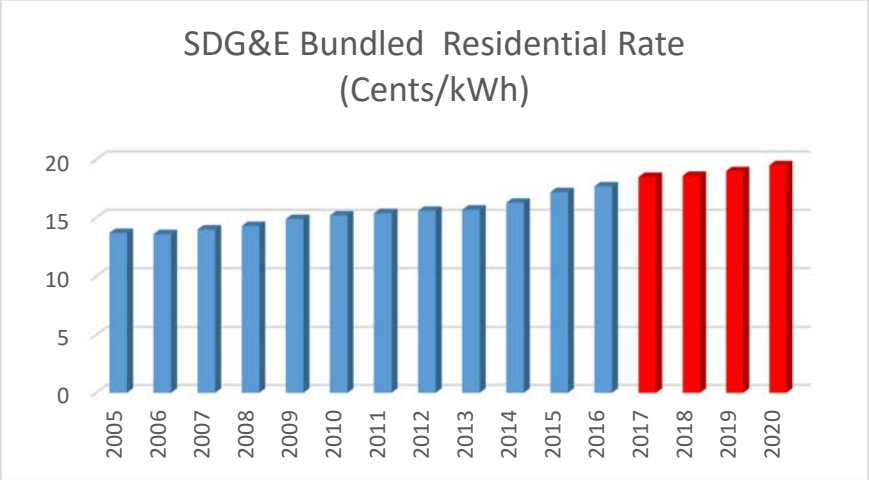
While it is speculative, gas prices are expected to stay low for the foreseeable future. With the rise and proliferation of shale fracturing (or "fracking") in the United States, natural gas supplies have increased significantly, putting significant downward pressure on prices, and therefore materially reducing wholesale electricity prices.

Another major driver of the energy prices in California is the substantial development of renewables. California has over 10,000 MW of solar facilities, both utility-scale and rooftop. As a "peak reducing" resource, solar output mirrors mid-day customer demand. This phenomenon has served to break the correlation between temperature, load, and price. Wholesale spot market prices are no longer highest in the middle of the day when air

conditioning load is peaking, but rather are higher during the evening hours, when the sun is not directly shining on solar panels but air conditioning is still in use.

SDG&E Rates

SDG&E bundled rates to customer have been increasing at approximately 2.3% annually over the past decade, and are expected to continue increasing over the forecast period according to the utility in their bi-annual procurement plan, even in the face of declining gas and power prices. Based on these historical increases and other market factors, our projections assumed a continual increase of 2.5% during our projection years.



Energy Portfolio Procurement

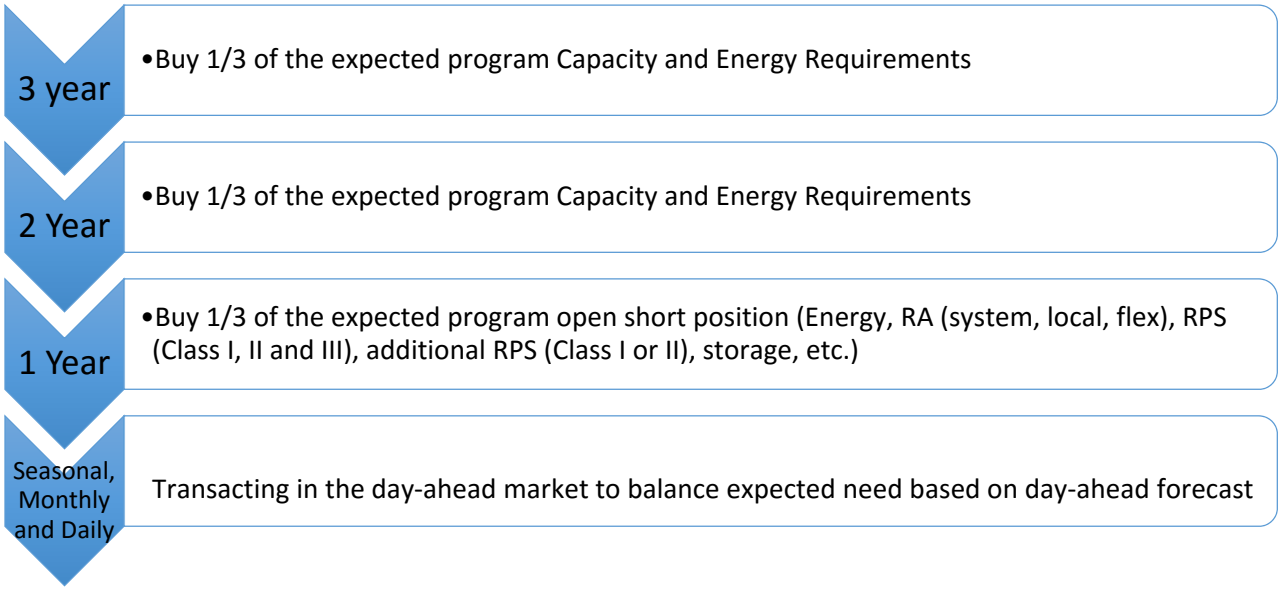
Every CCA is responsible for procuring energy and capacity to meet the projected energy needs of its customers at all times. Procurement can be thought of as a process that starts with the launch of the CCA, and ends with the CCA owning or controlling (via Power Purchase Agreement, or PPA) all of the necessary resources to serve their load on an hourly basis. A CCA needs to develop a portfolio of products and resource that will allow it to meet the requirements at lowest cost and lowest risk. Wholesale procurement activities for

CCA fall into three primary major categories: System Power, Resource Adequacy, and Renewable Portfolio Standard. Specific products that the CCA would be required to procure are listed below.

CCA Energy Products Required	
Product	**Description**
Energy	SP15 or SDG&E DLAP Forward Contracts
Resource Adequacy Capacity	Will need to procure system, local, and flexible RA capacity
Renewable Energy	CA Class I, II and III
Storage	As required
Ancillary Services	Self-provide or Procured through CAISO

The City's CCA should ideally develop a tiered portfolio of resources, designed to ensure that all requirements are met at low cost without exposing Solana Beach customers to the price volatility of the near-term markets. This tiered portfolio would include transactions that occur in long-, near and short-term, and are procured at different times. The graphic below provides a high level summary of this strategy.

Illustrative Tiered Portfolio



This approach will not lock the CCA into long-term contracts that might interfere with over-arching CCA goals of energy asset ownership/control. However, these purchases will allow the CCA to lock-in fully the first year of expected commodity, which will facilitate rate setting and take advantage of prevailing low market prices. The CCA will also lock-in a portion of later year energy needs, but not everything. If market prices fall, the CCA is still short and will be able to buy at even lower pricing. If prices rise, the CCA has some hedges in place to mitigate the impact of rising prices on its portfolio. In addition, fixed price renewable contracts help provide some cost certainty for a CCA, and is advisable as a hedging strategy against market price fluctuations and regulatory risk from future CPUC-authorized charges.

Based on resource planning, the CCA will also integrate, anticipate and structure procurement activities to plan for reduced demand from energy efficiency programs or behind-the-meter generation (i.e. rooftop solar or other onsite generation), ownership of utility-scale wind, solar, geothermal or other projects – local, renewable, owned & controlled by the CCA, and off-take (i.e. PPA) from utility-scale renewable projects.

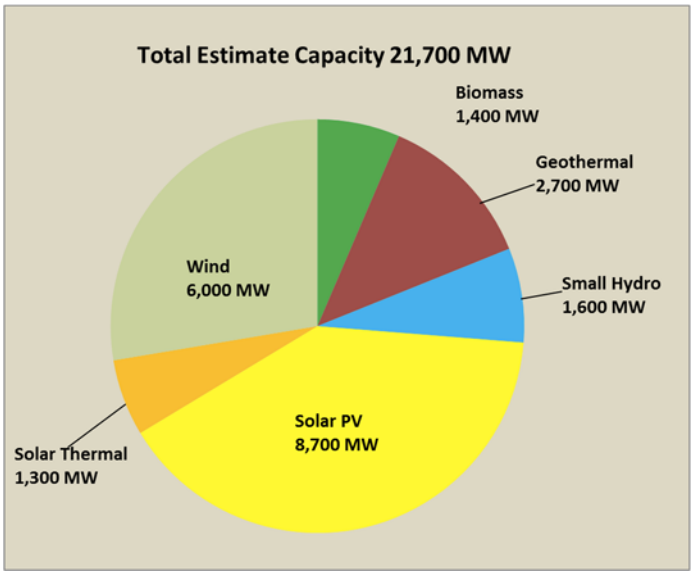
The CCA will never be out of the bi-lateral market entirely. With approximately 80,000 MWh/year of expected load, were Solana Beach to own 80,000 MWh of generation, there would still be large mismatches between generation and consumption. Those mismatches will need to be balanced on a monthly, weekly, daily, and hourly basis when favorable market conditions exist.

Renewable Energy and RECs

Established in 2002 under Senate Bill 1078, accelerated in 2006 under Senate Bill 107, expanded in 2011 under Senate Bill 2 and again under SB 350 in 2015, California's Renewables Portfolio Standard is one of the most ambitious renewable energy standards in the country. The RPS program requires IOUs, electric service providers, and CCAs to

procure energy from eligible renewable energy resources (or procure Renewable Energy Credits, or "REC", explained in the Renewable Energy Credit section) to meet the RPS. For 2016, the RPS requirement is 25%, increasing to 33% by 2020 and 50% by 2030.[9]

Renewable Resources



California has over 21,000 MW of installed renewable generating resources including solar thermal, solar photovoltaic (PV), wind, geothermal, biomass and small hydro resources that are used to meet its renewable requirements. In addition to this there are approximately 10,000 MW of renewables currently under development seeking interconnection to the CAISO grid. In San Diego County there are over 150 MW of renewables seeking to interconnect to the transmission and distribution grid. Most of the renewables under development use solar PV technology. Wind, geothermal and biomass resources are typically location-specific, while solar can be located almost anywhere, with minimal environmental and siting concerns.

While there are no strict categories of renewables, there are generally three different groupings of renewables based on the interconnection of these resources to the electricity grid:

9 For more information, the California Energy Commission's RPS Guidebook is available at: http://www.energy.ca.gov/2013publications/CEC-300-2013-005/CEC-300-2013-005-ED7-CMF-REV.pdf

- Grid Renewables. These are typically resources greater than 20 MW in capacity that are directly interconnected to the CAISO grid at a voltage greater than 69 kV, and the interconnection process is managed by the CAISO. These are typically the cheapest to develop due to their economy of scale, but have the greatest exposure to regulatory risk of increased transmission charges, and cost fluctuation.

- Distributed Renewables. These resources are generally less than 20 MW and are connected to a utility's distribution system at a voltage of 69 kV or less. The interconnection is managed by the local utility. Most of the projects are generally between 2-5 MW, and tend to be higher in cost than grid renewables since they generally cannot achieve the economy of scale that larger facilities can, but offer benefits such as improved local energy resilience, local jobs and economic development, and lower transmission charges and regulatory risk.

