The Potential for Community Choice Energy in the Heart of Silicon Valley

An Assessment Report for the Silicon Valley Community Choice Energy Partnership

CUPERTINO

THE COUNTY OF SANTA CLARA

CITY OF MOUNTAIN VIEW

CITY OF SUNNYVALE CALIFORNIA

LEAN ENERGY US

Local Energy Aggregation Network

PREPARED BY LEAN ENERGY US: MAY 14, 2015

Community Choice Energy in Silicon Valley
2015 Assessment Report

Prepared For:

Silicon Valley Community Choice Energy Partnership (SVCCEP)
Cities of Sunnyvale, Cupertino, Mountain View, Unincorporated Santa Clara County

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May 14, 2015

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Executive Summary

The Cities of Sunnyvale, Cupertino and Mountain View, and the County of Santa Clara (representing the unincorporated areas of the County), have formed an inter-jurisdictional partnership to explore the potential for implementing a Community Choice Energy (CCE) program in the South Bay.[1] Known as the Silicon Valley Community Choice Energy Partnership (SVCCEP), these jurisdictions have commissioned an initial assessment of CCE to help decision-makers determine whether to move to the next steps in establishing a CCE program in the South Bay. In providing the assessment, this report summarizes and compares the experiences of existing CCE programs, describes some of the risks and benefits of CCE programs, and identifies additional analysis that should be performed to support partner decision-making about program implementation.

Authorized by AB 117 (2002) and amended by SB 790 (2011), CCE permits city and county governments to pool their local electrical load in order to purchase electricity or invest in energy projects and programs for local residents and businesses as an alternative to generation services from the incumbent utility, Pacific Gas & Electric (PG&E). Numerous local governments in California are exploring CCE as a leading strategy to address the impacts of climate change and achieve the goals set forth in their Climate Action Plans. CCE programs are procuring cleaner power while also offering competitive (currently cheaper) electricity rates, creating new jobs and other local economic development opportunities.

CCE programs can be designed to achieve a variety of public policy and program objectives, such as increasing renewable resources in the community's energy portfolio, reducing greenhouse gas emissions, promoting local development of solar projects, and offering energy efficiency programs. CCE programs also provide electricity customers a choice between service providers, where no such choice currently exists. Existing CCE programs serving customers in Marin, Napa, Contra Costa and Sonoma Counties have been very successful thus far in providing cleaner energy supplies to their customers at rates that are lower than those of the incumbent utility. In its first five years of operation, Marin Clean Energy (MCE) has invested over $500 M in in-state and local renewable projects totaling over 225 MWs of new clean power and resulting in 1800 construction and related vendor jobs. Sonoma Clean Power (SCP) is taking a similar path, and in under a year of operation contracted for over 82 MWs of locally generated clean power at rates 6-14% lower than PGE's.

CCE programs offer many opportunities for local communities but, of course, present some risk. The main risks associated with CCE relate to market price fluctuations and regulatory uncertainty. California's energy markets have been stable for several years, and prices for electricity from renewable and conventional energy resources are low. The current buyer's market is expected to continue for the coming several years because California has excess energy supplies; however, energy markets could change and buyers should hedge their risks with diverse portfolios that include long-term energy supplies and investments in power projects and programs.

[1] State statute and regulatory forums refer to this program as "community choice aggregation (CCA)." This report uses the more descriptive term "community choice energy (CCE)," which is the term used by the jurisdictions commissioning this study.

Regulatory risk is difficult to predict. In recent years, the California Public Utilities Commission (CPUC) has not been particularly encouraging to CCEs, and has adopted some utility proposals for rates and services that have put CCEs at a disadvantage. PG&E may always have the advantage in regulatory forums because of its resources and political influence. On the other hand, MCE in particular has managed to chalk up some major successes in regulatory proceedings and has developed internal expertise that has benefited CCE prospects generally. These efforts will require support and complementary efforts in the future, as additional CCEs come on-line.

CCE success will also depend on realistic business strategies and sound management. MCE and SCP have developed best practices in all aspects of their operations and paved the way for other CCEs in terms of "debugging" many operational, technical, and customer service issues. Their early successes have encouraged vendors to serve CCE programs with tailored products, and CCE programs do not require any management or technical skills that are not readily available in the Bay Area and California more generally.

Experience in other jurisdictions suggests CCE development and implementation will require communications strategies to assure the program is accepted by local communities and that information about the program is accurate and timely. MCE and the City of San Francisco, in particular, have had to weather well-funded campaigns in opposition to CCE programs. Since the passage of SB 790 in 2011 however, public utility opposition and anti-marketing campaigns have decreased significantly. Neither Sonoma County nor the City of Lancaster experienced the level of anti-CCE campaigning that occurred in Marin and San Francisco.

Finally, while some aspects of CCE programs are becoming more standardized, they are still unique to each community in terms of goals, policy-setting and approach. MCE and SCP have tailored their program design and business strategies to suit community characteristics and program objectives, and it is likely that SVCCEP will want to design its own program according to local goals and program objectives and community characteristics.

Based on the experiences of other jurisdictions, this report finds that SVCCEP could begin providing municipal, residential and business customers CCE service by late 2016 for about $1.7 million in program development costs (including $100,000 bond requirement), which would be repaid through ratepayer revenues in the early years of the program. In addition, SVCCEP external sources of financing for working capital and initial electricity contracts may require some form of loan guarantee from one or more municipal partners until program revenue is received and credit guarantee provisions can be released.[2] The amount of capital needed will depend mostly on initial customer load projections since 80-90% of program costs are likely to be related to energy purchases.

Assuming continued favorable prices for electricity in California markets, and continued increases in PG&E electricity rates, SVCCEP can expect to offer a greener energy supply to its customers at competitive, potentially lower, rates than currently available through PG&E. Rates would depend on the energy portfolio's resource mix, SVCCEP energy program and project development objectives, program

[2] This was the case in both Marin and Sonoma; City and County-backed credit guarantees are no longer required for either program.

management costs and customer retention rates which currently range from 78-89%, in Marin and Sonoma counties respectively.

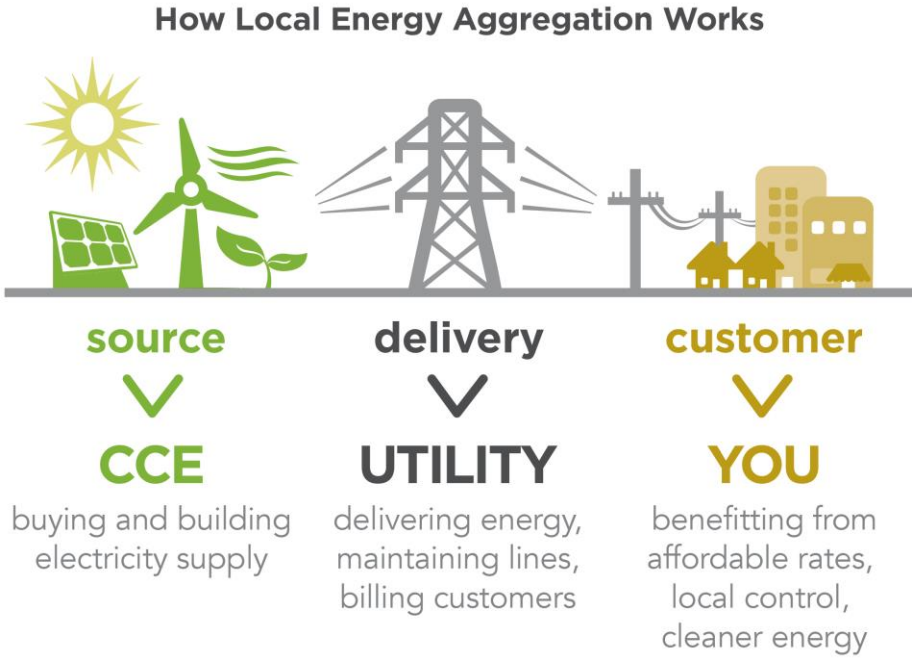
The next step in the CCE investigation process is to perform a technical study that would assess whether program rates can be competitive while achieving environmental policy objectives related to resource mix and program services. The study should consider financial viability at different program sizes and power portfolios with the understanding that all residential, municipal and commercial/industrial customers in the jurisdiction must eventually be offered service, and considering that the region has significant industrial and commercial load.

I. Introduction

Community Choice Energy (CCE) enables city and county governments and some special districts to pool the electricity demand within their municipal territor(ies) for the purpose of procuring or generating electrical power and providing related energy services.[3] CCE was established under California state law in 2002 with the passage of AB 117 and was later amended by SB 790 in 2011. Officially referred to in the legislation as Community Choice Aggregation (CCA), CCE programs allow local governments to take control of electrical generation revenues and determine the source of their power supply, with the idea of procuring a cleaner mix of power than is otherwise available. Under this model, the power transmission, delivery and customer billing remains with the incumbent utility, but the selection of generation sources and the provision of related energy services are decided by the CCE on behalf of the community. CCE programs are distinct from municipal utilities, such as Silicon Valley Power in the City of Santa Clara, which own the distribution infrastructure much like an investor-owned utility except that they are publicly held. CCE offers a "hybrid" approach that forms a structural partnership between the community (through CCE) and the incumbent utility, Pacific Gas & Electric Co. In this way, CCE programs provide customers with an alternative energy choice that is not otherwise available within California's traditional utility structure.

Figure 1 below is a basic illustration that shows how CCE works in California and the relationship between the CCE, utility and customer. It should be noted that customers experience *no difference* in their energy delivery or billing process. The lights still turn on, hot or cold air comes through the vents, their monthly bill still comes from PG&E, and they still call PG&E in the event of a power outage or other "pole and wire" issue. The real difference is in the type of power that is being put on the grid on their behalf and the potential for rate savings and other local benefits that CCEs deliver.

Figure 1: CCE Delivery Model



[3] Please see Appendix 1 for a Glossary of Terms used throughout this report and Appendix 2 for a basic FAQ about CCE and how it works.

The process and timeline for developing a CCE program varies depending on the municipality's budget, objectives, political environment, and selected approach but the common and statutorily required elements include:

- **Technical Feasibility Study** - Recommended to provide quantitative information about the community load profile, customer base and program size, power supply scenarios, and financial analytics.
- **CCA Ordinance** – Passage of a local ordinance is statutorily required to authorize customer enrollment at the city, county and/or special district level. While a County may develop and administer a CCE program on behalf of its cities (or vice versa), each jurisdiction is required to pass an ordinance in order to participate in a CCE program.
- **Implementation Plan** – A statutorily required CCE program plan that must be filed and certified by the CPUC prior to service commencement.
- **Utility Service Agreement** – Required agreement, filed with the CPUC, between the CCE program and the utility that governs the functional relationship between the two entities.
- **Administering Entity** – A legally authorized organization or agency that will handle the daily operations of the CCE program on behalf of its participating municipalities.
- **Customer Enrollment** –The state of CA requires a minimum customer enrollment/notification period of 120 days (60 days prior and 60 days post launch) and the ability to opt-out of the program at any time.

There are, of course, many other details and steps in the CCE formation process, but these cover the primary start-up elements.

Per the statutory provisions of AB 117, CCE is an opt-out program, meaning that once local ordinances are passed and the CCE program is ready to launch, customers are automatically enrolled in the program over a period of several months. Thus, similar to a local water or sewerage agency as the default provider of those municipal services, the CCE becomes the default provider of the community's electrical generation services, while the incumbent utility remains the default provider of electrical transmission and distribution services. Opt-out aggregation is common across the country as it achieves the necessary market scale for effective group purchasing and long-term power procurement. It should be noted, however, that all customers are given ample opportunity to opt-out and can do so at any time.[4] Customers always have the choice to remain with the CCE program for electric generation and other community energy services or return to full bundled service provided by PG&E.

CCE programs can and are choosing to procure and develop cleaner sources of electricity than is otherwise available through the incumbent utility. CCEs are also providing energy-related services such as energy efficiency retrofits, on-line energy usage monitoring, community EV charging stations, energy battery storage and other programs that meet community goals related to energy, climate action, local economic development, price stability and local control.

[4] State law requires that customers receive at least four opt-out notices from the CCE agency providing instructions for how customers can opt-out of the program. Two notices should be sent 60 days prior to launch, with two more within 2 billing cycles or 60 days after launch. This is the window of time when customers can opt-out for free, either by phone, letter or online. After that period, there may be a small fee to switch back to the utility.

Communities in California have been motivated to establish CCE programs for three primary reasons: (1) to reduce greenhouse gases and accelerate the use of renewable energy resources; (2) to procure electricity for a lower price; and (3) to bring new revenue sources into the local economy. Marin County started the State's first CCE program, MCE, in 2010 and has purchased electricity on the open market and contracted for its own solar, wind and biogas power generation. Sonoma's program, SCP, launched in May of 2014 and is emphasizing local renewable energy, including a 100% clean power option sourced from Sonoma's geothermal power facility. MCE also recently started offering a 100% local solar option sourced from a new community solar project in the northern part of Marin County.