- Self-generation. Self-generation, or "behind the meter" renewables, are resources located at the owner's facilities and all energy output is used by the customer on non-exporting systems, or else is designed for export under a NEM or FIT program. While most of these resources tend to be small roof-top PV systems, there are a number of multi-megawatt wind and solar systems serving facilities such as manufacturing and office campuses, as with most Community Renewable Shares programs. These are higher cost resources in conventional markets where there is a high cost of marketing, acquiring customers and site surveys, as they are typically custom-designed to fit a location, and often need to be designed or operated to meet specific facility requirements. However, these costs may be substantially reduced through the CCA program's access to customer data, direct monthly communication with customers, and opt-out enrollment structure to bring them into cost range of utility-scale renewables.

Renewable Energy Market

The renewable energy market in California is fairly robust and highly competitive. As such, CCAs have a range of opportunities to procure renewable energy and/or RECs. In the San Diego area, there is a substantial amount of existing and proposed solar PV resources. While solar is the dominant renewable in the region, there is potential for wind, particularly in Baja, Mexico. The Salton Sea area has a substantial amount of geothermal potential, and some new plants are under development in the area, but it remains an underutilized and expensive resource. The specific technologies that could be contracted will depend on when the CCA initiates its procurement.

Based on Solana Beach's direction on renewable portfolio planning and retained revenue investment, cost modeling should be undertaken to plan the incorporation of local and regional resources, including grid-connected, distributed, behind-the-meter, and energy efficiency technologies. Modeling would include estimates of the timelines and sites for large projects, and customer classes/attributes for smaller behind-the-meter installations or retrofits for each month through the next decade.

Most merchant PV projects are developed only if there is a long-term contract (15 year or longer) for the facility's power output. This is primarily due to the importance of financing projects through such agreements versus using balance-sheet financing (i.e. paying cash). Because of this, there is a limited bilateral market for renewables.

Meanwhile, there are several other opportunities in the current market where the CCA could procure low-cost, short-term renewable capacity and energy that would allow the CCA to build program revenues and operating history to finance CCA-owned local renewables, such that the CCA could more easily participate in longer-term contracting for renewables during the interim. During this "bridge" period, power could come from large and small facilities under a variety of scenarios:

- Commercial financing. The City of Solana Beach could seek financing for behind-the-meter renewables and energy efficiency, and administer targeted product offers to customers through the CCA program. By including this financing as part of the program launch, the CCA could immediately enroll customers in financed energy efficiency, behind-meter products and Community Renewable Share products rather than wait for revenue accumulation over several years of operation.

- Excess capacity from existing facilities. Many renewable developers "overbuild" their facility's capacity to ensure there is sufficient capacity available to meet its sales obligations. (i.e. the developer installs 110 MW of capacity to ensure it can always deliver 100 MW of contracted "firm capacity" to a customer.) This excess capacity may be available for sale to other customers on a short-term basis.

- Capacity from facilities on-line prior to contract start. There are a number of PV projects currently under development and construction that do not have contracts for full output or the contract start–date is several years in the future. This anomalous situation is due to a recent change in federal tax policy. The federal Investment Tax Credit (ITC) for solar, which provides a 30% tax grant for new solar facilities, was set to decrease to 10% at the end of 2016. Expecting this decline, in 2015 California utilities contracted for solar resources with contract start dates in 2019 or later. The contract allowed the developers to build the facilities by 2016 to get the full 30% ITC, with the intent that the developer would sell the power in the spot or short-term market until the contract term begin. The result of this is there is potentially several hundred MW of solar capacity available in the 2017-2021 time horizon.

- Add-on capacity at existing PV facilities. Solar PV is largely a modular technology, and facilities can generally be expanded as long as there is sufficient infrastructure to support it. Oftentimes a solar facility has the physical space and infrastructure to

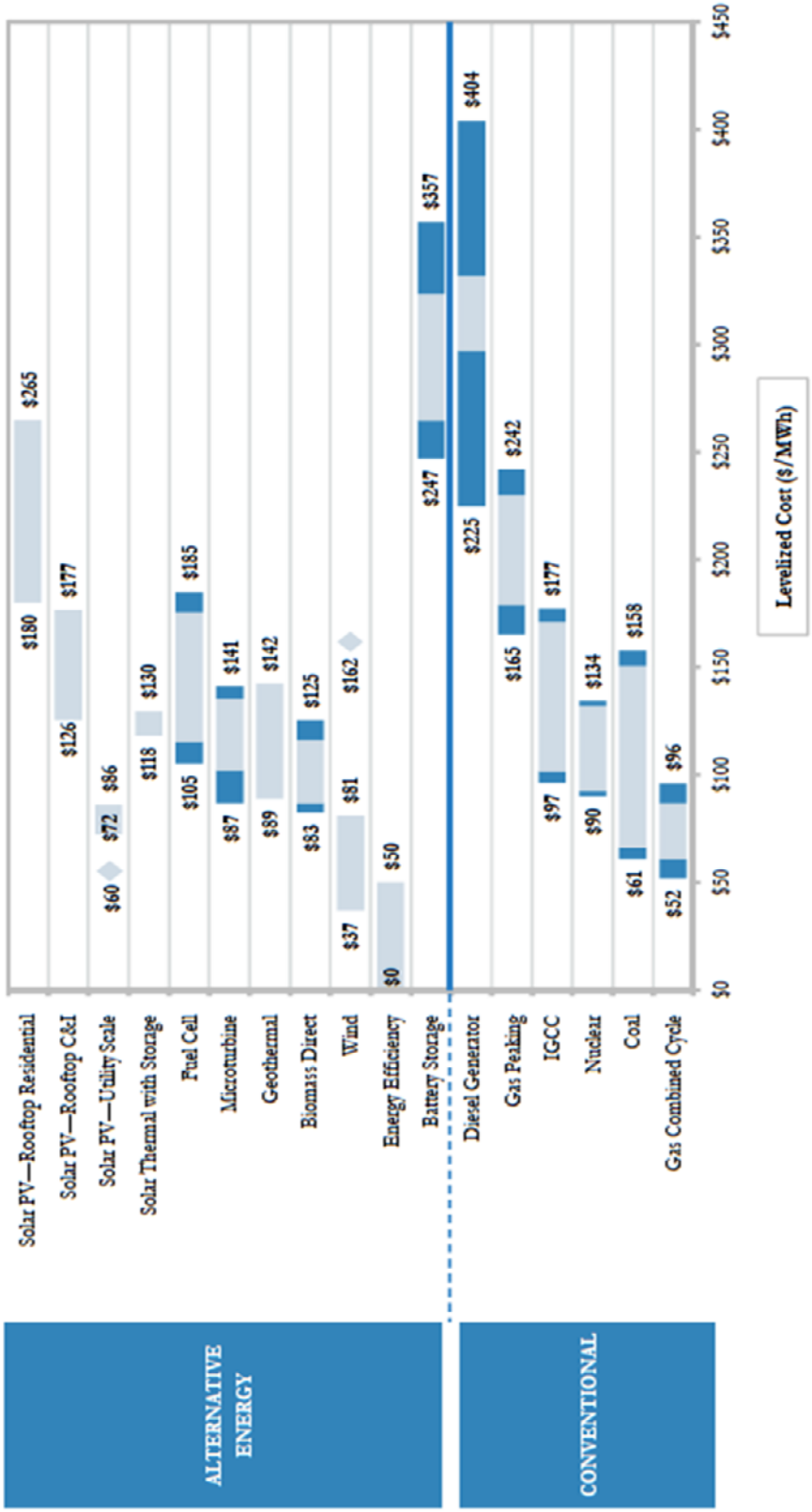
support a small amount of additional capacity once the larger facility has been developed. The marginal cost for this is typically low, and facility owners are very interested to maximize the value of the facility.

Renewable Resource Costs

The cost of energy for renewables has become competitive with conventional generating resource costs in many instances, though the cost varies widely depending on the technology, size and location. The table on the following page, prepared by Lazard in 2014, depicts a comparison of the relative costs of the different generating technologies.

Levelized Cost of Energy for Generation Technologies ($/MWh)

Source: Lazard, 2014



As previously noted, it is important to note that some distributed renewables like solar photovoltaics often are more expensive in conventional (non-CCA) markets because of "soft" transaction costs that are avoidable using CCA's opt-out enrollment, access to customer data, and ability to access customer bill statements.

The National Renewable Energy Laboratory (NREL) reports that, whereas the hardware costs between residential/commercial/industry and utility scale costs are virtually the same, residential soft costs excluding labor account for residential systems are 44%, commercial 33%, and utility scale 23%. While installation labor is virtually the same (9-11%), hardware costs include a significant range from residential 45%, commercial/industrial 58% and utility scale 66%.[10]

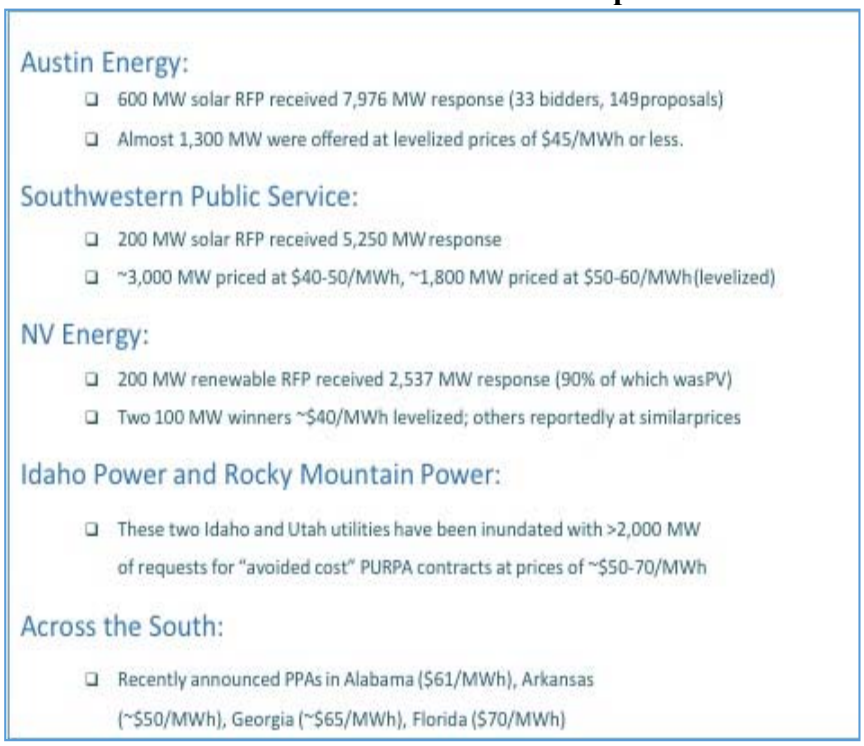
These differences can be mitigated with an effective use of CCA data to tailor products and target customers to minimize soft costs. Specifically, rather than using "blind" marketing programs to offer incentives to customers and developers, the Solana Beach CCA can analyze customer usage data that is unavailable to market participants other than SDG&E, to determine which technologies would perform optimally to reduce costs for consumers and the community, based upon each customer's daily and seasonal usage patterns, aggregate CCA-wide demand patterns, and wholesale market conditions.

Competition in the utility scale renewable market in California is intense. California utilities do not routinely publish information on amounts of capacity offered or contracted as a result of RFPs, but information compiled by Lawrence Berkeley National Laboratory

[10] (U.S. Photovoltaic Prices and Cost Breakdowns: Q1 2015, Benchmarks for Residential, Commercial, and Utility-Scale Systems - National Renewable Energy Laboratory, Technical Report NREL/TP-6A20-64746 September 2015, v.). http://www.nrel.gov/docs/fy15osti/64746.pdf

(LBNL) on recent RFPs in other states is indicative of the competition in California.[11] The figure below presents the finding in the LBNL report. In addition to the LBNL information, anecdotal data suggest the prices are continuing to fall. A recent contract for the Palo Alto municipal utility to purchase power from a solar PV system at a price of $36.76/MWh, or about 3.7 cents/kWh further highlights this point.

Recent Renewable RFPs and Responses



Source: Lawrence Berkeley National Laboratory, 2015

[11] Utility-Scale Solar 2014; An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States; Lawrence Berkeley National Laboratory, https://emp.lbl.gov/sites/all/files/lbnl-1000917%20presentation.pdf.

Renewable Energy Credits

Renewable Energy Credits, or RECs, represent the renewable-only attribute of the renewable resource but does not include the energy generated. The energy is usually sold in the wholesale market and sometimes called "brown" power. A REC represents 1 megawattt-hour (MWh) of energy. All RECs are not created equal; there are several different types of RECs, and the LSE needs to understand what type of REC they are generating or buying and if it is eligible for compliance with the RPS regulations.

- Category 1 RECs are referred to as bundled RECs because they include both the energy and the environmental attributes associated with the energy produced by the facility. Additionally, the energy must be contracted for prior to delivery and be delivered to California without substitution by another resource. Beginning in 2017, at least 75% of RPS procurement used for compliance by an LSE must be Category 1.

- Category 2 RECs are often referred to as firmed and shaped renewable energy. In this case, the LSE signs a contract for delivery with an eligible facility that is not directly connected to a California Balancing Authority (CBA) and may at times require substitution from another resource. The energy used for substitution must be incremental to the LSEs existing portfolio. Category 2 has no minimum requirement but is capped at the residual of the compliance requirement and the minimum amount of Category 1.

- Category 3 RECs are referred to as unbundled RECs. A contract for Category 3 RECs does not include the energy or if it does include the energy may not be eligible for Category 1 or 2. An example would be certain distributed generation resources that produce RECs but are ineligible for Category 1 status. Beginning in 2017, Category 3 is capped at 10% of retail sales.

In California there is a nascent market for RECs, mostly among small LSEs that may not have renewable generation themselves, and for utilities to "true-up" their RPS annually. RECs are also used by large companies to voluntarily offset their fossil fuel energy consumption. REC values are difficult to ascertain since this is generally a brokered market with no requirement for parties to disclose prices. Finally, REC prices will differ based on transaction size, duration and REC type.

Storage

Pursuant to AB 2514, CCAs are to procure storage equal to 1% of their 2020 annual peak load, with installation no later than 2024. Furthermore, starting January 1, 2016, and every two years thereafter, CCAs must file a Tier 2 Advice Letter with the California Public Utilities Commission demonstrating their efforts to comply with the target, including a discussion of the cost-effectiveness methodology used to evaluate projects. For the City of Solana Beach CCA, it is estimated that procuring or developing a 160 kW storage facility will fulfill this requirement.

While storage represents a compliance cost, it also represents an important new economic opportunity to reduce demand for market power during the early evening hours. These hours are when power market prices rise due to persistent air conditioning during hours of reduced solar photovoltaic generation, and also when Solana Beach residential customers' loads peak during January. There is a growing movement to view – and use – electric vehicles as dynamic chargers to reduce early evening peaking while also augmenting behind-the-meter renewables, that correctly links a CCA program's carbon reduction benefits to the local transportation sector.

Resource Adequacy

As a Load Serving Entity, the CCA must also comply with the CPUC Resource Adequacy program, which requires all LSEs to have sufficient generation resources in all hours to meet all of their customer demand plus a reserve margin in case of unit outage or system emergency. The objectives of the Resource Adequacy program are to ensure safe and reliable operation of the grid by the CAISO. There are three specific RA requirements that each LSE must meet.

- System RA. The LSE must secure sufficient System RA to cover 115% of its forecasted peak demand for each month.[12] With respect to this requirement, each LSE must make an annual filing on or before October 31st to show that it has obtained at least 90% of the System requirements for the summer months (May through September). Subsequently, the LSE must submit a filing for each month 45 days ahead of the start of the month, that demonstrates that it has met its obligation for that month.

- Local RA. The LSE must secure sufficient Local RA to ensure there is sufficient capacity in the local area. With respect to the Local RA requirement, the LSE must demonstrate it has met 100% of its requirement in the annual filing.

- Flexible RA. The LSE must secure sufficient Flexible RA that is based on the maximum 3-hour ramp analysis performed by the CAISO for each month. The CPUC determines each LSE's responsibility is based on the CAISO study. Similar to the System RA requirement, the LSE need only show 90% of their monthly requirement

12 The actual requirement may be less due to coincident peak adjustments, allocations for demand response, energy efficiency, distributed generation, cost allocation mechanism (CAM), and reliability must run contracts.

in the year ahead filing, but for all months, not just the summer months. The full requirement must be met in the 45 day ahead filing.[13]

Scheduling

All LSEs operating within the CAISO are required to schedule their loads and generation resources into the CAISO's wholesale energy market on a daily (and if necessary, hourly) basis, as well as providing bids for any energy and ancillary services that it seeks to buy or sell. Additionally, the CAISO requires that all LSEs become or hire a Scheduling Coordinator, an individual or entity that the CAISO can communicate with regarding system conditions on a real time (hourly) basis and, if necessary, specific needs for the LSE.

Larger LSEs, such as utilities and wholesale power marketers, typically perform their own required Day Ahead and Real Time scheduling, and are Scheduling Coordinators. Smaller entities, such as stand-alone generating facilities and CCAs, typically outsource this function to an entity that will serve as Scheduling Coordinator on their behalf. There are numerous firms that offer this service, generally charging a per-megawatt hour fee. Existing CCAs in California rely on firms to provide this service.

13 Information Excerpted from CAISO: www.caiso.com/Documents/Apr8_2015_Draft2016_FlexCapacityNeedsAssessment_R14-10-010.pdf

Scenario Analysis

This section provides an overview of the methodology used to conduct the scenario analysis and summary output of that analysis. The analysis is intended to address the question of whether CCA is feasible for the City of Solana Beach and to provide some information on the parameters of CCA. If the City moves forward in implementing CCA, it should conduct additional planning and analysis based on specific policy direction from the City Council and input from the community.

The analysis includes both a one-year and a 5-year horizon for each scenario. The one-year analysis is a 2016 snapshot to determine whether a CCA can be financially feasible, and the amount of "head room" or margin that exists between a CCA's costs and current SDG&E rates. The 5-year forecasts run from 2017 – 2021 because the likely launch of a Solana Beach CCA would be in 2017 rather than 2016.

Assumptions & Methodology

A multitude of detailed assumptions are required to properly estimate the costs and community benefits of the CCA program. Our assumptions are based on data received from SDG&E, market and economic trends, as well as our understanding of the City of Solana Beach's goals and objectives. Because the City is too small to support an operational infrastructure similar to the currently operating CCAs, operational costs have been assumed as a MWh service fee accounting for public-private partnership. As a conservative estimate, we have set this fee at $5.75/MWh, which equates to an approximate $370,000 annual operating cost.[14]

14 This total cost assumes an opt-out rate of 20%, removal of Direct Access customers, and includes some meter charges from SDG&E.

The table below provides a summary of the major assumptions used in our modeling. Upon the creation of an Implementation Plan and more complete program design, the City should conduct additional analysis of specific desired outcomes, procurement strategies, and implementation roll-out.

Scenario Analysis Assumptions	
Variable	**Assumption**
Analysis timeframe	1/1/2017-12/31/2021
Load Forecast	SDG&E 2014 base load for Solana Beach without Direct Access
Load Growth	1.3% annually based on California Energy Commission's 2016 projection
Load Shape	Monthly usage provided by SDG&E for Solana Beach
Customer Participation	80% of all customer classes
Resource Adequacy Requirement	115% of peak load
Resource Adequacy Price	Varies by month, ranging from $1.50 -$26.00, based on Bloomberg forward price index
SDG&E Rates & Fees	Tariff rates for all customer classes as of 1/1/2016
SDG&E Rate Escalation	2.5% per year, based on historical data and CPI
PCIA Rate	Tariff rate as of 1/1/2016
Market Energy Price Forecast	Monthly energy forward prices for SP-15 at 01/19/2016
CAISO Charges	Estimated grid management charge and ancillary service costs
Energy Conversion	Estimated CAISO scheduling, load shaping, basis differential, and line losses at premium of 20-25% of energy costs
Renewable Energy Price Forecast	Market energy cost plus $25/MWh premium
CCA Administrative	This cost covers the operational cost of the CCA, including energy management and contracting, customer service, financing and other overhead costs
Customer Rate Discount	Assumes a total bill discount to customers, starting at 3% across all classes
Uncollected Revenue	0.5% per year, based on operating CCAs

Scenarios

Based on input from the City, using the assumptions shown above, the report includes four scenarios. All of the above scenarios are based on the assumption that the CCA will launch fully at the scenario criteria (e.g. 50% RPS) rather than ramp up to that level, and remain at that level for the 5-year analysis period. This is done to analyze feasibility; the City may choose to implement the program in a different manor based on a variety of factors.

The City of Solana Beach has shown leadership regarding renewable energy. The City has an official goal of using 100% renewable resources for its energy needs. The City has also expressed interest in using CCA as a primary opportunity for achieving that goal, so long as its CCA can provide customers with competitive rates and can exceed renewable energy levels provided by SDG&E. The report provides various scenarios that could ultimately lead to that goal. The four scenarios are:

Scenario 1 (33%): Baseline. This scenario includes a 33% renewable component through 2020, increasing to 35% in 2021 (as required). This scenario serves as a contextual baseline, allowing Solana Beach to compare the costs to existing SDG&E costs and rates, as well as benchmark the cost and value of increased renewable procurement in different scenarios.

Scenario 2 (50%): Competitive Rate, High Renewable. This scenario assumes a level of renewable energy (50%) that is a significant increase above that currently delivered by SDG&E.

Scenario 3 (75%): High Renewable. This scenario is an aggressive move toward renewable energy (75%), placing Solana Beach ahead of virtually every jurisdiction in California and the Country for renewable energy consumption.

Scenario 4 (100%): Maximum Renewable. This scenario maximizes renewable energy (100%). If launching or achieving this level soon after launch, the City of Solana Beach CCA would be the first 100% renewable CCA in California.

Scenario Results

Five Year Total (2017-2021)	
Total Revenues	$29,840,700
Total Costs	$21,246,400
Total Retained CCA Revenue	$8,594,300

It is feasible for the City of Solana Beach to implement CCA, depending on the costs of operation and energy procured by the program. By setting rates at a level that would produce cost parity with SDG&E, the City's CCA could save approximately $1.4 million for its ratepayers annually. Over five years of operation, accounting for all costs, the community savings has a nominal total of approximately $8.5 million as summarized in the table above factoring cost and growth assumptions. The savings available to the City can be allocated in three ways – to increase the CCA's renewable portfolio, to provide a rate reduction for customers, and to accumulate revenue to set aside as a reserve fund and for investment in local programs and projects.