With the exception of the City of Lancaster, which is launching in May 2015 under an Enterprise Fund structure, these CCE programs have been established at the county level and governed by a Joint Powers Authority (JPA), which is the recommended legal structure for a multi-jurisdictional public agency approach. There are also some emerging private-sector models that are offering CCE managed service on a fee basis. Either way, municipalities have flexibility to form as they wish - with a city or county in the lead, with single or multiple jurisdictions across a single or multiple counties - as long as there is a qualified, legally authorized administrative entity that will run the daily operations of the program and allow for public governance and community participation.

CCE programs have been able to offer a number of benefits for local governments in California:

- ***Local Control**:* CCE gives communities control over the source of their electricity and how their electricity dollars are spent. Under current practice, CCE agencies are non-profit, public institutions governed by a Board of Directors consisting of local officials from participating jurisdictions. Through this public governance structure, communities have a say in the program's goals, operations, rates and procurement policies. Revenues can be reinvested into the community through targeted investments in clean technology, energy efficiency, energy related jobs training, or renewable energy development, as has been the case in Marin and Sonoma.
- ***Local Economic Development Benefits**:* CCE programs are funded by electric generation revenues based on locally set rates that are redirected from the utility and flow into the local CCE agency. This results in new revenues to the local economy, benefitting consumers, municipal operations and local businesses that may wish to offer contract services to the CCE agency. These revenues can be leveraged by the agency's ability to: (a) issue bonds for local power projects; (b) apply for State and CPUC funding to develop new energy efficiency programs; and (c) create public-private partnerships with local companies providing innovative energy related programs and services. Because Community Choice agencies can finance projects with tax-exempt bonds and do not have to pay dividends to shareholders, financing and delivery costs for these efforts are often lower than for-profit utilities. The revenues and profits from a local power development project would stay within the local community instead of flowing out to utility shareholders. And once all the power and operations requirements are met, the community decides how to use excess revenue for local energy related programs and investments.
- ***Environmental Benefits**:* CCE programs can reduce greenhouse gas (GHG) emissions associated with electricity consumption by offering a resource mix to customers that is both higher in renewable power content and lower in carbon intensity than what the investor-owned utilities (IOUs) offer. For example, Marin's CCE program has a carbon intensity (as measured in lbs. of CO2 per megawatt-hour) of about 15% below Pacific Gas and Electric (PG&E). Sonoma's carbon intensity is 33% less

than PG&E. Many municipal climate action plans have stressed that a major source of GHGs is from fossil fuel combustion in power plants that serve the area's population.[5] Many of these plans have noted that participation in a CCE program would be the most impactful action a city could take to lower greenhouse gasses and reduce its carbon footprint.[6]

- ***New Local Energy Programs**:* CCE programs can implement locally-tailored energy initiatives that are difficult to achieve at the macro utility level. For example, the CCE can offer energy efficiency and demand response programs that meet specific community goals. In Marin for example, their initial energy efficiency initiative targeted multi-family dwellings and MCE partnered with the Marin City Community Development Corporation to train local residents to perform energy efficiency audits for those projects. CCE can also incentivize local renewable electricity generation through net-metering and feed-in tariff programs, along with other ways of aggregating, sharing, and financing of new energy sources. For example, MCE and SCP have policies that pay net-metering customers for excess power at higher rates and at better terms than PG&E's net metering program[7] – thereby encouraging greater investment and participation in rooftop solar. Likewise, both MCE and SCP's feed-in tariff programs have better pricing than PG&E, and guarantee a long-term, fixed and secure price for local power projects, making it much easier for project developers to finance new local renewable generation within the CCE service territory.
- ***Rate Stability and Lower Prices**:* By focusing on demand reduction and the deployment of locally-owned renewable resources within the construct of a long-term, balanced supply portfolio, CCE potentially offers the advantage of greater rate stability. The on-going decline in renewable power prices can also translate into *lower* rates over the long term. For example, Sonoma County conducted an exhaustive study of the rate impacts of different amounts of local renewable energy development. The scenarios that developed renewable projects *within* the county led to the lowest rates by 2020 compared to PG&E.[8] In addition to locally-owned resources leading to lower costs, CCE programs to date have tended to change their rates only once per year, whereas the incumbent utilities may change them multiple times (usually upwards) in a year. In 2014 alone, PG&E raised their average electric generation rates several times, resulting in a 12% increase for the year across all customer classes.
- ***Consumer Choice***: At the most fundamental level, CCE is about giving consumers energy choice they don't otherwise have. Under the current system, consumers can only buy power from a single, investor-owned company, in our case PG&E. CCE fosters competition, with all its affiliated benefits, by offering an alternative to consumers. This dynamic can encourage beneficial cost efficiencies and policy changes by utilities that have not otherwise faced a competitive market.

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[5] AB 32 is the state's law that requires large emitters of greenhouse gases to reduce their emissions. Recognizing the important role local governments play in the implementation of AB 32, plans set up by the Air Resources Board have called for local governments to set municipal and communitywide GHG reduction targets to coincide with the statewide limit.

[6] As discussed in Section 5 there is some controversy around GHG accounting because there are different measurement methodologies and no single, standard GHG accounting practice. This issue impacts all CA 'load serving entities' including CCEs and is currently under discussion at the California Public Utilities Commission.

[7] More explanation of net metering is provided on p. 23.

[8] *Report on the Feasibility of Community Choice Aggregation in Sonoma County.* Published by the Sonoma County Water Agency, County of Sonoma General Services, Dalessi Management Consulting and MRW & Associates. This report can be found at https://sonomacleanpower.org/wp-content/uploads/2015/01/CCA-Feasibility-Report-2011-10.pdf

II. Experience of Marin and Sonoma County CCE Programs to Date

MCE and SCP are California's first CCEs, launched in 2010 and 2014 respectively, with some operational history to draw from. The City of Lancaster in southern CA is in early launch phase, currently enrolling Phase I municipal accounts. As described in further detail below, both MCE and SCP have been successful in achieving the three primary goals of CCE in California: 1) increased greenhouse gas reductions, 2) cleaner power supply, and 3) competitive (currently lower) rates than the incumbent utility. Both organizations have high customer satisfaction rates, healthy balance sheets, and sound management practices under a joint powers agency (JPA) structure. MCE has developed energy efficiency and other related energy programs such as local EV charging stations and commercial battery storage, and both programs have made substantial investments in new local and regional renewable power projects.

Of particular interest among communities investigating CCE is financial performance. MCE and SCP have so far been very fiscally sound. Both agencies have taken deliberate, conservative approaches to long-term financial management, establishing procurement strategies, reserves and cash flow with stable, competitive rates, even through periods of program expansion. Please see Appendices 4 and 5 for copies of each organization's 2015/2016 operating budgets.

MCE's total revenues for fiscal year 2014-15 are expected to be just under $100 million with reserves of about $2 million. About $90 million of total revenues support electricity purchases and related fees. MCE will have spent about $2.7 million this fiscal year on energy efficiency and other renewable energy programs. Notably, MCE expects a 50% increase in revenues in their 2015/2016 budget, mostly related to expansion into new communities in Napa and Contra Costa counties.

SCP's current fiscal year revenues are expected to be about $103 million with reserves of just under $9 million. Of this, about $84 million is allocated to the costs of electricity and related fees. SCP reports that it repaid its initial $1.6 M in start-up costs (provided by the Sonoma County Water Agency) in the first three months of operation, transferring debt obligations to a working capital loan provided by Community Bank of Sonoma. SCP has not so far invested in energy efficiency or ancillary energy programs although it expects to do so beginning later this year. SCP's operating expenses are higher than MCE's because of its (currently) higher cost of debt service. However, it expects its revenues to increase about 60% in the next full fiscal year and for its reserves to double as a result.

Another key element is the ability of CCE programs to be rate competitive with the incumbent utility which both MCE and SCP are, currently offering rates below that of PG&E for their default products (Light Green and Clean Start). The following table shows MCE and SCP's current electric generation rates in the most common customer classes as compared to PG&E electric generation rates in similar customer classes.

Table 1: PG&E, CCE Electric Generation Rate Comparison ($)

Generation Rate	PG&E	MCE/Light Green	MCE Deep Green
E-1 (residential)	0.09745	0.079	0.089
A-1 (small commercial)	0.1015	0.0791	0.0891
E-19 (large industrial)	0.0992	0.0766	0.0866
AG-1 (agricultural)	0.1026	0.0895	0.0995
	PG&E	**SCP/Clean Start**	**SCP/Evergreen**
E-1 (residential)	0.09745	0.071	0.106
A-1 (small commercial)	0.1023	0.0762	0.1112
E-19 (large industrial)	0.1016	0.0767	0.1117
AG-1 (agricultural)	0.1075	0.0808	0.1158

Source: http://www.pge.com/en/myhome/customerservice/energychoice/communitychoiceaggregation/index.page

II-a Marin Clean Energy (MCE)

MCE started service delivery in 2010 and currently has 140,000 accounts serving all of Marin County the City of Richmond and unincorporated Napa County. The cities of San Pablo, El Cerrito, and Benicia have also joined MCE and are currently in the process of customer notification and enrollment. By the end of 2015, MCE projects a customer base of ~165,000 accounts. Marin Clean Energy currently offers its customers three power supply options and other energy-related services which will be discussed later in this report:

1) **Light Green:** Default product; 50% renewable power currently offered at lower rates than PG&E
2) **Deep Green:** Voluntary "opt-up" product; 100% renewable power @ .01 cents/kwh monthly premium (~$5.00/month for an average size house)
3) **Local Sol:** Voluntary "opt-up" participation in local community solar program; 100% renewable solar project in Marin County; limited to 200 customers at a set rate for 20 years; monthly premium cost at ~ $18.00/household.

MCE Resource Mix*:* MCE has power contracts from 17 different energy suppliers, including its first and largest energy provider, Shell Energy North America (SENA). Through these contracts, MCE has a current renewable energy content of 51% in its default/light green product, and customers can voluntarily opt-up to 100% renewable for a one cent/kWh premium in its deep green product. As noted earlier, MCE also recently launched its local Sol-Shares program, sourced from a community solar project in Novato, which is offered at a significantly higher monthly premium at a set cost over twenty years. As stated in its updated Implementation Plan (2014), MCE also plans to reduce its purchases of natural gas and significantly increase its purchase of renewables through 2020. It is not specified how the share of renewables will increase to this degree, but MCE is investing in a number of renewable energy projects throughout the State of CA and locally, recently reporting 195 MW of new, California based renewable power under development for its customers. The diagram below shows MCE's 2013 resource mix, which is included in its most recent Implementation Plan. About 39% of the portfolio is

system power (predominantly natural gas), 10% large hydro, and 51% qualified renewable, of which 33% is supported by wind RECs (renewable energy credits).[9]

Table 2: PG&E/ MCE Power Resource Mix

2013 Electric Power Generation Mix*

	Percent of Total Retail Sales (kWh)		
Specific Purchases	**PG&E**	**MCE Light Green**	**MCE Deep Green**
Renewable	**22%**	**51%**	**100%**
• Biomass & Biowaste	4%	6%	0%
• Geothermal	5%	0%	0%
• Eligible hydroelectric	2%	12%	0%
• Solar electric	5%	<1%	0%
• Wind	6%	33%	100%
Coal	**0%**	**0%**	**0%**
Large hydroelectric	**10%**	**10%**	**0%**
Natural gas	**28%**	**0%**	**0%**
Nuclear	**22%**	**0%**	**0%**
Other	**0%**	**0%**	**0%**
Unspecified sources of power	**18%**	**39%**	**0%**
Total	**100%**	**100%**	**100%**

* 2013 data is from the "Annual Report to the California Energy Commission: Power Source Disclosure Program". PG&E data is subject to an independent audit and verification that will not be completed until October 1, 2014.

2012 Total CO_2 Emissions from Electricity Sales per Megawatt-Hour**

PG&E	MCE Light Green	MCE Deep Green
445 pounds	380 pounds	0 pounds

** The CO_2 emission rates reflect the emissions associated with PG&E's and MCE's respective energy supplies in 2012. For the purpose of this chart, renewable energy, hydroelectric and nuclear resources have been considered GHG free.

Source: Pacific Gas and Electric:
http://www.pge.com/en/myhome/customerservice/energychoice/communitychoiceaggregation/index.page

Rate Competitiveness: Given the complexity of PG&E's rate structures, especially for commercial and industrial customers, comparing a utility's rates to a CCE's rates is not always a straightforward, apples-to-apples comparison. However, when MCE initiated service in 2010, it designed its rate structure to be virtually identical to PG&E's to promote transparency in cost comparisons and minimize surprising changes for customers. Sonoma's rate structure followed suit.

Shortly after MCE's launch, in a competitive move designed to undermine MCE's early success, PG&E shifted costs from generation to transmission and distribution and lowered most of its generation rates; thus for about a year, MCE's rates were slightly higher than PG&E's.[10] Over the last three years, however, MCE's rates have been on average 3-7 % cheaper in all rate classes. The chart below compares the most recent rates for typical commercial and residential customers in MCE's service territory. The chart shows that for commercial customers, the pricing for both MCE's 50% and 100% renewable options is less than PG&E (inclusive of PCIA/exit fees[11]) while MCE's 100% local solar program is substantially more expensive. In the residential sector, only MCE's 50% default product is cheaper than PG&E, but it is important to note that PG&E's power mix is substantially less than 50% renewable

[9] For more information on RECs, please see Appendix 2 for a high level briefing on what they are and how they work.
[10] Please note that while utility cost shifting remains a concern, similar tactics have not been permitted by the CPUC since that time.
[11] Power Charge Indifference Adjustment (PCIA) is an "exit fee" based on stranded costs of utility generation set by the California Public Utilities Commission and paid to the utility. It is calculated annually and assessed to customers who take service from an electric generation provider (e.g. CCE) other than the incumbent utility.

energy; in 2014, PG&E's projected renewable energy mix is 27%. It should also be noted that MCE's 50% product is supported by a significant portion of unbundled renewable energy credits (RECs). These RECS were purchased under the Green-e certification program in addition to the bundled renewable power procured to meet the State's 2020 RPS standard of 33%, six years ahead of schedule.