It is important to observe that energy and capacity costs from built local renewable facilities, behind-the-meter renewables will be lower than the cost of RPS compliant power if avoided non-energy charges like transmission/distribution are considered. In addition, the cost of avoided energy demand from energy efficiency measures is lower than the cost of conventional power, not to mention avoided non-energy volumetric charges, as previously noted. Financing and building renewables and efficiency locally vs. buying grid renewables introduces non-linear changes in the cost basis of service, under which significantly greener power need not cost more than conventional power, nor require

premium pricing to acquire like grid renewables and RECs do. As such, the analysis of these scenarios should be used to demonstrate CCA feasibility, and the City should carry out further work for resource planning and program design prior to launching a CCA.

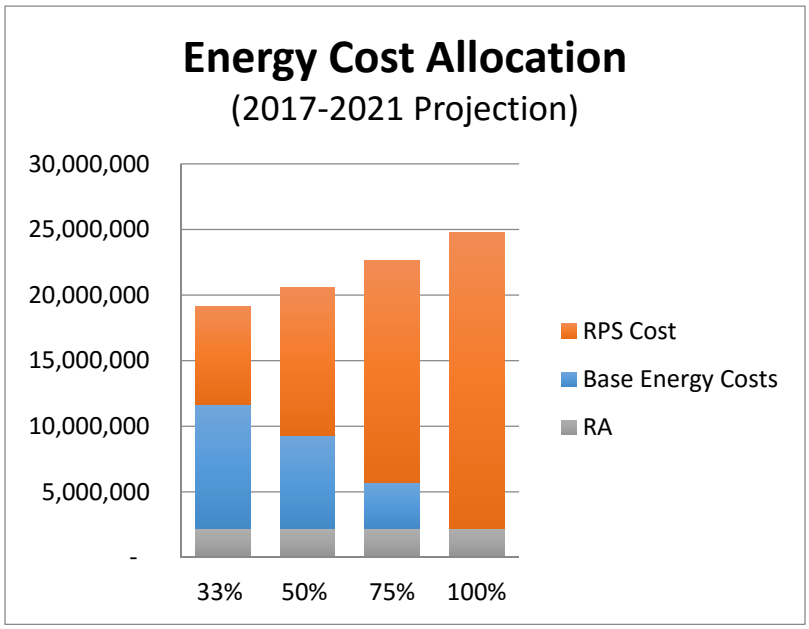
Several other factors are important to consider when comparing the four portfolio scenarios. Whereas renewable grid power and REC costs fluctuate, built renewables and efficiency are fixed in price. Moreover, carbon reductions from built renewables and energy efficiency, which eliminate demand from the bottom-up, far exceed carbon reductions from purchasing renewable power from the grid, which are centrally dispatched and require significant amounts of fossil backup power. Thus, the inclusion of behind-meter renewables and energy efficiency in these scenarios will both reduce and stabilize prices on the one hand, and create deeper greenhouse gas reductions on the other hand, than procuring renewable energy from the grid.

In evaluating the scenarios below, Solana Beach policymakers should understand the substantive differences in ecological benefits that result from building local renewables and efficiency versus purchasing renewable power from the grid.

Assuming Solana Beach would decide to commit its retained revenue to leverage investment in local renewables and efficiency, the scenario with the highest level of renewable power purchased from the grid (scenario 4) is not actually the "most renewable" scenario, though it is the highest-cost, lowest retained revenue scenario.

In contrast, the scenario with the least amount of renewable power purchased from the grid (scenario 1) retains the most funding to build local renewables and energy efficiency, and is therefore not actually the "least renewable" scenario. Thus, scenario 1 would in fact be the "most renewable" scenario based on the amount of newly built local renewables and energy efficiency measures if retained revenues are committed to leveraging local financing for this purpose.

The scenarios presented below present two comparisons: first, the comparison between a high and low RPS, and second, a comparison of paying more for higher renewable portfolio from the grid versus paying less and saving more to invest in local behind-meter renewables and energy efficiency. To use a familiar comparison that is meaningful to homeowners, it costs more to rent than to own. Choosing Scenario 4 is the equivalent of paying higher amount per month to rent a home in perfect condition, rather than spending less to own a home, and using the savings to improve the property (Scenario 1).

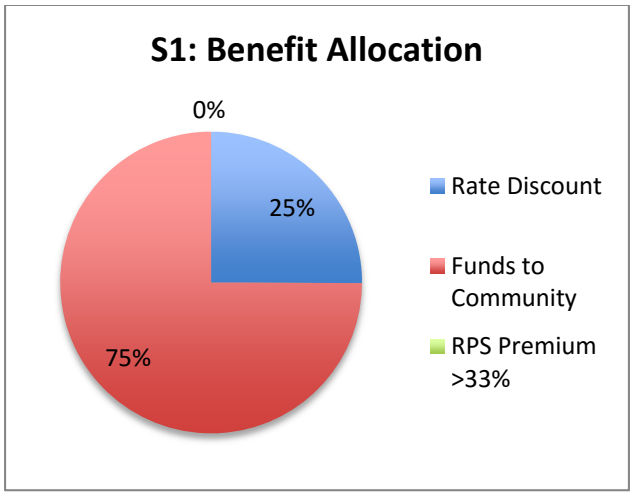


The City is primarily interested in increasing renewable energy provided to its CCA's customers. Without including built local renewables, behind-meter renewables and energy efficiency, purchased renewable power from the grid and RECs is more expensive than conventional power. Under this "additive" approach, the cost of energy increases as the portfolio becomes more renewable-heavy, which shifts the benefits from rate discounts and funds from lower bills through investment in reducing demand, to cleaner purchased energy from the grid. The neighboring chart shows 5-year projected energy costs rising from under $20M for compliance level RPS to nearly $25M for 100% renewable energy (Scenario 4 in this analysis).

The increase in energy cost directly impacts the ability to provide value in the form of rate discounts and retained program revenue to build local renewables and efficiency. Shown

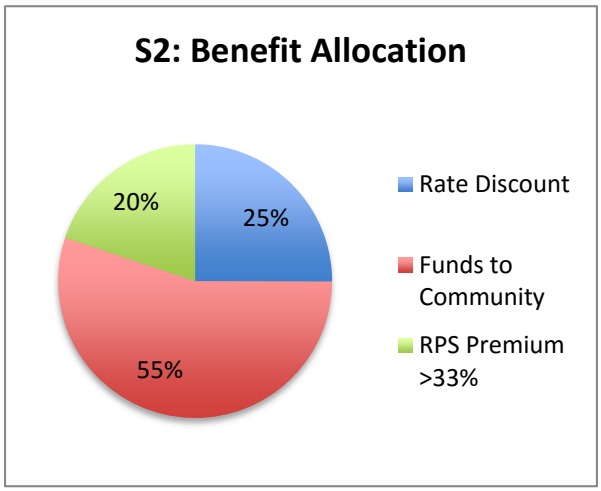
on an annual basis, the chart below highlights the declining financial resources available for these program benefits.

Scenario 1. This scenario includes an average 3% rate reduction for all customers in the CCA and produces the greatest amount of retained CCA revenue, 75%, for investment in related programs, such as building local renewables and installing energy efficiency, as services. Over the course of 5 years, the CCA's ratepayers could realize approximately $1.8M in savings with the CCA retaining approximately $6.7M. Using the majority of the $6.7M, the CCA could significantly increase customer savings under this scenario to an approximate average of 9% for all customers.



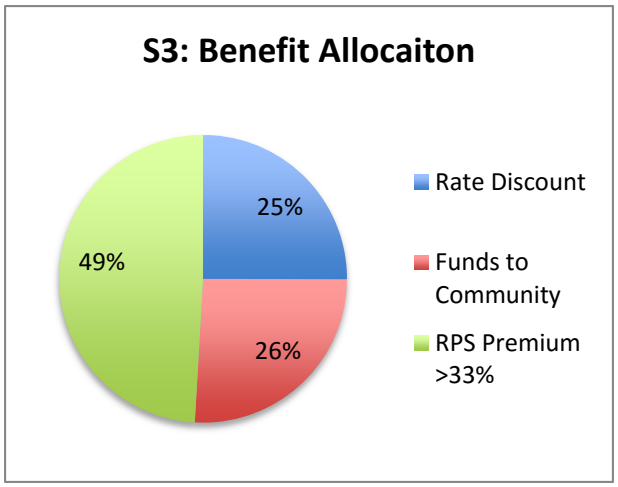
2017-2021	S1
Rate Discount Value	$1,809,200
Retained CCA Revenue	$6,785,100
RPS Premium >33%	$0
	$8,594,300

Scenario 2. This scenario includes an average 3% rate reduction for all customers in the CCA. A greater amount of program revenue is directed to purchasing renewable energy from the grid, totaling approximately $1.4M over 5 years. Over that time, the CCA's ratepayers could realize approximately $1.8M in savings with the CCA retaining approximately $5.3M to leverage investment in local renewables and energy efficiency, or for other purposes. Using the majority of the approximate $5.3M, the CCA could significantly increase customer savings under this scenario to an approximate average of 7% for all customers.



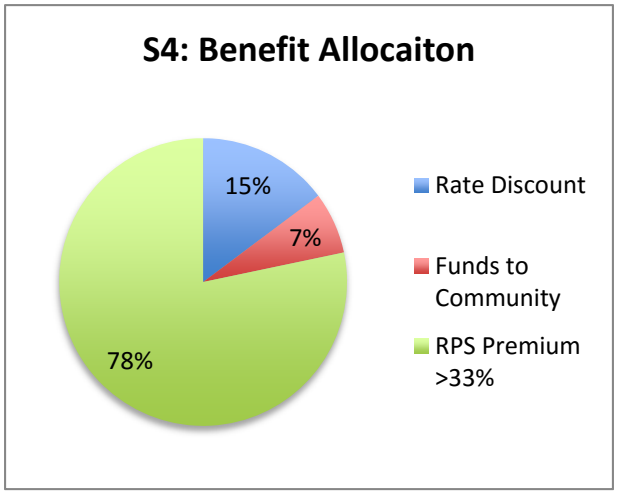
2017-2021	S2
Rate Discount Value	$1,809,200
Retained CCA Revenue	$5,350,900
RPS Premium >33%	$1,434,200
	$8,594,300

Scenario 3. This scenario includes an average 3% rate reduction for all customers in the CCA. Nearly half of the CCA's program revenue is directed to purchasing renewable energy from the grid, totaling approximately $3.5M above the baseline over 5 years. Over that time, the CCA's ratepayers could realize approximately $1.8M in savings with the CCA retaining approximately $3.2M to leverage investment in local renewables and energy efficiency. Based on the current assumptions, the City could potentially increase customer rate savings, but would leave the CCA without the ability to build program reserves or make additional investments in the community.



2017-2021	S3
Rate Discount Value	$1,809,200
Retained CCA Revenue	$3,241,700
RPS Premium >33%	$3,543,400
	$8,594,300

Scenario 4. This scenario includes a 1% rate reduction for all customers in the CCA. 78% of program revenue is directed to purchasing renewable energy from the grid, totaling approximately $5.6M above the baseline over 5 years. Over that time, the CCA's ratepayers could realize approximately $600,000 in savings with the CCA retaining approximately $2.3M to leverage investment in local renewables and energy efficiency. Thus, the premiums spent on purchasing renewable grid power would be lost for investment in local renewables and energy efficiency – effectively paying more to rent green power year to year rather than owning it for the long haul. Additional rate savings are not possible under the current assumptions, and the CCA's ability to build program reserves or make additional investments in the community is limited.

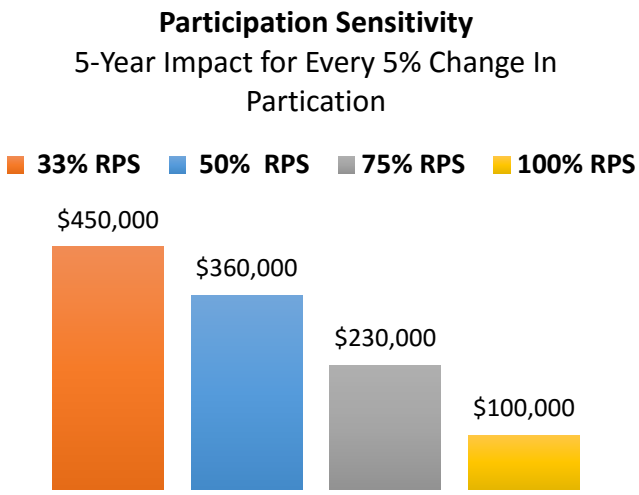


2017-2021	S4
Rate Discount Value	$603,100
Retained CCA Revenue	$2,338,700
RPS Premium >33%	$5,652,500
	$8,594,300

Sensitivity Analysis

While there are many variables that can be included in sensitivity analyses, the two most potentially impactful are 1) customer participation (opt-out rates) and 2) energy price volatility. In the first sensitivity we looked at customer participation to insure that potential low participation did not threaten the CCA. As noted, the base assumption is 80%

participation, which is a conservative assumption based on experience of existing CCAs. With that as the baseline, we tested a range from 70% to 90%.



The neighboring chart shows how, over the course of 5-years, a 5% change in participation rate has an appreciable impact on program revenue under each of the four scenarios. For example, if the community selected to use a 33% RPS portfolio and the participation rate was 85% instead of 80%, the community would gain approximately $450,000 in benefits over five years (or the opposite impact if it dropped to 75% instead of 80%).

While decreased participation rates would negatively impact the community benefits of the program, it would not likely cause any programmatic risk of failure at these levels.

The second sensitivity assessed the impact of energy price variability. Using the current rates in our analysis for energy and RPS, for we found that each $5/MWh change in energy price equates to approximately $325k change in community benefits. In order to maintain the same community benefits, this would require a rate increase of approximately $2.65 per average customer (or 6%).

During the CCA Implementation and Program Design phases, the CCA can choose how to plan for the energy volatility. Thoughtful and conservative procurement strategies can help to mitigate these prices fluctuations, and a CCA always has the ability to adjust rates and other program benefits. In addition, it is important to note that price volatility impacts all

market participants, and an increase in energy costs does not necessarily mean the CCA will have higher rates than the IOU.

Economic and Environmental Benefits

The City's CCA will have significant, positive economic impacts. Generally, because the City is geographically too small for large-scale utility energy projects, these benefits will be derived from the lower energy rates and investment of retained CCA revenue. In addition, lower electric rates provide an incentive for residential and commercial development in the City. The other major benefit is the City can fund energy efficiency and local renewable generation, such as financing for residents and businesses, a Targeted Efficiency program a Net Energy Metering program and/or Feed in Tariff, a Community Renewable Shares program, and/or a dynamic electric vehicle charging infrastructure program with special rates for EVs.

Numerous studies have demonstrated the positive job creation benefits of local revenue investment. This support comes through the direct, indirect, and induced impacts of the local investment. A general estimate indicates that between 17-20 jobs are supported by every $1M, which is the approximately baseline of annual retained revenue for the City's CCA. Based on this, and depending on how the City allocates revenue with the program and directs CCP to provide financing for customer owned behind meter generation and energy efficiency, the City can expect between a modest level and a significant level of job stimulus from the CCA.

Using program revenue to increase the CCA's renewable portfolio has the potential of creating significant environmental benefits. Any increase in renewable portfolio beyond the baseline of 33% will have immediate environmental benefits through reduced carbon emissions, as well as reducing other criteria pollutants that are emitted from power plants including SO2 and Nox, which are individually harmful but are also precursors of smog.

Based on SDG&E's current renewable portfolio of approximately 33%, a Solana Beach CCA portfolio with a renewable energy content could be responsible for removing as much as the equivalent of between 1,900 and 7,700 passenger cars a year, not burning between 10 million and 39 million pounds of coal, and removing CO_2 sequestered by between 7,600 and 30,000 acres of forest annually.[15] In addition to this, more CO_2 will be removed, than indicated in this analysis, through investment in behind-the-meter renewables and energy efficiency, which reduce the need for fossil backup for renewable supply, and decrease peak energy needed to meet mandated Resource Adequacy requirements.

The table on the following page details the projected carbon emissions for each scenario based on an RPS-only analysis, which does not include the GHG impacts of investing retained revenues in the development local renewables and energy efficiency. If the City of Solana Beach were to decide that all available retained revenues in each scenario *shall* be invested in local renewables and energy efficiency, then it may be possible to achieve greater emissions reductions by launching at a lower RPS level combined with significant local renewable construction and energy efficiency implementation. However, there may be practical limitations on the City's ability to do this, including commercial financing, geographic/weather conditions, and political considerations.

While Solana Beach has not yet decided as a matter of policy how it will spend retained revenue, or whether it will direct CCP to provide energy efficiency and local renewables financing to customers, residents and businesses receive substantial and enduring economic benefits from owning their source of electricity. There are thus very important socially progressive benefits to offering customer ownership in the form of financed Community Renewable Shares and financed energy efficiency with substantial economic multiplier effects for the entire community. Funds that are currently lost to purchasing

[15] This level of reduction would come from a 100% renewable energy portfolio CCA.

energy are transferred to wealth-generating assets, creating an additional layer of equity in the Solana Beach community with additional indirect multiplier effects benefiting the local economy. Finally, investment in local renewables and energy efficiency creates substantial direct local economic development benefits for local energy efficiency, solar, and other renewable energy installers. Hiring local business contractors is one of the major economic development goals of municipalities, and lists increasingly high on the list of policy criteria for CCAs in California.

Carbon Reductions for Modeled Scenarios				
	S1	**S2**	**S3**	**S4**
Renewable Content	33%	50%	75%	100%
Average CO Rate (lb./MWh)	1012	755	378	0
CO_2 Emissions (MTCO)	36,960	27,582	13,791	0
CO_2 Savings (tons)	N/A	9,378	23,169	36,960
Passenger vehicles driven (annual)	N/A	1,974	4,878	7,781
Pounds of coal burned (annual)	N/A	10,073,040	24,886,144	39,699,248
Acres of forest needed for carbon sequestration (annual)	N/A	7,687	18,991	30,295
Note: Table does not include the potential reductions from new local energy resources and from energy efficiency as noted in the narrative above.				

Implementation Considerations

Launching a CCA is a serious matter, requiring planning and design that incorporates mandated functions and local goals and priorities as well as mitigation strategies to minimize risk. While this report highlights these areas for program development and launch, the City should take on a more detailed planning process to identify a specific operational structure, CCA goals and timelines, procurement and risk management strategies, among other areas.

CCA Structures

There are several different models of CCA service provider in the market. The City of Solana Beach can establish a CCA program as its own program, or join neighboring jurisdictions to form a joint powers authority to operate a regional program. These options are not mutually exclusive, as the City can take the first step in forming a CCA with a goal of neighboring jurisdictions joining over time.

Single Jurisdiction

While many cities in the State are contemplating Community Choice, the City of Lancaster is the first single city to launch program operations on its own. By acting alone, the City of Lancaster is able to enjoy complete and autonomous control over its program decisions.

As previously noted, a significant hurdle to overcome for any jurisdiction is identifying funding to seed program start up and operation costs, including power purchases. However, the City of Lancaster, like all single cities that launch a program, will be able to use revenue generated from the electricity rates to both repay this initial financing as well

as fund and operate the program on an ongoing basis. The program requires internal staff with support for technical services provided by private contractors.

A single city may later expand to include other jurisdictions, including other cities or counties. Alternatively, a program could operate seamlessly alongside similar, but separately governed, Community Choice programs of nearby jurisdictions. The viability of this approach is driven by the costs to launch and fund ongoing operations. As noted in this report, these costs can reach approximately $1.8 - $2 million on an annual basis, without accounting for the cost of commercial financing. Because of this cost, it would be extremely difficult for the City of Solana Beach to establish and staff a new governmental agency similar to the City of Lancaster.

Joint Powers Authority (JPA)

MCE and SCP operate as Joint Powers Authorities, which offer certain operational advantages. These advantages come primarily from the financial protection a Joint Powers Authority provides to its participating members.

Just like a single city program, local communities retain complete control over program decisions. In contrast to a single city program, a JPA can generally create a larger Community Choice program. By aggregating several populations, a JPA provides the necessary scale to support a more robust staff infrastructure as well as the creation of increased revenue to for project investment and program development. Because a JPA governing board typically includes representatives from each participating agency, there is a potential drawback in that an individual community's unique goals may be diluted by the need to establish cooperative goals for the program.

Experience for both MCE and SCP, just as for the City of Lancaster, demonstrated funding as a critical challenge for program initiation. For MCE, a significant amount of funding came

from an anonymous donor; for SCP the majority of funding came from First Community Bank, a Sonoma County based financial institution. Successful operation of MCE and SCP has generated the necessary revenue to substantially repay debt and become cash-positive.

Based on the gross revenue and costs estimates, joining an existing JPA program or creating a new JPA with neighboring jurisdictions is a feasible approach for the City of Solana Beach. However, feasibility would depend on the willingness of an existing program to incorporate the City of Solana Beach.

Public-Private Partnership

All existing Community Choice programs use some level of service from private companies. Private companies with deep experience in the utility industry, including Community Choice and other non-utility energy service providers, typically bring a level of expertise and experience not customarily present in existing government staff. With the success of MCE, SCP, and Lancaster, there is a growing private sector field to provide services, such as billing, utility relations, customer services, power scheduling, settlements and others, to Community Choice programs.

California Clean Power is the only firm that provides a full service option for Community Choice programs, including the necessary funding to launch. California Clean Power provides many of the benefits of the approaches described above, such as providing a financial firewall for the government, while alleviating some of the critical challenges to launching a program, such as developing the expertise and funding needed.

Based on the load and market analysis provided in this report, the assumed financial considerations of a public-private partnership allow for a feasible CCA, and could provide a range of rate, revenue, and renewable portfolio benefits highlighted in this report.