Table 3: MCE 2015 Residential & Commercial Rates

E-1 Residential (assume 500 kwh/month) (2015 rates)				
	PG&E Standard Rate 27% Renewable*	**MCE Light Green 50% Renewable**	**MCE Deep Green 100% Renewable**	**MCE Local Sol (100% Local Solar)**
Generation	$49.50	$40.13	$45.21	$72.14
Delivery	$44.37	$44.37	$44.37	$44.37
PCIA exit fees	NA	$6.27	$6.27	$6.27
Total	**$93.87**	**$90.77**	**$95.85**	**$122.78**
A-1 Small Commercial (assume 1,405 kwh/month) (2015 rates)				
Generation	$142.54	$111.00	$125.05	$199.51
Delivery	$154.70	$154.70	$154.70	$154.70
PCIA exit fees	NA	$15.45	$15.45	$15.45
Total	**$297.24**	**$281.15**	**$295.20**	**$369.66**

** Projected 2014/2015 renewable content* *Source: Marin Clean Energy, March 2015*

Energy requirements and Renewable Energy Credits: Provided below are the estimated energy requirements for MCE's service territory in GWh through 2023. This is helpful to see total energy needs and how they are being filled. MCE relies much more on unbundled RECs than Sonoma Clean Power, an issue that has drawn some criticism in recent years. In 2014, for example, of the 1,356 total GWh demand of all MCE customers, voluntary RECs under contract total 320 GWh or about 24% of total supply. Voluntary REC purchases[12] will remain fairly constant throughout the planning period even though demand will reach more than 1,700 GWH with additional customers enrolling in the program. In 2016, for example, RECs will go down to 18%.

[12] California requires all load-serving entities, including CCE programs, to obtain a minimum portion of their power from renewable resources (known as the Renewable Portfolio Standard or RPS, which will hit 33% by 2020). A certain percentage of that renewable power may be obtained from unbundled RECs. Voluntary RECs are those that are not used for RPS compliance or are purchased above and beyond RPS compliance requirements (eg: for MCE's 100% renewable option).

Table 4: MCE's Current and Projected Energy Requirements

All in GWH	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Energy Needs	1356	1675	1714	1709	1703	1698	1692	1687	1682	1677
Total Energy Under Contract	1215	1387	1488	1560	589	373	378	383	383	383
Net Open, all physical energy	141	278	226	149	1114	1325	1314	1304	1299	1293
Conventional Energy Requirements	1021	1240	1257	1220	1220	1219	1218	1214	1211	1207
Conventional Resources Under Contract	977	984	971	945	25	25	25	25	25	25
Open Position, Conventional	44	256	286	275	1195	1194	1193	1189	1186	1182
RPS requirements	371	490	517	532	530	529	527	525	524	522
Voluntary REC requirements	288	326	319	303	304	304	311	312	313	313
RPS Resources Under Contract	349	516	517	615	564	348	353	358	358	358
Voluntary RECs Under Contract	320	107	-	-	-	-	-	-	-	-
Open Position, Renewable Energy	(10)	192	319	220	270	485	485	479	478	477

Source: MCE 2014 Implementation Plan

RECs have become a complicated policy issue for CCEs in California and their use has garnered a good deal of criticism for MCE in recent years. SCP learned from that and made a policy decision to procure a power portfolio with a lower renewable energy content (33% vs. 50%) but in so doing, limited the use of unbundled RECs to only 3% vs. ~24% in MCE's portfolio. A more detailed discussion of RECS is included in Appendix 3, but it is useful to make a few key points on the topic:

1) RECs are a market-based tool created in the 1990s and sanctioned by the US Environmental Protection Agency to support the development of new renewable power resources in the US and to provide a tracking method for clean power production and compliance.
2) There is one REC generated for every 1 MWh of clean power produced, and it is the REC that legally confers the environmental attributes associated with that unit of clean power.
3) A REC may remain with the unit of clean power (a bundled REC) or it can be separated from the source and sold separately in the marketplace (an unbundled REC). Regardless, it is the REC that confers the environmental benefits of that power.
4) RECs are intended to be retired after the owner claims its environmental attributes for state compliance.
5) Unbundled RECs receive 100% compliance credit in some states, but in California, they receive declining credit and are being phased out over time.

"Unbundled" RECs have presented some controversy among environmental and consumer groups because, as noted in bullet 3, the buyer does not actually take delivery of the associated clean power and there is some question about whether the RECs actually stimulate new investment in renewable projects or are simply "green gravy." In addition, some feel that the use of unbundled RECs is a form of greenwashing because it is the REC that confers the green power attribute, even if it is purchased to "green up" an otherwise fossil- based power portfolio.

It must be said that RECs are a common, legal and recognized energy commodity (similar to carbon offsets) that confer environmental attributes at a fraction of the cost of bundled clean power. Thus, RECs can add value to a portfolio while also allowing the utility, CCE or other load serving entity to remain price competitive. However, their use within the overall power portfolio is a policy decision best left to CCE leadership and its procurement and regulatory compliance experts. Finally, not all REC's are created equal and MCE has taken the wise step of purchasing only Green-e certified RECs that come with more stringent requirements and closer tracking methodologies.[13]

II-b Sonoma Clean Power (SCP)

Sonoma Clean Power
Local. Renewable. Ours.

SCP started service in May 2014, with phase I serving 22,000 commercial accounts within its unincorporated County and five-city service territory. In late 2014, SCP expanded service to the full County and currently serves more than 200,000 customers, representing about 90% of the total customer base in the County. SCP currently offers its customers two power supply options:

1) **Clean Start:** Default product; 33% renewable power currently offered at lower rates than PG&E
2) **Evergreen**: Voluntary "opt-up" product; 100% renewable power, offered at a premium and sourced locally from the geysers geothermal facility.

SCP's primary energy services provider is Constellation Energy. For the default Clean Start product, about 37% is sourced from large hydropower (which is low carbon but not considered a renewable resource under State RPS guidelines) and 30% from system power. When compared to MCE's mix, SCP has a much greater percentage of large hydro, but less system power, which is primarily natural gas. SCP's overall carbon footprint is therefore lower than both PGE and MCE. Over the long-term, however, this resource mix could make SCP (like PG&E) more vulnerable to drought conditions than MCE. It is a risk that the agency is currently mitigating through its long-term power resource planning and procurement.

[13] Center for Resource Solutions/Green-e: http://www.resource-solutions.org/progs_greene.html

Table 5: PG&E/ SCP Power Resource Mix

Electric Power Generation Mix*

Specific Purchases	Percent of Total Retail Sales (kWh)		
	PG&E	Sonoma Clean Power	
		CleanStart	EverGreen
Renewable	22%	33%	100%
• Biomass & Biowaste	4%	9%	0%
• Geothermal	5%	15%	100%
• Eligible hydroelectric	2%	0%	0%
• Solar electric	5%	0%	0%
• Wind	6%	9%	0%
Coal	0%	0%	0%
Large hydroelectric	10%	37%	0%
Natural gas	28%	0%	0%
Nuclear	22%	0%	0%
Other	0%	0%	0%
Unspecified sources of power	18%	30%	0%
Total	100%	100%	100%

* PG&E's generation data represents 2013 is provided in the "Annual Report to the California Energy Commission: Power Source Disclosure Program." SCP's generation data is forecast for 2014.

Total CO_2 Emissions from Electricity Sales per Megawatt-Hour**

PG&E	CleanStart	EverGreen
445 pounds	294 pounds	70 pounds

** The CO_2 emission rates reflect the energy generation provided by PG&E in 2012. SCP's CO_2 emission data is forecast for 2014.

Source: Pacific Gas and Electric:
http://www.pge.com/en/myhome/customerservice/energychoice/communitychoiceaggregation/index.page

SCP was able to focus on local and regional renewable project procurement much earlier than MCE, with more than 80 MW of solar in the pipeline, including a 12.5 MW project that will be built on the property of the County Water Agency, specifically "floatovoltaics," comprised of solar panels atop floating docks in the water agency's irrigation pond. It also made a decision to procure its 100% Evergreen product locally, purchasing bundled geothermal power from Calpine, which has an existing generation facility located in the County. MCE also emphasized local projects in recent years with 200 MW+ in the pipeline, including solar, wind and landfill gas. But at its inception, MCE relied heavily on its energy services provider, Shell Energy North America, to provide its renewable resources focusing more on getting started and building a viable agency at the outset.

Like MCE, SCP has been less expensive than PG&E in its rates, saving customers more than $6 million in its first seven months of operation in 2014. Provided below is SCP's 2015 rate comparison; the results are similar to the MCE/PG&E comparison, but with slightly greater rate savings due to the more favorable pricing they received when they went to market for their initial energy contracts.

As noted previously, while SCP's resource mix has a lower renewable content than MCE, it also uses far fewer unbundled RECs, which was a conscious policy choice in the face of the controversy about RECs that started in 2013. In addition, SCP does *not* count unbundled RECs in its reduction calculations for greenhouse gas emissions. Attributing GHG benefits to unbundled RECs has recently become an issue at the CPUC, and it is possible that any standardized methodology developed for calculating GHG emissions

will follow the approach taken by SCP. This remains to be seen, however, since the issue goes far beyond CCEs in terms of the use of unbundled RECs and the GHG calculation methodologies for compliance.

Table 6: SCP 2015 Residential & Commercial Rates

E-1 Residential (assume 500 kwh/month) (2015 rates)			
	PG&E Standard Rate 27% Renewable*	**SCP Clean Start: 33% Renewable**	**SCP Evergreen: 100% Local Geothermal**
Generation	$48.73	$35.50	$53.00
Delivery	$58.85	$58.85	$58.85
PCIA exit fees	NA	$6.17	$6.17
Total	**$107.57**	**$100.52**	**$118.02**
A-1 Commercial (assume 1,500 kwh/month) (2015 rates)			
Generation	$153.42	$114.24	$166.74
Delivery	$165.75	$165.75	$165.75
PCIA exit fees	NA	$16.50	$16.50
Total	**$319.17**	**$296.49**	**$348.99**

** Projected 2014/2015 renewable content* *Source: Sonoma Clean Power*

Finally, SCP had the benefit of learning from Marin's experience, which according to SCP's Director, helped shape some of SCP's strategy, including the following:

- SCP was sensitive to the potential perception that customers may feel they were being forced into a "government energy program" and therefore tried different messaging. For example, opt-out notices were called "enrollment notices" and SCP always stated that it was working hard to "have the right to be people's default provider." People weren't being forced into any particular program – only the "default provider" was changing.
- Outreach was extensive and constant. More than 100 public meetings took place during the formation process, and radio and newspaper advertisements were plentiful during the six months prior to launch. Such outreach can be labor intensive and expensive, but necessary.
- SCP maintained a positive relationship with PG&E. This was helped a great deal by the passage of SB 790 in 2011, which prohibits investor-owned utilities from marketing or lobbying against CCE programs.
- Sonoma also included IBEW 1245, the labor union representing PG&E line workers, on its CCE Steering Committee during formation, and SCP experienced very limited political opposition from the unions before launch.
- Both MCE and SCP make a point not to overpromise on rates. They understand that their CCE default rates may not always be cheaper than PG&E. Thus, both organizations have an established policy to provide *competitive* rates and there are reserve policies in place to support that objective.

The following is a chart that shows a summary level comparison of key program elements between Marin and Sonoma programs:

Table 7: MCE and SCP Comparative Analysis

	MCE	SCP	Notes
Number of Accounts **Number of Staff Members**	~140,000 25	~ 200,000 9	MCE's accounts are projected to jump to 165,000 by end of 2015
Administrative Structure/Board Composition	JPA; One elected-official appointed to the Board from each participating jurisdiction	Same as MCE, although JPA agreement does not require that all appointed Board members must be elected officials	All meetings subject to Brown Act
Voting	Two tier system; first tier = one member, one vote; second tier = weighted voting based on load size	Same as MCE	Second tier voting has never been invoked by either MCE or SCP
Service Territory	Marin County plus the Cities of Richmond, Benicia, San Pablo, El Cerrito, and unincorporated Napa County	County of Sonoma	MCE will allow for further expansion at end of 2015; SCP plans unknown
Citizen's Advisory Committees	No; Subcommittees of the Board – Executive and Technical Committees plus periodic ad- hoc committees	Yes; citizens may apply to serve on Operations Committee and/or Ratepayer Advisory Committee	Advisory to Board
2015-16 Projected Revenues; **Percent dedicated to program administration**	$145,933,097 4%	$165,495,000 3.5%	MCE's and SCP's budgets will be expanding substantially with addition of new customers/communities
Power Supply Options	Light Green @ 50% RE Deep Green @ 100% RE Local Sol @ 100% local RE	Clean Start @33% RE Evergreen @ 100% local RE	
Unbundled RECs?	Yes; ~24% unbundled RECs	Yes; 3% unbundled RECs	
Average Customer Rate Savings	1-3% (residential) 3-7% (commercial)	6-9% (residential, small commercial) 9-14% (low-income and large commercial)	
Opt-Out Rate	~ 23%	~ 10-11%	
MWs of new RE under contract	235 MW	82.5 MW	Most of these contracts are for in-state and local solar projects
NEM and FIT programs?	Yes	Yes	
NEM and FIT programs?	Yes; MCE is a designated EE program administrator registered with the CPUC	No; referring to existing County/PG&E programs	

III. Emerging CCE Programs Around the State

As of April 2015, at least 20 counties and/or hundreds of cities within them are currently investigating or actively pursuing CCE formation. Similar to the SVCCEP, most of these communities are leading with greenhouse gas reduction and the shift to renewable power as the primary objectives, but there is growing interest in the central valley, which tends to have a greater focus on cost savings and other economic development benefits.

Figure 2: CCE Program Development Status (as of April 2015)

The following is an update on the City of Lancaster, currently in Phase I customer enrollment, and a few of the cities and counties that have recently committed significant resources to CCE Phase I "due-diligence and pre-planning."

City of Lancaster: The City of Lancaster's program, Lancaster Choice Energy, is a single jurisdiction CCE run through an Enterprise Fund model by the City of Lancaster. The program is currently enrolling ~680 municipal accounts and 200 non-municipal early enrollees and expects to begin Phase 2 enrollment of 5,300 commercial and 50,000 residential accounts in October 2015, ultimately serving 55,000 customers citywide. The City has contracted with Direct Energy Services for its initial power contract and scheduling services, and is offering a default power product called "Clear Choice" with a 35% renewable power content. LCE is also offering its voluntary "Smart Choice" product with a 100% renewable power

content at a small premium. Default rates were set at 3% lower than the incumbent utility, Southern California Edison. For more information on Lancaster's CCE program, please see www.lancasterchoiceenergy.com.

Alameda County: In June, 2014, the Board of Supervisors allocated $1.3 million to investigate and possibly form a countywide CCE program.[14] The County has requested PG&E load data for the unincorporated areas and all 13 cities, and their Steering Committee and technical study will soon be underway. The County's projected launch date is Q1 2017. For more information on Alameda County's program, please see: www.acgov.org/cda/planning/cca

San Mateo County: In February 2015, the County Board of Supervisors voted unanimously to move ahead with Phase I of their CCE investigation, allocating $300,000 for Phase I within a total project budget of $1.5 million. PG&E load data has been requested on behalf of the County and all 19 of its cities, and the County CCE advisory committee and technical study will soon be underway. The County's projected launch date is Q3 or Q4 2016. For more information on San Mateo County's program, please see: www.smcgov.org/community-choice-aggregation

Monterey Bay: Led by the County of Santa Cruz with Monterey and San Benito Counties as partners, this tri-county CCE initiative has the support of three counties and 21 cities participating in their technical study. As of January 2015, the County had raised nearly $400,000 in state grants[15] and private funds to support their Phase I due-diligence and early outreach. The program is guided by the County and a planning development advisory committee (PDAC) of local government representatives and stakeholders. For more information on Monterey Bay's efforts, see www.montereybaycca.org

Los Angeles County: On March 17, 2015 the LA County Board of Supervisors unanimously voted to allocate funding for a Countywide CCE study that would include many of the cities in the South Bay Council of Governments service area. Of those cities, eight have already have passed resolutions of support including the cities of Carson, Torrance, Redondo Beach, Hermosa Beach, Manhattan Beach, Palos Verdes, Beverly Hills, and Santa Monica. For more information about these efforts, please see: www.southbaycleanpower.org.

The City of San Luis Obispo and Mendocino County also recently passed resolutions authorizing the investigation of CCA and requesting that staff research various models/options under which a program could operate.

[14] Alameda County's $1.3 M allocation is for Phase I CCE planning and due diligence within an overall start-up budget of $3.4M. Although some county staff time is covered under this budget and community engagement/marketing costs will be high for a County of this size and diversity, it is possible that the start-up costs could be lower than projected.

[15] From the California Strategic Growth Council

IV. CCE Energy Program Development: Energy Efficiency, Local Renewables and Other Innovative Efforts

Energy Efficiency (EE): An additional service opportunity for CCEs is the integration of local energy efficiency programs. How a CCE approaches these programs can complement or replace existing EE options available to their customers, such as those offered by the utility or through state or regional programs. The good news is that there is flexibility and choice for both the CCE and its customers. CCE programs can offer or provide access to energy efficiency programs with a variety of revenue sources including: 1) use CCE revenues collected from customer rates; 2) continue to work with an existing REN (in South Bay, the organization is called BayREN) and access their programs; 3) apply to the CPUC to become an energy efficiency program administrator and receive associated program funds[16]; and 4) apply to the CPUC for a pro-rata share of utility public purpose programming (PPP) funds based on the size of the CCE customer base. In all cases, the CCE's customers still qualify to participate in *statewide* utility-sponsored EE programs.

MCE is the only CCE program with active energy conservation efforts underway in the last few years. SCP has made a decision for now to refer customers to existing energy programs available within Sonoma County.[17] Over the long-term, SCP is likely to follow a model that focuses more on load shifting, enabled by "smart grid" demand response and microgrid activities, than traditional energy efficiency programs. Particularly with the growth of solar power – which can sometimes lead to an excess of energy production during peak daytime hours – SCP leadership feels that load shaping to flatten load curves and reduce peak demand on central utility assets is where its focus should be.

MCE's updated Implementation Plan calls for overall annual energy consumption within its service territory to be reduced by approximately 2% over its planning period through 2023 through energy efficiency efforts.[18] In 2014, MCE's peak demand forecast was 225 MW with annual consumption at 1,289,000 MWh. Two percent of that figure would be 25,780 MWh. For perspective, MCE's saw its 2013 energy efficiency savings come in at just 371 MWh. The goal for 2014 was 1,133 MWh (4.4% of its goal), hitting 1,360 MWh by 2015. As these numbers illustrate, MCE has a long way to go towards hitting its 2% reduction target.

As a non-IOU Energy Efficiency Administrator, MCE has deployed a multi-sector approach to energy efficiency service provision that – prior to 2013 – was only provided by the investor-owned utilities. MCE has elected a phased approach and elected to become an energy efficiency administrator for its customers, receiving an average of $2M annually from the CPUC to support its local programs. MCE offers an interactive web tool to help residential customers identify and take action on energy-saving measures in their homes. MCE also offers a Green Home Loan program that covers the upfront costs of

[16] This is the approach selected by MCE; since 2013, the Agency has been allocated over $5.5M in energy efficiency funding from the CPUC.

[17] For example, Sonoma and many other local jurisdictions have programs whereby energy efficiency upgrades can be financed through payments on property tax bills. These programs are referred to as Property Assessed Clean Energy (PACE).

[18] MCE's Implementation Plan can be found at http://www.mcecleanenergy.org/wp-content/uploads/mce-revised-implementation-plan.pdf. This 2014 document was a revision of MCE's previous 2012 Implementation Plan filed with the CPUC and was developed to reflect changes in MCE's program since 2012, such as expansion to new areas.

energy efficiency improvements. The loan is repaid directly on a customer's PG&E bill (on-bill repayment). For multi-family buildings, MCE provides access to no-cost energy audits, incentives, rebates and property loans to finance projects. MCE offers some free services, such as free walk-through energy assessments for qualifying properties. MCE will also provide tenant units with certain free measures such as exchanging incandescent bulbs with high efficiency lighting, installing high performance faucet aerators and showerheads, and wrapping hot water pipes with insulation at no cost. For commercial customers, MCE offers a similar set of programs, including "Green Business Loans" financed through River City Bank. MCE's website also provides links to a number of other energy-saving programs offered by organizations throughout the Bay Area.[19] MCE is now preparing to expand its EE programs and will be applying to the CPUC to become an energy efficiency administrator for its new communities as new customers are enrolled. MCE has found its phased/incremental approach to program development over time has helped them establish credibility and demonstrate effectiveness to the CPUC. The Agency expects to make larger strides towards its overall 2% reduction goal in the coming few years.

As noted above, CCE programs can also fund energy efficiency programs with their own revenues and reserves. They may also apply to the CPUC for a share of the Public Purpose Programming (PPP) funds[20] collected by the utilities from bundled service customers. This is a complicated area of CPUC regulation, but currently a CCE may qualify for significant program funds if it can demonstrate that it will be able to use the funds cost-effectively and present a plan the Commission believes meets statewide policy objectives and is not already offered by the utility.

Allocation of PPP funding is governed by the CPUC Code Section 381.1. A CCE can elect to become an EE program administrator for its customers and would therefore have access to its share of PPP funding collected from its customers. Or, a CCE can apply to the CPUC to become an EE administrator to serve a broader customer base and apply for an additional allocation of PPP funds beyond its pro-rata share. Section 381.1 of the PUC code further specifies requirements and objectives that must be met in order to be authorized by the CPUC as an EE program administrator.

MCE has qualified for several million dollars in PPP funds to support its own programs, which have focused on multi-family dwelling improvements. Whether a CCE's customers continue to qualify for the utility's programs depends on: 1) the nature of the CCE's funding and programs, and 2) the extent to which their customers are not applying for the same project (i.e. double-dipping) or duplicating utility programs.

Demand Response (DR): Demand response programs offer incentives to customers to reduce their energy requirements (demand) during peak times when power supplies are most expensive.[21] Most DR programs are run by large utilities and require fairly extensive engineering capacities, which many third-

[19] More information on all of these programs is available at www.mcecleanenergy.org.
[20] PPP was previously referred to as the Public Goods Charge -- http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/cpucrole.htm
[21] A utility's load profile changes throughout the day. For example, on summer afternoons, when so many customers use air conditioners, demand for power goes up. This requires utilities to have access to "peaker plants" to satisfy demand only during these relatively few peak times throughout the year. This is expensive and polluting, which is why reducing peak demand has so many benefits.

party companies have. MCE does not yet administer any DR programs, although MCE customers are eligible to participate in PG&E's programs.[22] MCE also receives corresponding "capacity credits" that reduce MCE's need to procure resource adequacy capacity in compliance with CPUC rules. These programs provide 2% of MCE's resource adequacy requirements, and MCE eventually aims to increase this level to 5%, either through MCE or PG&E-administered programs. It has delayed implementation of additional DR programs until it receives better data that will allow it to identify promising projects and strategies.

Net Metering and Feed-In Tariffs: Net energy metering (NEM) provides incentives for customers to generate excess solar energy, beyond their onsite demand. Typically, the incentives from the incumbent utility are set at the wholesale power rate of about 3-4 cents/kWh[23]. This pricing model does not encourage project sizing that would provide additional energy into the utility's grid. To motivate local renewables development, MCE's program pays eligible customer-generators the full *retail* rate normally applicable to the customer's consumption plus an additional 1 cent per kWh incentive for any surplus energy production. This rate is ~ 12 cents/kWh vs. 4 cents/kWh currently paid by PG&E. In MCE's service territory, there are about 4,000 NEM customers, representing approximately 35,243 kW (35.2 MW) of local renewable generation.

On the other side of the meter, project developers that install projects greater than a megawatt can sign a guaranteed power purchase agreement with MCE at a generous rate – more than $100/MWH depending on the size – which is designed to incentivize small-scale, commercial renewable projects. The utilities currently offer about $89/MWH for similar size feed in tariff (FIT) projects.[24] It should be noted that, while newer and thus less robust, Sonoma Clean Power also offers NEM terms that are better than PG&E's and recently established its ProFIT feed in tariff program that looks similar in many respects to MCE's FIT program.