Legal & Regulatory Requirements

There are specific legal requirements for establishing Community Choice, as well as operational considerations that will take on varying importance depending on community priorities. The legal requirements for establishing a Community Choice program are detailed in CPUC, primarily Section 366.216 but also in other California statutes and CPUC decisions and guidance. These steps include:

Under nearly all circumstances, once a governing board – such as a City Council or a Board of Supervisors – is prepared to move forward with establishing a Community Choice program, the first step is to pass an ordinance consistent with the PUC Section 366.2(c)(12).

Preparation of a Community Choice Implementation Plan and Statement of Intent for submission to the CPUC.17 Pursuant to PUC Section 366.2(c)(3), the Implementation Plan must ultimately be considered and adopted at a duly noticed public hearing of the Community governing body and shall contain all of the following:

- An organizational structure of the program, its operations, and its funding.
- Rate setting and other costs to participants.
- Provisions for disclosure and due process in setting rates and allocating costs among participants.
- The methods for entering and terminating agreements with other entities.

16 Public Utilities Code (PUC Section 360-380.5): http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=00001-01000&file=360-380.5

17 For information related to Implementation Plans and Statements of Intent, see: http://www.cpuc.ca.gov/PUC/energy/Retail+Electric+Markets+and+Finance/070430_ccaggregation.htm as well as MCE http://www.mcecleanenergy.org; Sonoma Clean Power https://sonomacleanpower.org; and Lancaster Choice Energy www.lancasterchoiceenergy.com/index.php

- The rights and responsibilities of program participants, including, but not limited to, consumer protection procedures, credit issues, and shutoff procedures.
- Termination of the program.
- A description of the third parties that will be supplying electricity under the program, including, but not limited to, information about financial, technical, and operational capabilities.
- Pursuant to PUC Section 366.2(c)(4), the Statement of Intent must state that the Community Choice program will provide for the following:
    - Universal Access.
    - Reliability.
    - Equitable treatment of all classes of customers.

Concurrent with the preparation of the CPUC submissions, a Community Choice service agreement is executed with the IOU, and a bond or collateral is posted in accordance with the IOU service agreement. As indicated in PUC Section 394.25(e), a "re-entry" bond, which is currently set at $100,000, must be posted with the CPUC to cover costs related to the involuntary return of a community from Community Choice service to utility service.

CCP recommends executing the IOU service agreement concurrently with work on the Implementation Plan and Statement of Intent as all three agreements must be submitted to the CPUC. Following the CPUC adoption of the Implementation Plan, the Statement of Intent, and the utility service agreement, the Community Choice program must also formally register with the CPUC.

After all the submissions are deemed complete and sufficient, pursuant to PUC Section 366.2(c)(7), the CPUC has 90 days to certify the receipt of all needed Community Choice submissions, thereby allowing the program to begin service to customers. Consistent with CPUC Decision 05-12-041, the CPUC does not "approve" or "reject" the Implementation Plan, but rather certifies that the Community Choice plans and program elements are

consistent with law, regulations and CPUC rules designed to protect customers. The CPUC also determines the appropriate costs, known as the Power Charge Indifference Adjustment (PCIA), to be assessed Community Choice customers. Because electric energy is frequently secured through long-term commitments, the essential purpose of the PCIA is to ensure that customers that continue to receive utility electric energy do not pay over market costs that would otherwise be paid by the departing Community Choice customers.

Existing programs have undertaken a range of public engagement efforts, some extending multiple years. Some of these activities have included adopting resolutions of support from city councils, holding public forums and town hall style education forums, conducting feasibility reports, and establishing of community advisory boards. While good government practice includes measures of public engagement, a community's desire to take these discretionary pre-formation steps will depend greatly on local community expectations and conditions, as well as the community's budget as these activities can require significant resources.

Community Choice program must also consider the necessary day-to-day activities that are needed to operate a successful program. Broadly categorized, these activities include financing; power procurement and scheduling; regulatory and compliance; customer service and billing; policy and advocacy; and general administration and programs.

Financing

Financing is a critical element to launching a CCA. To date, the lack of capital to fund CCA development and launch has been one of the primary impediments to CCA growth. Each jurisdiction should create its own program, shaped to meet community priorities and climate goals. Because of this, exact overhead costs, including those costs that scale on a per unit basis, are not available with complete certainty. However, based on the initial

operating costs of currently operational CCAs, we can estimate the annual minimum expense at approximately $1.8 - $2M million.

A jurisdiction must also consider several categories of mandatory one-time start-up fees and bonds that would be incurred in the months preceding program launch and in the first year. Prior to launch, costs for any studies, outreach, and program planning are necessary. Noticing requirements, mandated by the regulations governing CCAs, are subject to costs of design, printing, and postage charges, with a low total estimate of approximately $20,000. The CPUC requires posting of a $100,000 bond. The CAISO also requires a $500,000 bond be posted for any entity registering as a market participant to schedule load. To initiate energy purchases, an additional several million dollars can also be required.

Excluding energy procurement and one-time start-up costs, core ongoing operating categories include: Data Management and Call Center Services; SDG&E Service Fees; Personnel and Technical Consulting; and General Administration, Outside Legal and Accounting Support.

- Data Management and Call Center Services: Usually charged on a per-account basis, and scaled to the size of the CCA.

- Service Fees: Fees charged per-account to perform consolidated billing, combining the CCA's bill component with the total SDG&E utility bill.

- Personnel and Technical Consulting: An estimated minimum core team of qualified individuals with experience in management, legal affairs, procurement, and regulatory activities should be in place for a CCA. This cost category does not scale and should be in place for both small and large CCA programs.

- General Administration, Outside Legal and Accounting Support: While these costs will vary to a degree with the size of the CCA, there is less variability to account for in general feasibility estimates.

Procurement and Scheduling

Power procurement and scheduling are inextricably linked in that they reference the act of securing power for customers, and matching that power with actual customer use. Power procurement and scheduling related costs can represent 90% of total Community Choice expenses. Considerable cash, collateral or equivalent funds are needed to securitize power purchasing, and highly experienced professionals should oversee power procurement and scheduling. Depending on the size of the community, the security can range from the low millions of dollars to many millions of dollars. A relationship must also be established with the California Independent System Operator to deliver power to customers (CAISO).[18]

Implicit in the discussion of power procurement is the need for sufficient financing to purchase power as well as sufficient resources to fund the infrastructure needed to operate the Community Choice program itself. The precise amount of financing needed depends greatly on several variables, such as the size of community and amount of power needed, collateral requirements of power sellers, desired size of program staff and infrastructure. The experience of existing programs has shown this initial capital need to be in the multiple millions of dollars, which can eventually be recovered through successful operation of the program over time.

18 The CAISO is an independent nonprofit public benefit corporation that serves as the impartial grid operator for the bulk of the state's power grid, and opens access to the wholesale power market that is designed to diversify resources and lower prices.

Noticing

Related to regulatory and compliance activities, PUC Section 366.2(c) provides for noticing requirements. Specifically, prior to launching service, a Community Choice program must provide written notices to all customers twice in the two months prior to the start of service and twice in the two months following the start of service. The notices must inform the customer of automatic enrollment in the Community Choice program, the terms and conditions of the services offered, and a mechanism for opting out of the Community Choice program.

A number of other ongoing regulatory and compliance requirements related to procurement (e.g. Resource Adequacy and Renewable Portfolio Standard), customer service (e.g. new and departing customers), and Community Choice in general (e.g. joint rate mailers) also apply. Assistance from highly experienced professionals is also needed in these areas, either as staff of the Community Choice program or via a contractual relationship to ensure the Community Choice program remains in compliance. These include, but are not limited to:

- CPUC Resource Adequacy
- CPUC Renewable Portfolio Standard
- CPUC Energy Efficiency
- CPUC Emission Performance Standard
- CPUC Storage
- CEC Power Source Disclosure
- CEC Integrated Energy Policy Report
- CAISO Audit
- CARB Retail Load Reporting
- Local and State Permitting

There have been overt and subtle attacks on CCAs, and these are likely to continue. Proposition 16, which would have required a 2/3 community vote before a CCA could be established, and AB 2145 which would have required consumers to "opt-in" to a CCA program, would have both been lethal to CCA formation. While it is difficult to predict future legislation, this is an area of regulatory consideration for all CCAs to consider.

Customer Service and Billing

Another central component of a Community Choice program is customer service and billing. On behalf of the Community Choice program, the IOU sends a standard bill to Community Choice customers for the electric energy portion of the total utility bill, and then remits the payments to the Community Choice program. The Community Choice program must collect the electric usage data from the IOU, compute the amount of the bill, and relay the billing information back to the utility for inclusion on the utility bill.

While not required by law or regulation, Community Choice programs are well served by providing a call center and a website to assist customers in easily finding information about the program, choosing among the services provided by their community, or opting out of the program. The utility continues to process the vast majority of electric service related customer service inquiries since few functions are entirely within the domain of the Community Choice program. For this reason, providing a call center and a website that addresses areas that are strictly within the Community Choice program's purview promotes good will and best customer service practices.

Policy Support and Advocacy

Policy support and advocacy regarding issues of importance to Community Choice programs is highly advisable. Due to the considerable Community Choice regulatory and

compliance requirements, understanding, tracking and responding to changes in these areas is important to the long-term well-being of Community Choice programs.

Prior efforts to establish Community Choice provide a view of the legislative and advocacy landscape in California. Indeed, networks of community activists, non-profit organizations, local governments along with Marin Clean Energy and Sonoma Clean Power, engaged in a number of advocacy efforts to help establish and protect Community Choice as a successful and viable model for local electricity services. Just as it has been important to early success, strong coordination and participation in this area is important to the long-term success of Community Choice.

Community Choice programs should also establish daily administrative and operational oversight of procurement and scheduling, regulatory and compliance, and customer service and billing. This function should include the typical administrative functions needed in most enterprises such as accounting, finance, clerical and information technology support.

General Administration and Programs

Community Choice programs are not required to offer services in addition to the provision of electric energy. However, many communities may find additional programming and services desirable, to not only reduce rates or green the supply, but also reduce bills and offer customers the opportunity for equity from their monthly bill payments. Examples of additional programming and services include energy efficiency programs such as audits or rebates, Community Solar Shares, Targeted Efficiency, Feed in Tariffs, Net Energy Metering or other ways of leveraging the Community Choice program to encourage the development of small-scale generation projects within the jurisdiction. Administering these programs typically require staff support and coordination in addition to leveraging the Community Choice program's financial resources, but CCP is prepared to provide both financial and technical support based on direction by Solana Beach to deliver such services.

Each of these programs – those listed above or others – can be structured to meet community needs and priorities. There is growing innovation in this area within existing Community Choice programs as well as non-profit and entrepreneurial companies that are seeking opportunities to test new ideas and meet a demand for existing services.

Risk Considerations

There are several reports and studies that provide a discussion of operational risks associated with Community Choice.[19] While there is always some level of risk in establishing a Community Choice program – just as there is risk with any endeavor in the public or private sector – these reports call out various strategies to either eliminate or mitigate risks. Although there are various permutations of pre-launch, operational, and other risks, two primary themes arise in financial or market risk and regulatory or legislative risk.