Energy Storage: Energy storage may present cost-savings opportunities for CCE customers. With on-site energy storage, commercial and industrial customers can charge a battery bank during off-peak times and discharge the battery during the peak hours. In so doing, larger customers can reduce their demand charges. Even if a customer hits a very high peak demand for just one hour during a 30-day billing cycle, the customer pays the demand charge at that level. The customer is assessed on a $/maximum kilowatt demand reached (regardless of how many hours the demand was actually at that level). Demand charges represent a large portion of a C&I (commercial and industrial) customers bill, so reducing those few hours of maximum demand by being able to discharge a storage device just during those peak times can lead to substantial savings for customers (see illustration below). This is particularly true with the costs of storage declining and with generous incentives available through the

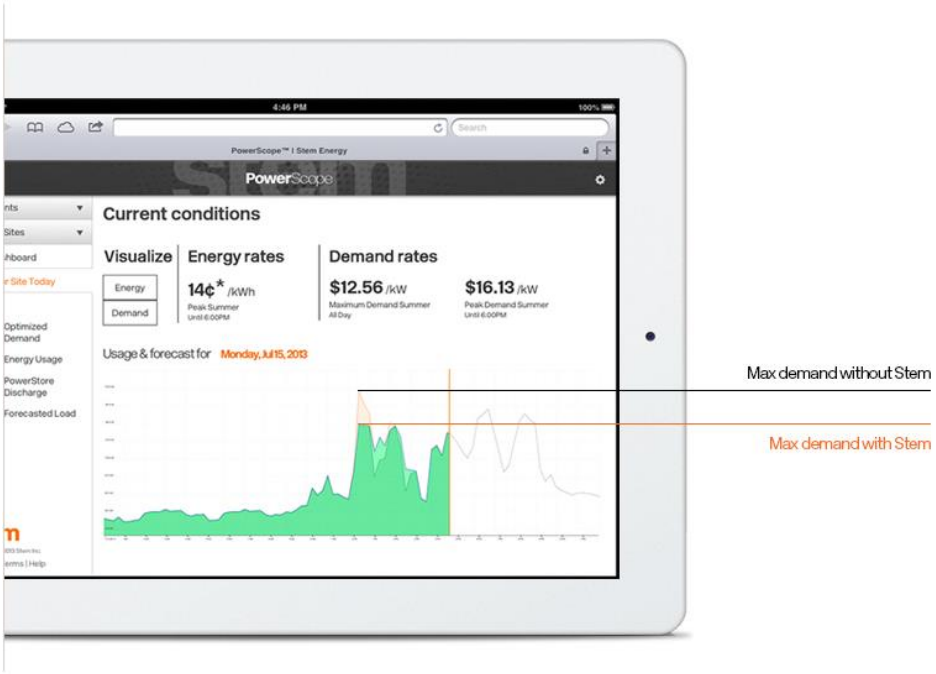
[22] Information on PG&E's energy efficiency programs – including demand response – can be found at http://www.pge.com/myhome/environment/pge/energyefficiency/.

[23] SB 920 authorized payments to be made to NEM customers who generate more electricity than they use over their 12-month billing cycle. The compensation customers receive—known as **Net Surplus Compensation** (NSC)—is based on a 12-month average of the market rate for energy, or roughly $0.03 to $0.04 per kilowatt-hour (kWh). See http://www.pge.com/en/myhome/saveenergymoney/solar/nembill.page?WT.mc_id=Vanity_nem

[24] For more information on feed-in-tariffs, see http://www.pge.com/en/b2b/energysupply/wholesaleelectricsuppliersolicitation/ReMAT/index.page and http://www.cpuc.ca.gov/NR/rdonlyres/0095B424-8E49-4F2A-B1B9-995A0690AB16/0/FITOverview.pdf

State's Self Generation Incentive Program (SGIP).[25] Because demand charges are billed by the incumbent utility as part of transmission and distribution rates, a CCE's energy storage program would not affect CCE revenues. CCE programs could simply refer customers to SGIP or possibly participate in developing projects and generate a revenue stream from that activity.

Figure 3: Benefits of Demand Reduction



Source: http://www.stem.com/for-business

In addition, AB 2514 established energy storage targets for both incumbent utilities and CCEs equal to 1 percent of forecast peak load by 2020. For MCE, that translates to about 3 MW of storage capacity. Beginning on January 1st, 2016, and every two years thereafter, CCEs must file Advice Letters with the CPUC demonstrating progress towards meeting this target, and a description of the methodologies for insuring projects are cost-effective. Storage may be a promising technology for CCE customers, especially those with large commercial and industrial sector loads.

Local Construction of Renewable Energy: One of the key questions regarding an ambitious effort to develop local renewables is whether the resource can scale to meet demand. MCE and SCP face some constraints for large-scale solar PV projects because of the high amount of sensitive park and agricultural land. However, Santa Clara County has a larger potential for solar PV. A March 2012 report, *Bay Area Smart Energy 2020*, estimated the solar PV potential in the Bay Area. It found a potential in

[25] SGIP provides incentives to support existing, new, and emerging distributed energy resources. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. More information on the SGIP program in PG&E service territory can be found at http://www.pge.com/en/mybusiness/save/solar/sgip.page. According to the site, advanced energy storage technologies qualify for a subsidy of $1.46 per watt of storage capacity.

Santa Clara County of more than 4,200 MW for residential and commercial rooftops and commercial parking lots.[26]

Table 8: Bay Area Potential for Solar PV in the Built Environment

County and 2009 Population	Residential (MW_{ac})	Commercial (MW_{ac})	Commercial Parking Lot (MW_{ac})	Total (MW_{ac})
Alameda (1,480,000)	1,360	879	1,525	3,764
Contra Costa (1,036,000)	756	438	1,070	2,264
Marin (249,000)	180	111	260	551
Napa (134,000)	100	78	140	318
San Francisco (810,000)	453	635	835	1,923
San Mateo (714,000)	431	465	735	1,631
Santa Clara (1,771,000)	***1,278***	***1,129***	***1,825***	***4,232***
Solano (411,000)	331	190	425	946
Sonoma (470,000)	375	230	485	1,090
Total	5,264	4,155	7,300	16,719

Source: Bay Area Smart Energy 2020, March 2012

In addition, the US Environmental Protection Agency maintains a database and mapping application as part of its RE-Powering America Program, which encourages renewables development on potentially contaminated land that is not suitable for other development, such as landfills and old industrial sites. In Santa Clara, the database includes sites that have key data needed to pre-screen for solar PV projects, such as total acreage, distance to substation and solar radiation per square meter per day. This database lists sites that total more than 850 MW of potential solar development just in Sunnyvale, Cupertino and Mountain View, including landfills and industrial zones. While not all sites would be suitable or available for development, this database does demonstrate the large solar PV resource that exists.

Cost Implications of Local Build Out: One of the advantages of a CCE is the ability of the community to develop local energy resources. These local projects, however, may be significantly more expensive than power purchases in the wholesale market, which can put upward pressure on rates. The costs of renewable energy have fallen dramatically in recent years, a trend that will be affected if the investment tax credit (ITC) for solar power is terminated at the end of 2016. Palo Alto recently signed a 30 year

[26] *Bay Area Smart Energy 2020* by Bill Powers, March 2012, page 108. (http://pacificenvironment.org/downloads/BASE2020_Full_Report.pdf)

power purchase agreement (PPA) for 80 MW of solar at a cost of 6.9 cents per kWh, and MCE stated it was recently getting bids for PV at 6 cents/kWh.[27] Although still more expensive than wholesale power purchases, renewable energy projects can provide a hedge against exposure in future energy markets, which can be volatile.

CCEs will need to consider the relative costs and benefits of local, small-scale solar projects balanced against power from larger centralized solar projects and power plants. Small installations on rooftops and parking lots are much more expensive per kWh than utility-scale facilities. For example, 80 MW scattered across rooftops and parking lots in and around Palo Alto would come in at a price higher than 6.9 cents because smaller, distributed sites cannot achieve the economies of scale that a utility-scale site can provide. MCE and SCP have addressed this by designing programs that offer customers the option to purchase electricity from local small-scale projects for a premium rate and by balancing their overall power portfolio with diverse resource types and contract terms.

[27] For reference, some of the most-recent power purchase agreements in the southwestern United States have seen levelized PPA prices as low as $50/MWh or 5 cents /kWh (in 2013 dollars). See http://emp.lbl.gov/sites/all/files/utility-scale-solar-2013-report.pdf.

V. Risks Associated with Starting a CCE Program

Establishing a CCE program provides many benefits to the community but is not completely without risk. The most salient risks are known and good management and applied experience can mitigate most of them, as the Marin and Sonoma programs have demonstrated.

Financial Risk: CCEs will face the same types of financial risks that all businesses face, such as those associated with cash flow, especially in the early stages of the program. These risks are manageable if program costs can be recovered in rates that are competitive. The main issue for jurisdictions participating in a CCE program is the extent of their liability in the event the CCE fails.[28]

MCE and SCP are each governed by a Joint Powers Authority (JPA) to which all participating jurisdictions must join by passage of an ordinance. Both JPAs have provisions, supported by CA case law, that immunize member jurisdictions against any contractual liabilities assumed by the CCE program, thus forming a legal firewall between the assets and liabilities of the JPA and those of the member cities' general funds. The cities of El Cerrito and Benicia, which are planning to join MCE, have analyzed this issue, which is available at http://www.el-cerrito.org/DocumentCenter/View/4174. In general, while there may be some risks to member jurisdictions in the event of CCE failure, they are not financial in nature and CCE jurisdictions have considered any remaining risks so low as to be acceptable.

A jurisdiction that decides to develop a CCE program without the protections of a JPA will need to consider the risks to the city and plan accordingly.

Competitive Rates: A key issue for a CCE program is whether it can provide power with the desired renewables mix at a competitive price. Renewable energy resource prices in wholesale markets have been falling but are still more expensive than traditional power supplies. Because price is so central to the success of the program, future CCE staff should continue to evaluate the overall trends of power prices in the market. In the near term, a pricing analysis will be an important component of any technical study.

MCE and SCP entered the market after wholesale electricity prices dropped to 3-4 cents/kWh due to excess supply in the market, at half the wholesale price of 2006-07. Low prices in the wholesale market will not last forever. Energy supply costs for PG&E and the CCE programs will depend upon the timing of contract commitments, hedging strategies and resource mix.

A report conducted for the City of Benicia by MRW & Associates offers a useful overview of potential rate issues in the coming years. In summary, the report states that "*given all of the factors that drive rate changes, it cannot be stated with certainty that the relationship between PG&E and MCE rates observed in August 2014 will continue year-to-year; however, it is reasonable to expect that MCE rates will on average remain competitive with PG&E's.*"[29]

Overall rates, according to MRW, will likely be driven by water availability, the price of natural gas, and the prices of renewable contracts entered into by MCE (and SCP) compared to those entered into by PG&E. MCE's rates are likely to remain competitive with PG&E's, but CCEs may have more market

[28] This risk is mitigated by contract language that insulates member jurisdictions from the liabilities of the JPA and the required posting of a $100,000 bond in the event that the program fails and customers must be returned to PG&E service.

[29] This report was included in an analysis prepared by the staff of El Cerrito as it planned to discuss joining MCE. The report can be found at: http://www.el-cerrito.org/ArchiveCenter/ViewFile/Item/2021.

exposure than PG&E in some circumstances. PG&E's Diablo Canyon nuclear plant provides a hedge against spikes in natural gas prices. In general, MRW concluded that higher gas prices would affect MCE more than PG&E, although given current gas production in the US, it seems reasonable to assume gas prices will remain low for the foreseeable future. CCE investments in renewable resources can be a hedge against spikes in natural gas prices. MRW's report concludes by saying, *"in the long run, with exit fees reduced to zero and Diablo Canyon retired, it is reasonable to expect that electricity bills through MCE will generally be lower than under PG&E."* And even if Diablo Canyon's license is extended, it would likely require substantial upgrades that will make it a higher-cost resource for PG&E. Other considerations related to CCE cost competitiveness include:

- Non-Profit Status: CCE programs administered under a JPA structure are non-profit and do not pay income taxes, large executive salaries, or shareholder dividends.

- 50% Renewable Portfolio Standard (RPS): The CPUC has considered raising the RPS to 50% by 2030[30], in which case all the load-serving entities will be seeking more renewable power. Whether or not this raises the prices of renewable power depends in large part on policy decisions; for example, whether the definition of "renewables" for this purpose will change to include additional resources, such as larger hydropower projects or unbundled RECs. Increased demand for renewable power to satisfy state requirements is likely to increase wholesale prices.

PG&E Green Option: PG&E will soon be offering its customers a 100% solar power product, which is expected to be similar to Marin's 100% local sol community solar project. The program offers two options[31]:

- The Green Tariff Shared Renewables (GTSR) gives customers the option of subscribing to services that will include either 50% or 100% solar resources in their supply portfolio.
- Enhanced Community Renewables (ECR) gives customers the option to buy subscription rights to receive energy from a new facility working directly with developers to identify and develop projects within their communities.

GTSR customers will pay an estimated premium of 2-3 cents/kWh, which may fall as solar costs fall and which would be less expensive for customers than SCP's Evergreen service option, which has a premium of 3.5 cents/kWh. As a community solar program, ECR customers pay developers for the rights to the output they subscribe to from a local solar project. As with GTSR, they will also receive a bill credit for energy they no longer need from PG&E's standard energy mix and a charge for program-related expenses. However, these charges and credits will be assessed based not on their consumption but on the kWh output of their subscribed solar panels. For example, if a customer owns 3% of a 1,000 kW solar system and that 3% generates 100 kWh in a year, those kWh are deducted from the customer's electricity bill.

Market Exposure: A CCE's energy suppliers could default or for some reason not provide the energy that was originally contracted for, forcing the CCE agency to enter the potentially expensive and volatile

[30] For more information, see http://www.cpuc.ca.gov/PUC/energy/Renewables

[31] More information is available at http://www.pge.com/en/about/environment/pge/greenoption/index.page?WT.mc_id=Vanity_greenoption

short-term market to meet customer load. Conversely, if the program locks in a number of long-term contracts and the market price for power subsequently falls, the CCE will not be able to take advantage of cheap power supplies. Good procurement practices minimize risks with diverse portfolios, owned power assets, and hedging strategies. In addition to pricing risks, there are also volume acquisition risks. For example, if CCE purchases do not match demand, it could face some market exposure. Again, such risks are mitigated with well-designed procurement strategies and integrated energy resource plans.

There is some risk associated with a mismatch between power purchase commitments and customer opt-out levels. MCE's opt-out rate has hovered around 23% and SCP's is closer to 11%. Neither CCE has reported significant liabilities as a result of opt-out rates.

Regulatory Risk: The CPUC has numerous ratemaking and policy-making functions that affect CCE risks and viability. The most critical of these are:

- **Exit Fees** – The utilities charge a "Power Charge Indifference Adjustment" (PCIA) to CCE customers to recover "stranded" investments in power; while there is an annual calculation overseen and approved by the CPUC, the utilities have an incentive to keep this rate high so that CCE rates are relatively less competitive;
- **Cost Allocations** – The utilities have an incentive to allocate costs to CCE customers' rates so utility rates appear more competitive. Currently, the utilities have used an account called the "Cost Adjustment Mechanism" (CAM) to impose generation costs on CCE customers that would not be permitted in the PCIA. They have also frequently proposed moving generation costs into transmission and distribution rates in order to reduce their own generation rates in ways that are may affect CCE competitiveness;
- **Rate Design** – The utilities have an incentive to set rates in ways that affect CCE competitiveness, for example, by including high fixed charges for transmission or solar project interconnections and stand-by power. The utilities are also implementing "green tariffs" as a way to compete with CCAs, which state law provides may not be subsidized by other ratepayers;
- **Resource Planning** – Utility resource plans should include realistic assumptions about future CCE load projections so that the utilities don't over-purchase power, which would later be allocated to CCE customers through the CAM or PCIA. The Commission regularly reviews related issues in its "LTPP" (long-term power procurement) proceedings;
- **Bonding Requirements –** Currently, CCEs have very limited bonding requirements, which are set at $100,000 per program to cover the costs of customers returning to the incumbent utility. If a CCE program closes down, all customers are automatically returned to utility bundled service. Substantial increases to bonding requirements could strain CCE finances;
- **Resource Adequacy –** California law requires all load-serving entities, including CCEs, to provide evidence that they will have power available during peak periods. MCE and SCP have so far been able to comply with state law without significant problems;
- **Direct Access –** Direct access permits customers to choose among many competitive providers. This program has been very limited in California but pressure is building with AB 286 making its way through the CA legislature to increase the cap and number customers who may participate, which could reduce a CCE's customer base;

The El Cerrito report and the SCP feasibility study provide more detailed information about risks.[32]

[32] The El Cerrito report can be found at: http://www.el-cerrito.org/ArchiveCenter/ViewFile/Item/2021.

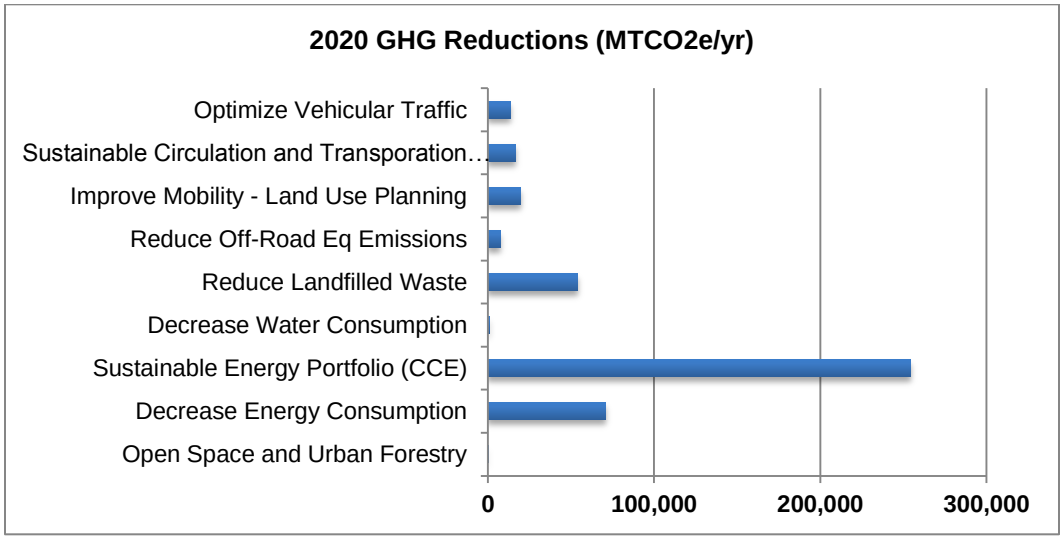
CPUC policies and decisions have not been consistently supportive of CCEs and the CPUC must balance many interests in its decision-making. In recent years, MCE has been active in CPUC proceedings, effectively on behalf of prospective CCE programs statewide. It will need support in the future and its interests may not always align with those of other CCAs.

Political Risk: Other jurisdictions considering CCE programs have met with varying levels of opposition mainly from PG&E and the International Brotherhood of Electrical Workers (IBEW) Local 1245, which represents some of PG&E's electrical workers. Publicly, union leaders have said that CCE programs that use in-state power, union labor, minimize or eliminate the use of unbundled RECs and emphasize local build-out would be welcomed. Lancaster and SCP did not face significant union/utility opposition. However, well-funded media campaigns in San Francisco and Marin County have misrepresented CCE program plans and results, creating program delays and high opt-out rates.

VI. Potential Environmental Impacts of CCE

Interest in CCE at the local level has been driven in part by the program's prospects for supporting progress toward adopted climate action goals. Several local climate action plans have identified CCE as the single most effective way to reduce a city's carbon footprint, as the figure below demonstrates for the City of Sunnyvale. CCE programs can be platforms to accelerate deployment of renewable energy and electric vehicles, implement energy efficiency programs tailored to local needs, and develop innovative programs to motivate local investments in renewable energy. Because CCE programs are designed to be self-supporting, while also meeting the goals of a city or county's climate action plan, participation in a CCA also contributes to avoided costs of environmental compliance.

Figure 4: Sunnyvale Climate Action Plan Projected GHG Reductions by 2020



According to its website[33], PG&E in 2013 had a carbon intensity of 427 lbs. per MWh compared to 364 lbs. for MCE[34] and 294 lbs. for SCP. The partners involved in SVCCEP collectively had a total electricity

The Sonoma study can be found at: https://sonomacleanpower.org/wp-content/uploads/2015/01/CCA-Feasibility-Report-2011-10.pdf

[33] http://www.pgecurrents.com/2015/01/30/pge-cuts-carbon-emissions-with-clean-energy/

[34] http://www.mcecleanenergy.org/wp-content/uploads/Understanding-MCE-GHGs-Emission-Factor_2013_3-16-2015_2.pdf

consumption in 2013 of about 3.2 million MWh. As the chart below illustrates, had the SVCCEP jurisdictions had the emissions rates of Marin or Sonoma, its total GHG emissions would have been 14.8% or 31.1% lower than PG&E, respectively.

Table 9: Potential GHG Benefits of a SVCCEP Program

METRICS	PG&E	MCE	SCP
Lbs. CO2 emitted per MWh	427	364	294
Energy consumed by SVCCEP agencies in 2013*: 3,196,761 MWh			
Total CO2 emissions (metric tons)	619,035	527,702	426,221
Emission Reductions (metric tons)	0	91,333	192,814
Percentage Reduction from PG&E Baseline	0	14.8%	31.1%
Equivalent number of cars taken off the road**	0	19,228	40,593
*includes Sunnyvale, Cupertino, Mountain View and unincorporated Santa Clara County. Information provided by City of Sunnyvale ** http://www.epa.gov/cleanenergy/energy-resources/refs.html			

Despite these impressive numbers, it should be noted that GHG emission calculation methodologies are the source of some controversy. The CPUC recently directed MCE, SCP and PG&E to leave estimates of GHG reductions off of their annual rate comparison documents until and unless they settled on a common methodology. Many experts believe using the GHG emissions rate in MTCO2/MWh is an oversimplification that does not take into account several factors. Below are two examples that demonstrate the level of nuance included in assessing the GHG impacts of a CCE program:

- Marginal Load: Utilities manage their power generation according to "marginal load" requirements. "Base load" plants serve basic requirements and typically run all the time, such as nuclear or hydropower plants that are carbon free. When additional power is required "on the margin," those that can be deployed quickly tend to be more expensive to operate than base load plants. The Sonoma feasibility study assumed that a CCE's load would be primarily displacing the more carbon-intensive marginal load. If PG&E suddenly had fewer customers, it would change the way it operated its gas plants before its hydro or nuclear facilities. In this case, assuming displacement of electricity of PG&E's *average* emissions rate would potentially *undercount* emission impacts; that is, undercount the reductions achieved by a CCE.

- Cap and Trade: California has a Cap-and-Trade program whereby most large power plants' carbon emissions are regulated. Power plants are either given allowances to emit carbon, or companies buy allowances at auctions run by the Air Resources Board (ARB). Power plants can sell surplus allowances, and conversely, some facilities may have to buy more allowances. Penalties are issued for facilities that emit more GHGs than have allowances in their account. While this trading goes on between regulated power plants, the total number of allowances is does not change, except for a gradual reduction to meet the 2020 goal of 427 million tons of emissions (10% below 1990 levels). The idea behind Cap-and-Trade is that the State reaches its goal by providing as much flexibility in the market as possible. If CCEs increase the production of

renewable energy, capped fossil-fuel plants may be used less, thus enabling them to sell surplus carbon allowances to other facilities that – as a result – might not otherwise reduce their emissions. The result, therefore, could be no net decrease in GHG emissions. To counteract this potential result, ARB created a set-aside program where renewable energy producers could apply to ARB to have the corresponding GHG-reduction value from their power result in allowances being retired instead of sold – essentially lowering the overall cap. This would help ensure the environmental integrity of renewable energy projects, and CCE programs should consider applying to ARB to participate in this set-aside allowance program to assure the CCE program is reducing carbon emissions.

VII. Recommendations and the Path Forward

The prospects for CCE programs in California have improved significantly in recent years as a result of a variety of circumstances:

- The success of MCE and SCP and soon the City of Lancaster in program management and power procurement and providing their communities greener power at competitive prices;
- Favorable wholesale energy market conditions, which is providing relatively low cost power;
- Recognition that a CCE program can be a self-supporting option for meeting Climate Action Plan objectives and other local public policy goals;
- Reduced cost of renewable power and improvements in renewable technologies; and,
- The development of expertise, best practices and an expanded vendor base to serve CCE programs.

As a result, SVCCEP can reasonably project that a CCE program in Silicon Valley will be successful, assuming a well-designed, well-managed program. This is especially true if wholesale market prices remain low and the program is able to manage growth and spread fixed costs over a growing customer base over time.

LEAN has worked with the SVCEEP team to develop a phased work plan, timeline, and planning budget to conduct the requisite analysis and stakeholder engagement for decision-making, and to prepare for the launch of a CCE program and entity. Figure 5 below provides an overview of the work plan and timeline.

Work Plan:

The work plan for CCE program launch is divided into three phases. The first phase involves an initial exploration of program viability (fulfilled by this report) and a subsequent technical study. During this phase, community engagement strategies are also launched and readied for expansion during subsequent phases. If the technical study indicates a CCE program can meet SVCCEP policy objectives and be sustainable at competitive rates, SVCCEP can move to Phase 2, which would involve program design, procurement solicitation for energy services, expanded community engagement, and formation of the Joint Powers Authority that would govern the program. Phase 3 builds on Phase 2 as the program

moves towards implementation, customer enrollment and preparing for launch of an independent operation. SVCCEP may elect to move some components, such as JPA formation, forward to facilitate expedited progress throughout the phases.

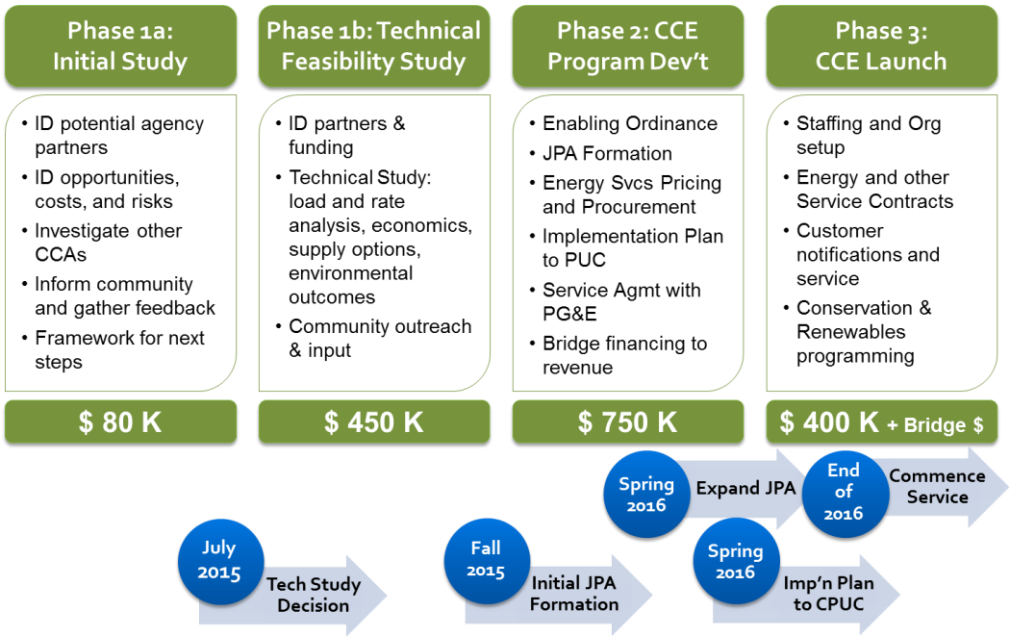
Timeline:

The program timeline included in this report is an assertive one. Depending on political will and availability of expertise and resources, SVCCEP could launch a CCE program by the end of 2016. While the practicality of this timeline hinges on resources and motivated leadership, it also supported by a heavy reliance on leveraging the experiences and products of the successfully operating CCE programs.