The single greatest risk to any Community Choice program is financial, which is driven primarily by the volatility of the energy market. If energy prices exceed forecasts, leaving a Community Choice program with a revenue shortage, the program will likely need to raise customer rates to cover the shortage. Similar price risks can occur with scheduling that result in over or underestimation of the amount of electric energy needed to serve customers. If the estimate is significantly inaccurate, the Community Choice program can incur expenses related to the cost of buying or selling electric energy in the spot, or real time, market. These risks can also lead to unexpected migration of customers from the

[19] Report of the Feasibility of Community Choice Aggregation in Sonoma County, Dalessi Management Consulting/MRW Associates, October 2011; The City of Hermosa Beach: Assessing Community Choice Aggregation, UCLA, June 2014; Community Choice Aggregation Base Case Feasibility Evaluation, Navigant Consulting, May 2005; Community Choice Aggregation: The Viability of AB 117 and Its Role in California Energy Markets, UC Berkeley, June 2005; Community Choice Aggregation, Local Government Commission.

Community Choice program back to the utility (thereby decreasing the amount of forecasted revenue from customers).

Proper and prudent risk management strategies along with best management practices help to mitigate these risks. In addition, through Community Choice, local communities can help to further mitigate these risks by creating locally controlled generation projects, which offer fixed rather than fluctuating prices to all customers. When installed behind-the meter, such projects also eliminate fluctuating volumetric charges such as distribution charges to participating customers. It should also be noted, as highlighted at the outset of this report, municipal providers have generally been able to manage financial and market risks as successfully – if not more successfully by some measures – than the IOUs in California.

Changes to laws and regulations that impose additional burdens on the Community Choice may present a significant risk. In 2014, AB2145 proposed key changes, one of which was to remove the default provider status that would have dramatically impacted the viability of starting new Community Choice programs. AB2145 died on the California Senate floor, in no small part due to community advocacy that raised awareness of the bill's potential grave impact on the viability of Community Choice Aggregation. While it is impossible to determine what future regulation and legislation might be, the uncertainty is precisely why this remains an ongoing risk. Active and coordinated engagement with State policy makers and regulators, therefore, is an important mitigation strategy.

Below is a brief overview of the risks to be expected and the general approach to managing the risks in the following table:

Community Choice Risks		
Risk Type	**Description**	**Management Technique**
Market (Price)	Risk due to changes in the market prices of energy.	Establishing and monitoring risk limits and tolerance, understanding sources of risk, and managing the energy portfolio accordingly.
Volumetric	The risk of unexpected fluctuations in retail load or energy availability and their impact on revenue.	Establishing adequate reserves, diversifying portfolio and reducing concentration, and refining and evaluating load forecasts.
Operation and Organization	The risk that internal controls or information systems cause a failure that impacts business activities and result in economic loss.	Establishing proper supervision and segregation of duties and independent backup systems for compliance monitoring.
Counterparty Credit	Exposure to economic loss resulting from a counterparty not performing or defaulting.	Monitoring of credit exposure relative to approved limits. Contract with multiple suppliers to reduce exposure
Regulatory and Legal	The risk that contracts are not legally enforceable or documented correctly; that regulatory agencies adopt measures that adversely impact the portfolio value.	Establishing clear compliance and regulatory structures, and maintaining an active legal and regulatory review program.

Conclusions

This Feasibility Analysis demonstrates that Solana Beach can develop a CCA that is economically competitive and environmentally superior to the service provided by SDG&E currently. This comes through the ability of the CCA to provide substantially cleaner energy to its customers at less cost under a range of scenarios. Further, the analysis shows the CCA could retain substantial revenue that could then be invested in the community to further environmental and economic goals.

Over five years of operation, accounting for all costs, the community savings potential for the community of Solana Beach has a nominal total value of approximately $8.5 million. When this savings is allocated amongst the primary benefits of CCA – RPS, rate savings, and retained revenue – the City's CCA can make profound gains in the renewable energy consumption of its customers while generating several million dollars of rate savings.

The City's stated goal to aggressively pursue high levels of renewable energy would also result in significant environmental benefits. Based on how the City designs its program, the CCA has the potential of removing as much as the equivalent of 7,700 passenger cars a year or preventing CO_2 emissions equivalent to that sequestered by 30,000 acres of forest annually.

There are some risks to launching and operating CCA for the City. However, these risks are known and have been successfully mitigated by operating CCAs. Having demonstrated the feasibility of CCA, the City would be wise to carry out thoughtful and conservative planning, incorporating the lessons learned from other CCAs in regard to operations, procurement, and risk management as part of its program development.

While the City of Solana Beach is too small to fund and staff a CCA on its own, the City can establish a CCA through a public-private partnership that delivers all of the financial and

operational services needed. The costs of such a partnership are estimated within this analysis, demonstrating the financial viability of this path. In addition, launching as a single city CCA would open the door to expanding the City's program into a multi-jurisdictional, or regional, program. The City should conduct its own due diligence for providers of this service, although to date California Clean Power is the only provider to offer service to all sizes of jurisdictions with no direct financial cost for development and launch.

Energy and capacity prices in the wholesale market are currently very low, allowing for substantial customer savings and retained CCA revenue. This provides the City of Solana Beach with substantial flexibility and lower risk. Given this market opportunity and environmental goals of the City, moving forward quickly toward implementation and launching CCA is highly advisable.

Appendix

Glossary of Terms

AB	Assembly Bill
ARB	Air Resources Board
CAISO	California Independent System Operator
CAM	Cost Allocation Method
CBA	California Balancing Authority
CCA	Community Choice Aggregation
CEC	California Energy Commission
CPUC	California Public Utilities Commission
CRS	Community Renewable Shares
DA	Direct Access
DLAP	Default Load Aggregation Point
EPA	Environmental Protection Agency
EV	Electric Vehicle
FIT	Feed In Tariff
GHG	Greenhouse Gas
ICE	Intercontinental Exchange
IOU	Investor Owner Utility
ITC	Investment Tax Credit
JPA	Joint Powers Authority
KW	Kilowatt
kWh	Kilowatt hour
LBNL	Lawrence Berkeley National Laboratory
LCE	Lancaster Choice Energy
LSE	Load Serving Entity
MCE	Marin Clean Energy
MT	Metric Ton

MTCO	Metric Tons of Carbon Dioxide
MW	Megawatt
MWh	Megawatt hour
NEM	Net Energy Metering
NP15	North of Path 15
NREL	National Renewable Energy Laboratory
OTC	Once Through Cooling
SCP	Sonoma Clean Power
SDG&E	San Diego Gas & Electric Company
PCIA	Power Charge Indifference Adjustment
POU	Publicly Owned Utility
PPA	Power Purchase Agreement
PV	Photovoltaic
RA	Resource Adequacy
RECs	Renewable Energy Credits
RPS	Renewable Portfolio Standard
SB	Senate Bill
SCE	Southern California Edison
SCP	Sonoma Clean Power
SDG&E	San Diego Gas & Electric
SONGS	San Onofre Nuclear Generating Station
SP15	South of Path 15
SQMD	Settlement Quality Meter Data

CCA Scenario Financial Output

These tables provide summary output from CCP's proprietary rate analysis tool. The summary outputs show a single year (2016) analysis of costs and revenue for each of the scenarios included in this report. Customer and load data assume a 20% opt-out rate and the removal of DA customers.

YEAR 1 SCENARIO 1: 33% RPS; 3% RATE REDUCTION																	
	NET 2016 LOAD & ACCOUNTS (rounded)		SDG&E WEIGHTED AVERAGE COSTS BILLED TO CCA CUSTOMERS				CCA CUSTOMER BILL				COMMUNITY BENEFITS ($)			TOTAL CCA BENEFIT ALLOCATION			
CLASS	PROJECTED LOAD	PROJECTED # OF ACCOUNTS	UDC RATE ($/MWh)	METER & BILLING ($/MWh)	PCIA ($/MWh)	TOTAL SDGE COSTS ($/Mwh)	CCA POWER COSTS ($/MWh)	OVERHEAD ($/MWh)	SDGE COSTS ($/MWh)	TOTAL BILL ($/MWh)	SDGE BUNDLED RATE ($/MWh)	CCA BILL ($/MWh)	BENEFITS ($/MWh)	TOTAL BENEFITS ($)	UNCOLLECTED ($)	RATE DISCOUNTS ($)	RETAINED CCA REVENUE
RESIDENTIAL	32,240	5,480	$81.31	$1.02	$12.78	$95.11	$52.22	$5.75	$95.11	$153.09	$180.42	$153.09	$27.33	$881,300	($12,900)	($174,500)	$693,900
SMALL COMMERCIAL	12,620	610	$51.80	$0.29	$14.51	$66.60	$52.22	$5.75	$66.60	$124.57	$141.90	$124.57	$17.33	$218,700	($4,500)	($53,700)	$160,500
MEDIUM COMMERCIAL	18,810	70	$79.85	$0.02	$11.14	$91.01	$52.22	$5.75	$91.01	$148.98	$167.93	$148.98	$18.94	$356,300	($6,800)	($94,800)	$254,700
LIGHTING SMALL COMMERCIAL	490	11	$11.86	$0.08	$0.00	$11.94	$52.22	$5.75	$11.94	$69.91	$76.81	$69.91	$6.90	$3,400	($150)	($1,100)	$2,150
OUTDOOR LIGHTING RESIDENTIAL	10	2	$44.53	$1.84	$0.00	$46.37	$52.22	$5.75	$46.37	$104.34	$109.48	$104.34	$5.13	$50	($2)	($20)	$30
AGRICULTURE	110	2	$12.40	$0.13	$8.19	$20.71	$52.22	$5.75	$20.71	$78.69	$92.74	$78.69	$14.05	$1,500	($40)	($300)	$1,160
TOTAL	64,280	6,175												$1,461,250	($24,391)	($324,420)	$1,112,440

YEAR 1 SCENARIO 2: 50% RPS; 3% RATE REDUCTION																	
	NET 2016 LOAD & ACCOUNTS (rounded)		SDG&E WEIGHTED AVERAGE COSTS BILLED TO CCA CUSTOMERS				CCA CUSTOMER BILL				COMMUNITY BENEFITS ($)			TOTAL CCA BENEFIT ALLOCATION			
CLASS	PROJECTED LOAD	PROJECTED # OF ACCOUNTS	UDC RATE ($/MWh)	METER & BILLING ($/MWh)	PCIA ($/MWh)	TOTAL SDGE COSTS ($/Mwh)	CCA POWER COSTS ($/MWh)	OVERHEAD ($/MWh)	SDGE COSTS ($/MWh)	TOTAL BILL ($/MWh)	SDGE BUNDLED RATE ($/MWh)	CCA BILL ($/MWh)	BENEFITS ($/MWh)	TOTAL BENEFITS ($)	UNCOLLECTED ($)	RATE DISCOUNTS ($)	NET FUNDS TO CCA
RESIDENTIAL	32,240	5,480	$81.31	$1.02	$12.78	$95.11	$52.22	$5.75	$95.11	$153.09	$180.42	$153.09	$27.33	$881,300	($12,900)	($174,500)	$559,600
SMALL COMMERCIAL	12,620	610	$51.80	$0.29	$14.51	$66.60	$52.22	$5.75	$66.60	$124.57	$141.90	$124.57	$17.33	$218,700	($4,500)	($53,700)	$107,900
MEDIUM COMMERCIAL	18,810	70	$79.85	$0.02	$11.14	$91.01	$52.22	$5.75	$91.01	$148.98	$167.93	$148.98	$18.94	$356,300	($6,800)	($94,800)	$176,300
LIGHTING SMALL COMMERCIAL	490	11	$11.86	$0.08	$0.00	$11.94	$52.22	$5.75	$11.94	$69.91	$76.81	$69.91	$6.90	$3,400	($150)	($1,100)	$150
OUTDOOR LIGHTING RESIDENTIAL	10	2	$44.53	$1.84	$0.00	$46.37	$52.22	$5.75	$46.37	$104.34	$109.48	$104.34	$5.13	$50	($2)	($20)	$30
AGRICULTURE	110	2	$12.40	$0.13	$8.19	$20.71	$52.22	$5.75	$20.71	$78.69	$92.74	$78.69	$14.05	$1,500	($40)	($300)	$660
TOTAL	64,280	6,175												$1,461,250	($24,400)	($324,400)	$844,600