Budget:

The estimated cost for SVCCEP to launch a program is $1.6 million. This investment can be repaid by program revenues after the program launches. The program budget is a program level estimate and would be refined as consultant agreements are negotiated, and progress and experience gained. This budget is intended to be inclusive of vendor and consultant costs as well as internal staff costs to manage the project, implement requisite components, and provide critical advice or support to the partnership as it launches a new public agency. This budget tracks well with the $1.7 million Sonoma County Water Agency expended to support the launch of Sonoma Clean Power. In addition to this budget, SVCCEP will need to provide approximately $100,000 for program bonding as well as some level of loan guarantee to support outside financing/working capital to cover initial power contracts and cash flow in the first months of the program in amounts that will depend upon expected load and program phase-in.

Figure 5: Possible CCE Timeline and Budget



Recommendations

- SVCCEP should articulate objectives and goals for a CCE program in order to assess the prospects of program success and begin considering how to design a program in the service of its goals and objectives
- SVCCEP should engage consultants for a technical study that will focus on quantitative analysis such as load forecasting, portfolio design strategies, initial program size, and financial requirements, considering updated market prices and PG&E rates. The study should consider the area's heavy commercial and industrial load, which will present opportunities and challenges that may differ in some aspects from the experiences of MCE and SCP. The risk analysis that has already been performed for other communities will likely apply equally to SVCCEP.
- SVCCEP should continue to engage other Santa Clara cities to assess their interest in the program and participation in the CCE technical study
- SVCCEP should begin a process of engaging various constituencies in the community to identify community interest and promote an understanding of the program. Other jurisdictions have developed strategies to promote community awareness that may be useful to SVCCEP.
- If SVCCEP moves ahead with the program, it should begin developing a JPA organization with professionals who have experience in retail electricity services, program design, finance, wholesale purchasing and renewable resource development.

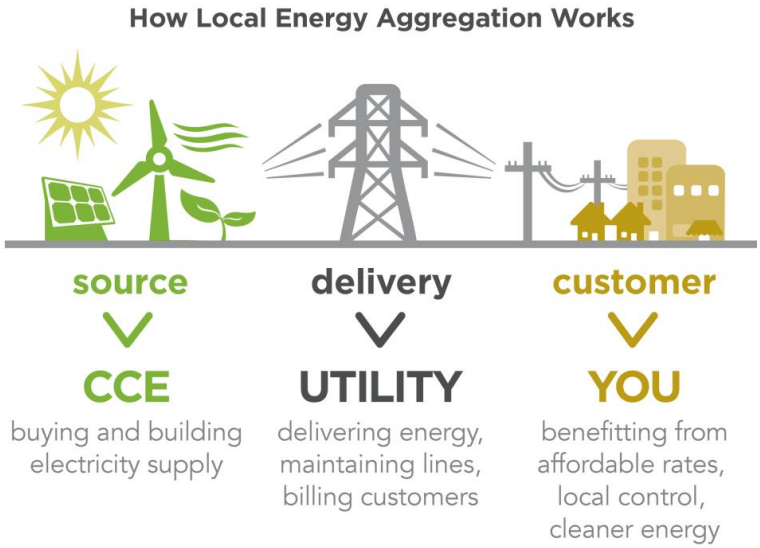
APPENDIX 1: Glossary of Terms

Term	Meaning
Behind-the-meter	Refers to energy efficiency or electricity generation that takes place on the customer side of the electricity meter rather than on the utility/grid side.
California Public Utilities Commission (CPUC)	California's State agency in charge of regulating investor-owned utilities.
Community Choice Aggregation	The legal term used in AB 117 and by the CPUC for programs herein referred to as Community Choice Energy. As authorized by statute, CCA allows local governments to pool the municipal, residential and commercial electrical load within their municipalit(ies) for the purpose of procuring and developing power on their behalf.
Demand response	Technology that lowers electricity demand (or consumption) in response to shortages in the available supply of electricity.
Direct Access	A program that permits utility customers to purchase power supplies from a provider other than the incumbent utility; CCE programs are not considered direct access
Feed-in tariff	A standard power contract, usually for small projects 1MW or less, that requires the utility to pay a set amount for generated renewable electricity for a set number of years, depending on technology.
Greenhouse gas (GHG)	A gas that causes the atmosphere to trap heat radiating from the earth. The most common GHG is Carbon Dioxide, though Methane and others have this effect.
MWH (megawatt-hour)	A unit of electrical energy that is produced or consumed= to 1,000 kilowatt hours. Thus, 8,000 kwh = 8 MWh.
Implementation Plan	A plan CCAs must present to the CPUC for its certification and review for consistency with state law and CPUC rules
Investor-owned utility	A privately-owned power distribution company, such as Pacific Gas and Electric (PG&E), that in California is regulated by the CPUC.
Joint powers authority (JPA)	An entity permitted under the laws of some states, whereby two or more public authorities (for example, local governments, or special districts) can operate collectively.
Electric Load	The amount of electricity a customer or group of customers uses; also referred to as "demand."
Load-serving entity	A firm or organization that purchases electricity on behalf of any customer or group of customers. Once formed, a CCA is considered a load serving entity.
MW (megawatt)	A unit of electrical power equal to 1 million watts that expresses the capacity (or power rating) of power plants or consuming devices. As a unit of capacity, a MW is distinct from a MWH, which is a unit of electricity. For example, a solar plant with a *capacity* of 1 *MW* will – running at fully capacity – produce a *MWH* of *electricity* in one hour.
Microgrid	A local, small scale power grid that can operate independently of or in conjunction with the central utility system.

Net metering	A state-mandated program through which utility customers with behind-the-meter renewable generating facilities smaller than 1 MW can receive bill credit for power not used on-site and delivered to the grid (causing the meter to run backwards).
PCIA or “exit fee”	Power Charge Indifference Adjustment (PCIA) is an “exit fee” based on stranded costs of utility generation set by the California Public Utilities Commission. It is calculated annually and assessed to customers who take service from an electric generation provider (e.g. CCE) other than the incumbent utility.
Peak load	The electrical power demand at that time, over the course of a year and during the day, when electricity consumption is greatest.
Power Purchase Agreement (PPA)	Term for energy supply contract
Renewable energy certificate (REC)	A certificate of proof that one MWh of electricity was generated and delivered to the grid by an eligible renewable energy resource. A REC can be sold together with the underlying energy or “unbundled,” and sold separately.
Renewable portfolio standard (RPS)	Law that requires CA utilities and other load serving entities (including CCAs) to provide an escalating percentage of CA qualified renewable power (culminating at 33% by 2020) in their annual energy portfolio.
Community shared solar	An arrangement by which many electricity customers in a community may each own a portion of a solar PV generating facility, and therefore receive a share of the electricity and/or revenue it generates.
Smart grid	An electricity supply network that uses electronic communications and management systems to respond to changes in system requirements.
Solar PV	A solar electricity generating technology in which solar energy is transformed into electricity through a photovoltaic (PV) effect.
Unbundled RECs	Renewable energy certificates that verify a purchase of a MWH unit of renewable power where the actual power and the certificate are “unbundled” and sold to different buyers.

Community Choice Energy (CCE)
Frequently Asked Questions

- **What is Community Choice Energy?** Community Choice Energy (CCE) is a program that enables city and county governments to pool (or aggregate) the electricity demand of their communities for the purpose of supplying electricity. A CCE buys and/or develops power on behalf of the residents, business, and government electricity users in its jurisdiction. The electricity continues to be distributed and delivered over the existing electricity lines by the incumbent utility-which is Pacific Gas and Electric (PG&E) in Northern California.



- **How will CCE be administered in Silicon Valley/Santa Clara County?** The CCE program will be administered by a joint powers agency that serves as a public, non-profit agency on behalf of municipalities that choose to participate in the CCE. It is important to note that through the JPA structure, the assets and liabilities of the JPA remain separate from those of the County or City general funds. Thus, any surplus funds generated by the CCE will be reinvested back into the community in the form of new energy projects and programs and will not flow back into the general funds of the JPA's member jurisdictions.

- **How are CCE's funded?** All CCEs, once they are operational, are completely ratepayer funded and are not subsidized by taxpayer dollars. Ratepayer revenues for electrical generation services currently go to the incumbent utility (PG&E), but would be re-directed to the CCE program which would become the County's default provider of electrical generation services.

- **Why are so many local governments considering CCE?** CCEs provide consumer choice where none currently exists and have also resulted in lower electrical generation rates.[35] In addition, CCEs provide communities with local control over their energy supply, allowing them to increase the amount of electricity procured from renewable sources, such as solar, wind, and geothermal. CCEs can also develop innovative energy programs tailored specifically to their communities and support the development of local renewable energy projects. Finally, CCEs introduce competition into the energy market, which helps drive costs down, stimulate new

[35] http://www.mcecleanenergy.org/residential-rates/
http://sonomacleanpower.org/for-my-home/rates/

energy investments, and diversify power choices. Customers in a CCE jurisdiction can choose to stay with the CCE program or return to PG&E's generation service; customers always have the power to choose.

- **What are the economic advantages of CCE?** In addition to the potential for customer rate savings and the economic value of ratepayer revenues serving our community rather than a utility territory ten times our size, CCEs can accelerate the development of local renewable energy projects and facilitate other energy innovations such as energy efficiency retrofits, home area networks, battery storage and EV charging stations to name a few. This translates into the potential for new local services and consumer benefits as well as significant regional and local job creation. It should be noted that renewable energy facilities provide many more jobs per unit of investment than traditional natural gas and coal plants.[36]

- **What are the environmental advantages of CCE?** CCEs can choose to purchase from and develop electricity sources that are more heavily weighted towards renewable energy and carbon free power resources. The production and burning of traditional energy sources, such as coal and natural gas, generates large amounts of GHG emissions into the atmosphere. These GHG emissions are a leading cause of pollution and climate change.

- **How does this relate to my city's Climate Action Plan?** Many cities and counties now have "Climate Action Plans" that outline various measures that the city or county can take to reduce its GHG emissions and conserve natural resources. In Santa Clara County, electricity consumption is a main source of GHG emissions. Joining a CCE is one way jurisdictions in the county can reduce their GHG emissions from electricity and meet their local climate goals.

- **Has this been done in other areas and what are the results?** There are two CCE programs up and running in California: Marin Clean Energy (MCE) in Marin County and Sonoma Clean Power (SCP) in Sonoma County. Both MCE and SCP offer their customers 10-30% more renewable energy than PG&E at prices that are competitive and currently lower than PG&E's rates. MCE and SCP are now actively procuring and co-developing in-State and local renewable resources and offering specialized energy programs designed for their local service areas. A third CCE in the City of Lancaster will begin serving customers in May, 2015 and there are many local governments in California currently investigating CCE's potential for their communities.

- **If a CCE is formed in Silicon Valley/Santa Clara County, what is PG&E's role?** If a CCE forms in Santa Clara County, the CCE would be responsible for buying and/or developing all the electricity required to meet the demands of its customers. Customers who choose to opt-out of the CCE would continue to have PG&E buy their electricity. All customers, whether they are a part of the CCE not, continue to pay PG&E for transmission and distribution services and receive a single, consolidated bill from PG&E. The only difference between a CCE and PG&E customer's bill is the source of electricity and line-item charge for energy generation.

- **If the power goes out, will PG&E still fix a CCE customer's outage problem?** Yes, PG&E continues to provide the same delivery, line maintenance, and customer services regardless of whether that home or business is part of the CCE program.

- **If I join a CCE, will my electricity rates go up?** A technical study will examine the impacts of a CCE on rates, but so far, CCE electrical rates have generally been 5%-8% lower than PG&E's

[36] Pollin, Robert.2012.Economic prospects-getting real on jobs and the environment: pipelines, fracking or clean energy? New Labor Forum 21(3):84-87

rates. This is dependent on the customer class and the particular CCE option each customer chooses. Current CCEs offer a "default" option that is both cleaner and cheaper than PG&E, as well as a 100% renewable energy option that is slightly more expensive than PG&E's default product. In addition, CCEs have the added advantage of price stability. While PG&E rates change several times a year, CCE rates generally adjust once per year, offering a measure of rate stability for CCE customers. While there is no guarantee that CCE generation rates will always be lower than PG&E's generation rates, CCEs do have the advantage of being small, non-profit agencies that pay no shareholder dividends, high corporate salaries, or income taxes like investor-owned utilities do.

- **How does a CCE procure electricity?** A CCE must submit a plan to the California Public Utilities Commission (CPUC) that specifies how it will purchase 115% of the estimated electricity demand for its area for a period of one year. Once the plan is approved, CCEs negotiate the purchase of electricity for its service area on the open energy market by entering in power purchase agreements (PPAs) with energy providers. These PPAs can be long or short term, depending on the needs of the CCE and type of energy being provided. A CCE can also sponsor a bidding process whereby project developers can bid to build new electricity sources solely for CCE customers. Through a utility service agreement, the power a CCE procures is transmitted over PG&E's power lines.

- **Do the electrons purchased or generated by the CCE actually go to my house?** No, when we say that the CCE supplies power to customers, we mean that the CCE puts the same amount of electricity onto the grid that its customers use. When the individual electrons from all power resources go onto the grid no one can determine which electrons go where. Think of it as depositing $100 in one ATM and taking out $100 in another. It's not the same $100 bill, but it's still your money. One can think of electricity in the same way. If you consume 500 kilowatt-hours in a month, the CCE must supply 500 kWH to the grid on your behalf. The advantage of a CCE is that what's supplied to the grid on your behalf can be both cleaner and less expensive than what PG&E is putting on the grid.

- **How is a CCE program set up?** Local governments must pass an ordinance to join a CCE program, and the CCE agency must draft an Implementation Plan that is approved by the CPUC. This is typically done after an initial technical study to determine the amount of electricity that will be required and to examine a CCE's ability to be cost competitive with PG&E. The Implementation Plan outlines how the CCE will function, how it will set rates, how it will procure electricity, and how it will carry out all other functions required under CPUC regulations.

- **I have heard that CCEs are "opt-out" programs. What does that mean?** When a county or city decides to create or join a CCE, all customers within that jurisdiction are automatically enrolled in the CCE; the CCE becomes the default provider of electrical supply. However, any customer can choose to opt-out and return to the incumbent utility (PG&E) for *generation* service at any time (remember: gas service, electric power delivery and customer billing is always provided by PG&E). State law requires that customers receive several notifications to opt-out just before and just after a CCE program launches. At any time after that initial launch period, a CCE customer can return to the incumbent utility's service for a small administration fee.

- **What is the governance structure of a CCE?** There is no law regulating how the how the governing body a CCE should be structured, so each CCE is a little different. Most CCEs are governed under a Joint Powers Agreement by a Board of Directors. The Board of Directors is usually comprised of a representative from each member city (and the county) within the CCE jurisdiction. The Board sets the CCE's policies and electricity rates. A CCE may also have an

advisory committee made up of representatives from other stakeholder groups, such as local businesses and community organizations. CCEs also employ a small staff to run the day-to-day operations of the program and interface with CCE customers. As a public agency, the CCE process is designed to be very transparent with all meetings and information open to the public.

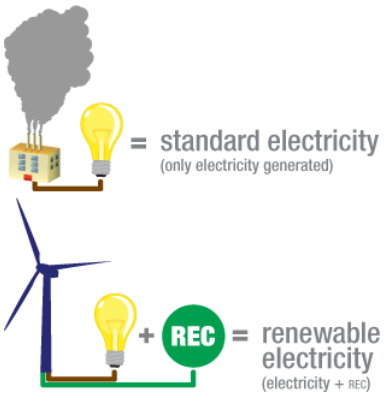
- **If I installed solar panels on my home or business, would I need a Power Purchase Agreement to sell our excess energy to a CCE?** No. This is called net metering, and the CCE would be able to offer property owners fair market rates for their excess energy production without a Purchase Power Agreement, even if that solar installation took place before the CCE launched. CCEs have been able to offer better net metering rates for customers who generate surplus electricity, and those customers would automatically be enrolled into a CCE's net metering program, unless they choose to opt-out and remain with PG&E. Larger solar projects that are "in front of the meter" can also be facilitated under a CCE's feed-in-tariff program which uses a standard power contract with set prices to buy all the power generated from that facility on behalf of CCE customers.

Are there other websites/resources I can check out? Yes.

For information about Marin's CCE program, go to www.mcecleanenergy.com
For information Sonoma's CCE program, go to www.sonomacleanpower.org.
For general information about CCE, go to www.leanenergyus.org.

Renewable Energy Certificates FAQ

What is a REC? A Renewable Energy Certificate or REC is a tradable commodity that represents the environmental attributes of energy generation from qualified renewable power resources, e.g. wind, solar, geothermal, and small hydro. A REC, and its associated attributes and benefits, can be bought and sold together or separately from the underlying physical electricity produced by a clean power generator. As renewable generators produce electricity, they create 1 REC for every 1 megawatt-hour (MWh) of electricity placed on the grid. If the physical electricity and the associated RECs are sold together, that is called "bundled renewable energy." If the electricity and REC is sold to separate buyers, the REC becomes "unbundled" and the electricity produced is no longer considered "renewable" or "green." The reason is because, under the current market structure, *it is the REC that conveys the environmental attributes of the renewable electricity, not the electricity itself.* This latter point is often confusing to people and has created much of the debate and contention that we see today related to the value of unbundled RECs. The following is an illustrated description of a REC and its relationship to the power source.



Source: Center for Resource Solutions

When Did RECs Come About and Why? RECs were created and introduced in the late 1990s by the U.S. EPA in response to a growing desire for and adoption of state policies to support the increased development of new renewable power resources across a diverse geography. The idea is that utilities, companies and individuals can support the construction of new clean power plants by buying RECs without actually receiving the electrons, which is ultimately good for the planet. The basic rationale for RECs is that they: 1) help spur new power development because they have a financial value not limited to a specific power plant or geography, and 2) they help utilities and other load-serving entities (like Community Choice Programs or CCAs) achieve their state environmental compliance goals, such as renewable portfolio standards (RPS).

Why Do RECs Matter? Traditional utilities CCAs want to obtain as much renewable energy as possible on behalf of their customers while also keeping prices competitive. Through the purchase of a REC, a CCA can meet its renewable energy goals and RPS compliance mandates because the REC buyer obtains the environmental attributes of the renewable power. In addition, unbundled RECs are generally cheaper than the physical power from a solar or wind plant, so they can help keep costs down.

Can more than one entity claim the value of a REC? No, this is not supposed to happen; once the credits are claimed, the RECs are retired. While not required, REC buyers should purchase them from an official registry and clearinghouse (known as WREGIS), which tracks and accounts for all RECs in the

Western region of the US. Buying through WREGIS or one of their accredited partners means only the buyer of that REC can claim its carbon reductions and other environmental benefits. Once that value is used/attributed, the REC is retired so as to avoid abuse and "double counting."

Do the CCAs in Marin, Sonoma, and Lancaster use RECs? Yes. RECs are used to support the *voluntary* renewable energy content of the CCA portfolios in Marin and Sonoma; this is the clean power purchase that goes beyond the mandated power procurement requirements outlined in California's RPS. It should be noted that Sonoma Clean Power has adopted a policy to use minimal unbundled RECs, and only 3% of its power is attributable to that source.

Does PG&E Use RECs? Yes, PG&E issued a request for proposal to purchase unbundled RECs as recently as January 2015. [37]

Why are RECs so controversial?: Different people have different interpretations of RECs, but the controversy really lies with the use of *unbundled* RECs, wherein the environmental attributes conveyed with the certificate are separated from the electrons that are placed on the grid. While the arguments can get complicated, proponents of RECs believe that RECs, because they have both financial and compliance value, support and incentivize the construction of new renewable power plants. Proponents argue that more renewable energy plants exist today because RECs have helped make new power projects more financeable. In addition, RECs have helped reduce the costs of compliance with state RPS policies that mandate a certain percentage of energy demand is met through qualified renewable energy. Remember that unbundled RECs are cheaper than a bundled REC, but they count toward the State RPS. This is why opponents of unbundled RECs believe they are essentially a cheap tool for "greenwashing" dirty power. A utility or CCA, for example, may buy fossil fuel electricity but can legally claim they are meeting their renewable compliance goals by purchasing RECs. In addition, opponents are concerned that customers may not have a full and clear picture of what they are buying without a requirement to disclose the use of unbundled RECs in a power portfolio.

Additional Resources:

US EPA: http://www.epa.gov/greenpower/gpmarket/rec.htm
CA Public Utilities Commission:
http://www.cpuc.ca.gov/PUC/energy/Renewables/FAQs/05REcertificates.htm
Local Clean Energy Alliance:
http://www.localcleanenergy.org/files/What%20the%20Heck%20is%20a%20REC.pdf
Center for Resource Solutions/Green-e: http://www.resource-solutions.org/progs_greene.html
Western Renewable Energy Generation Information System: www.wregis.org

[37] See
http://www.pge.com/includes/docs/pdfs/b2b/wholesaleelectricsuppliersolicitation/RPS2014/RPS_Solicitation_Protocol_01052015.pdf

MARIN CLEAN ENERGY

OPERATING FUND
Proposed Budget
Fiscal Year 2015/16

	2014/15 Proposed Amended Budget	2015/16 Proposed Budget	Increase (Decrease)
REVENUE AND OTHER SOURCES:			
Revenue - Electricity (net of allowance)	$ 99,126,394	$ 145,933,097	$ 46,806,703
Revenue - Consideration from lease termination	400,000	-	(400,000)
Total sources	99,526,394	145,933,097	46,406,703
EXPENDITURES AND OTHER USES:			
CURRENT EXPENDITURES			
Cost of energy	87,900,551	129,522,715	41,622,164
Personnel	2,140,000	2,964,000	824,000
Technical consultants	545,000	629,000	84,000
Legal counsel	405,000	360,000	(45,000)
Communications consultants and related expenses	750,000	751,000	1,000
Data manager	2,550,000	2,862,000	312,000
Service fees - PG&E	705,000	921,000	216,000
Other services	354,000	418,000	64,000
General and administration	370,000	329,000	(41,000)
Occupancy	-	260,000	260,000
Integrated demand side pilot programs	-	50,000	50,000
Marin County green business program	15,000	10,000	(5,000)
Low income solar programs	25,000	35,000	10,000
Total current expenditures	95,759,551	139,111,715	43,352,164
CAPITAL OUTLAY	420,000	150,000	(270,000)
DEBT SERVICE	1,195,000	1,020,000	(175,000)
INTERFUND TRANSFER TO:			
Renewable Energy Reserve Fund	-	1,000,000	1,000,000
Local Renewable Energy Development Fund	109,994	151,383	41,389
Total interfund transfers	109,994	1,151,383	1,041,389
Total expenditures	97,484,545	141,433,098	43,948,553
Net increase (decrease) in available fund balance	$ 2,041,849	$ 4,500,000	$ 2,458,151

NOTES/COMMENTS

Electricity Revenue - projected revenue includes expanded territories and rate increases.
Cost of energy - projected cost of energy includes expanded territories.
Personnel - increase due to planned staff hires for new territories, transitioning work performed by external communications consultants to staff, and cost of living adjustments and raises.
Technical consultants - costs increase with expanded territory.
Legal - drop from prior year, when unexpected costs related to AB 2145 occurred.
Communications - essentially holding flat, with transition to replace external consultants with staff.
Data Manager - Noble Solutions charges per meter, which increased with territory expansion.
Service Fees PG&E - charged by the account which increased with territory expansion.
Other Services - planned increase for inflation, costs related to setting up thenew building.
G&A - this category no longer includes office lease, so the budget is reduced from last year. Costs associated with the new building and additional staff will offset some of this savings.
Occupancy - this new catefory includes office lease, utilities and maintenance in the new office building.
Capital Outlay - capital required for tenant improvements, employee workstations in new building.

APPENDIX 5: SCP 2015/2016 Operating Budget

Sonoma Clean Power Authority
DRAFT Fiscal Year 2015-2016 Operating Budget – Page 1 of 2

		DRAFT Budget FY15-16
REVENUES AND OTHER SOURCES		
Electricity Sales[1] (net of allowance)	164,824,000	
EverGreen Premium[2] (net of allowance)	671,000	
Total Revenues		165,495,000
EXPENDITURES		
Product		
Cost of energy and resource adequacy[3]	130,110,000	
Data Management	3,208,000	
Service Fees to PG&E	1,041,000	
Product Subtotal		134,359,000
Personnel		2,033,000
Outreach and Communications		782,000
Customer Noticing		352,000
General and Administration		488,000

[1] Forecast sales are 2,200,000 MWh, and includes an allowance of 0.5% of sales for uncollectible accounts.
[2] The EverGreen premium is exclusively used to pay the additional cost of local, Sonoma County produced renewable energy.
[3] Includes energy, renewable energy, NetGreen cash-outs, ProFIT payments, resource adequacy, California Independent System Operator fees, and scheduling fees.

Sonoma Clean Power Authority
DRAFT Fiscal Year 2015-2016 Operating Budget – Page 2 of 2

		Draft Budget FY15-16
EXPENDITURES – continued		
Other Professional Services		
Legal	220,000	
Accounting	165,000	
Technical	780,000	
Legislative and regulatory advocacy	235,000	
Other consultants	160,000	
Other Professional Services Subtotal		1,560,000
Programs		
Pilot Program Implementation	1,200,000	
Program Development and Evaluation	150,000	
Other Professional Services Subtotal		1,350,000
Total Expenditures		140,924,000
OTHER USES		
Capital Outlay		282,000
Collateral Deposits		7,000,000
DEBT SERVICE		
Debt Service		382,000
Total Expenditures, Other Uses and Debt Service		148,588,000
Net Increase/(Decrease) in Available Fund Balance		16,907,000