YEAR 1 SCENARIO 3: 75% RPS; 3% RATE REDUCTION																	
	NET 2016 LOAD & ACCOUNTS (rounded)		SDG&E WEIGHTED AVERAGE COSTS BILLED TO CCA CUSTOMERS				CCA CUSTOMER BILL				COMMUNITY BENEFITS ($)			TOTAL CCA BENEFIT ALLOCATION			
CLASS	PROJECTED LOAD	PROJECTED # OF ACCOUNTS	UDC RATE ($/MWh)	METER & BILLING ($/MWh)	PCIA ($/MWh)	TOTAL SDGE COSTS ($/Mwh)	CCA POWER COSTS ($/MWh)	OVERHEAD ($/MWh)	SDGE COSTS ($/MWh)	TOTAL BILL ($/MWh)	SDGE BUNDLED RATE ($/MWh)	CCA BILL ($/MWh)	BENEFITS ($/MWh)	TOTAL BENEFITS ($)	UNCOLLECTED ($)	RATE DISCOUNTS ($)	NET FUNDS TO CCA
RESIDENTIAL	32,240	5,480	$81.31	$1.02	$12.78	$95.11	$52.22	$5.75	$95.11	$153.09	$180.42	$153.09	$27.33	$881,300	($12,900)	($174,500)	$358,100
SMALL COMMERCIAL	12,620	610	$51.80	$0.29	$14.51	$66.60	$52.22	$5.75	$66.60	$124.57	$141.90	$124.57	$17.33	$218,700	($4,500)	($53,700)	$29,000
MEDIUM COMMERCIAL	18,810	70	$79.85	$0.02	$11.14	$91.01	$52.22	$5.75	$91.01	$148.98	$167.93	$148.98	$18.94	$356,300	($6,800)	($94,800)	$58,800
LIGHTING SMALL COMMERCIAL	490	11	$11.86	$0.08	$0.00	$11.94	$52.22	$5.75	$11.94	$69.91	$76.81	$69.91	$6.90	$3,400	($150)	($1,100)	($2,950)
OUTDOOR LIGHTING RESIDENTIAL	10	2	$44.53	$1.84	$0.00	$46.37	$52.22	$5.75	$46.37	$104.34	$109.48	$104.34	$5.13	$50	($2)	($20)	($70)
AGRICULTURE	110	2	$12.40	$0.13	$8.19	$20.71	$52.22	$5.75	$20.71	$78.69	$92.74	$78.69	$14.05	$1,500	($40)	($300)	$10
TOTAL	64,280	6,175												$1,461,250	($24,400)	($324,400)	$442,900

YEAR 1 SCENARIO 4: 100% RPS; 1% RATE REDUCTION																	
	NET 2016 LOAD & ACCOUNTS (rounded)		SDG&E WEIGHTED AVERAGE COSTS BILLED TO CCA CUSTOMERS				CCA CUSTOMER BILL				COMMUNITY BENEFITS ($)			TOTAL BENEFIT ALLOCATION			
CLASS	PROJECTED LOAD	PROJECTED # OF ACCOUNTS	UDC RATE ($/MWh)	METER & BILLING ($/MWh)	PCIA ($/MWh)	TOTAL SDGE COSTS ($/Mwh)	CCA POWER COSTS ($/MWh)	OVERHEAD ($/MWh)	SDGE COSTS ($/MWh)	TOTAL BILL ($/MWh)	SDGE BUNDLED RATE ($/MWh)	CCA BILL ($/MWh)	BENEFITS ($/MWh)	TOTAL BENEFITS ($)	UNCOLLECTED ($)	RATE DISCOUNTS ($)	NET FUNDS TO CCA
RESIDENTIAL	32,240	5,480	$81.31	$1.02	$12.78	$95.11	$52.22	$5.75	$95.11	$153.09	$180.42	$153.09	$27.33	$881,300	($12,900)	($58,200)	$272,900
SMALL COMMERCIAL	12,620	610	$51.80	$0.29	$14.51	$66.60	$52.22	$5.75	$66.60	$124.57	$141.90	$124.57	$17.33	$218,700	($4,500)	($17,900)	($14,000)
MEDIUM COMMERCIAL	18,810	70	$79.85	$0.02	$11.14	$91.01	$52.22	$5.75	$91.01	$148.98	$167.93	$148.98	$18.94	$356,300	($6,800)	($31,600)	$4,400
LIGHTING SMALL COMMERCIAL	490	11	$11.86	$0.08	$0.00	$11.94	$52.22	$5.75	$11.94	$69.91	$76.81	$69.91	$6.90	$3,400	($150)	($400)	($5,350)
OUTDOOR LIGHTING RESIDENTIAL	10	2	$44.53	$1.84	$0.00	$46.37	$52.22	$5.75	$46.37	$104.34	$109.48	$104.34	$5.13	$50	($2)	$0	($150)
AGRICULTURE	110	2	$12.40	$0.13	$8.19	$20.71	$52.22	$5.75	$20.71	$78.69	$92.74	$78.69	$14.05	$1,500	($40)	($100)	($440)
TOTAL	64,280	6,175												$1,461,250	($24,400)	($108,200)	$257,400

S1: 2017 - 2021 CCA FINANCIAL FORECAST						
	2017	2018	2019	2020	2021	2017-2021 TOTAL
Projected Load	65,100	65,900	66,800	67,700	68,600	334,100
Total Revenues	$5,450,200	$5,707,500	$5,984,200	$6,272,200	$6,576,600	$29,990,700
3% Rate Savings	333,300	346,800	361,200	376,200	391,700	1,809,200
Uncollected	27,300	28,500	29,900	31,400	32,900	150,000
Net Revenue	$5,089,600	$5,332,200	$5,593,100	$5,864,600	$6,152,000	$28,031,500
Base Energy Costs	2,610,700	2,689,800	2,798,600	2,951,900	3,093,500	14,144,500
RPS Premium	542,500	549,200	556,700	564,200	571,700	2,784,300
RA	428,600	433,800	439,800	445,700	451,600	2,199,500
Management & Billing	413,500	418,100	423,500	428,800	434,200	2,118,100
Energy Costs	$3,995,300	$4,090,900	$4,218,600	$4,390,600	$4,551,000	$21,246,400
Retained CCA Revenue	$1,094,300	$1,241,300	$1,374,500	$1,474,000	$1,601,000	$6,785,100

S2: 2017 - 2021 CCA FINANCIAL FORECAST						
	2017	2018	2019	2020	2021	2017-2021 TOTAL
Projected Load	65,100	65,900	66,800	67,700	68,600	334,100
Total Revenues	$5,450,200	$5,707,500	$5,984,200	$6,272,200	$6,576,600	$29,990,700
3% Rate Savings	333,300	346,800	361,200	376,200	391,700	1,809,200
Uncollected	27,300	28,500	29,900	31,400	32,900	150,000
Net Revenue	$5,089,600	$5,332,200	$5,593,100	$5,864,600	$6,152,000	$28,031,500
Base Energy Costs	2,610,700	2,689,800	2,798,600	2,951,900	3,093,500	14,144,500
RPS Premium	822,000	832,100	843,400	854,800	866,200	4,218,500
RA	428,600	433,800	439,800	445,700	451,600	2,199,500
Management & Billing	413,500	418,100	423,500	428,800	434,200	2,118,100
Energy Costs	$4,274,800	$4,373,800	$4,505,300	$4,681,200	$4,845,500	$22,680,600
Retained CCA Revenue	$814,800	$958,400	$1,087,800	$1,183,400	$1,306,500	$5,350,900

These tables provide summary output showing 5-year forecasts (2017 - 2021) of costs and revenue for each of the scenarios included in this report.

Customer and load data assume a 20% opt-out rate and the removal of DA customers. A 3% rate reduction is included in scenarios 1, 2, and 3. Scenario 4 assumes a 1% as the maximum rate reduction possible.

S3: 2017 - 2021 CCA FINANCIAL FORECAST						
	2017	2018	2019	2020	2021	2017-2021 TOTAL
Projected Load	65,100	65,900	66,800	67,700	68,600	334,100
Total Revenues	$5,450,200	$5,707,500	$5,984,200	$6,272,200	$6,576,600	$29,990,700
3% Rate Savings	333,300	346,800	361,200	376,200	391,700	1,809,200
Uncollected	27,300	28,500	29,900	31,400	32,900	150,000
Net Revenue	$5,089,600	$5,332,200	$5,593,100	$5,864,600	$6,152,000	$28,031,500
Base Energy Costs	2,610,700	2,689,800	2,798,600	2,951,900	3,093,500	14,144,500
RPS Premium	1,233,000	1,248,100	1,265,200	1,282,200	1,299,200	6,327,700
RA	428,600	433,800	439,800	445,700	451,600	2,199,500
Management & Billing	413,500	418,100	423,500	428,800	434,200	2,118,100
Energy Costs	$4,685,800	$4,789,800	$4,927,100	$5,108,600	$5,278,500	$24,789,800
Retained CCA Revenue	$403,800	$542,400	$666,000	$756,000	$873,500	$3,241,700

S4: 2017 - 2021 CCA FINANCIAL FORECAST						
	2017	2018	2019	2020	2021	2017-2021 TOTAL
Projected Load	65,100	65,900	66,800	67,700	68,600	334,100
Total Revenues	$5,450,200	$5,707,500	$5,984,200	$6,272,200	$6,576,600	$29,990,700
1% Rate Savings	111,100	115,600	120,400	125,400	130,600	603,100
Uncollected	27,300	28,500	29,900	31,400	32,900	150,000
Net Revenue	$5,311,800	$5,563,400	$5,833,900	$6,115,400	$6,413,100	$29,237,600
Base Energy Costs	2,610,700	2,689,800	2,798,600	2,951,900	3,093,500	14,144,500
RPS Premium	1,643,900	1,664,100	1,686,900	1,709,600	1,732,300	8,436,800
RA	428,600	433,800	439,800	445,700	451,600	2,199,500
Management & Billing	413,500	418,100	423,500	428,800	434,200	2,118,100
Energy Costs	$5,096,700	$5,205,800	$5,348,800	$5,536,000	$5,711,600	$26,898,900
Retained CCA Revenue	$215,100	$357,600	$485,100	$579,400	$701,500	$2,338,700