A White Paper on Community Choice Aggregation
The Opportunity and its Status Nationally

By Ellen Lee

Introduction

The growth of the renewable energy market has sparked an evolution in electricity procurement and begun to shift towards a local and community-based model. The new concept in the sustainable grid and utility world is Community Choice Aggregation. In order to answer the demand for renewables and further push clean energy into the grid, many cities and counties have been partnering or "aggregating" their electrical demand, such that the CCA can procure and supply electricity to its conglomerate residents, businesses, and municipalities. Serving as a localized energy provider, CCAs, along with its communities, will allow for more control over the procurement and sources of electricity to accelerate the green power movement while saving consumers money.

This not to say that major investor-owned utilities, such as Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric, will be omitted from the electricity purveyance equation. Simply put, the CCA will purchase the power to fulfill the demand of its community, the electricity will continue to deliver through the utility's infrastructure, and if all goes well, the electricity consumer will obtain the power at an affordable and more stable rate.

With over two decades of success and many established CCAs, the progression of community-based green power has proven fruitful and valuable to answering the call for clean energy alternatives. This white paper aims to delineate the nuances and forward-thinking of Community Choice Aggregation; embedded within its structure, accessibility, equity, affordability, "democracy," and sustainability.

History

Paul Fenn, the pioneer of CCA, paved the way to the first CCA in Cape Cod, Massachusetts. In 1994, Fenn aimed to reengineer the grid and integrated distributed renewable energy resources by innovating energy policies and programs, ultimately resulting in the introduction of the Competitive Franchise Bill and along with it, "Consumer Service Districts." [1] Three years

[1] Lean Energy US, "Massachusetts," http://www.leanenergyus.org/cca-by-state/massachusetts/.

later, the Utility Restructuring Act of 1997 was signed into law in Massachusetts and from this came Cape Light Compact, the nation's first CCA. Cape Light Compact serves over 200,000 electricity consumers in 21 towns across Cape Cod and Martha's Vineyard and provides a "Green Power Supply" option. This Massachusetts CCA also launched an Energy Efficiency Program, which has succeeded in installing over 15,000 LED streetlights and returning an annual savings of $800,000 for its cities.[2]

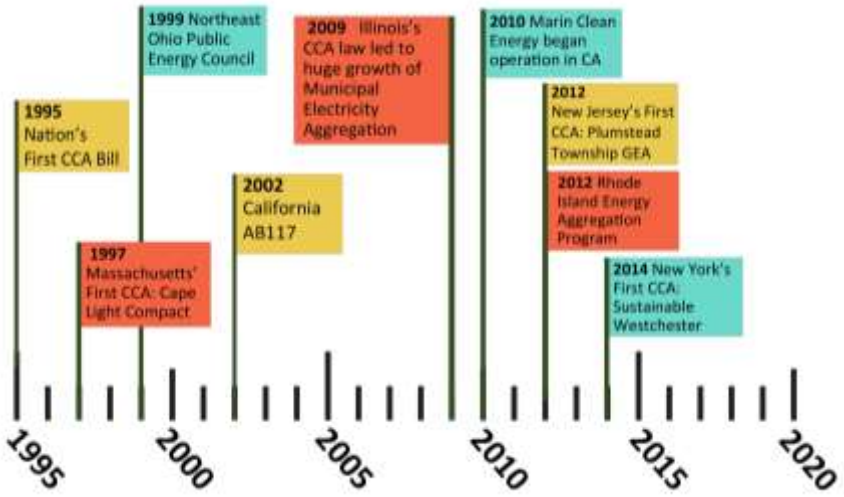

Figure 1: Timeline of CCAs across the nation

Now other states, including Ohio, California, Rhode Island, Illinois, New Jersey, and New York, have launched or will launch CCAs of their own. The secession from monopolized electrical utilities has ignited local energy security and investments in alternative clean power developments. A still rapidly growing concept, CCAs secure over 25% of the nation's electricity demand across seven states and over 1,300 municipalities, accounting for 5% of nation's population.[3]

In California recent electricity industry history, the deregulation of this market in 1996 prompted a series of events that ultimately resulted in the formation of California's CCA legislative structure. Through the deregulation provided by AB 1890, California saw an influx of electricity suppliers and IOUs that were financially motivated to target high-volume electricity consumers to increase returns, offering only some clean energy options. This bill allowed customers to purchase their power from alternative non-IOU entities, provided that the customer explicitly choose new said provider. More simply put, this bill enacted an "opt in to a new service" feature.[4]

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[2] Cape Light Compact, " Energy Efficiency for Your Home, Your Business, Your Municipality," http://www.capelightcompact.org/energy-efficiency/.

[3] Local Power, "Community Choice Aggregation," http://www.localpower.com/CommunityChoiceAggregation.html.

[4] AB 1890, Public Utilities: electrical restructuring, (California 1995), ftp://www.leginfo.ca.gov/pub/95-96/bill/asm/ab_1851-1900/ab_1890_bill_960924_chaptered.html.

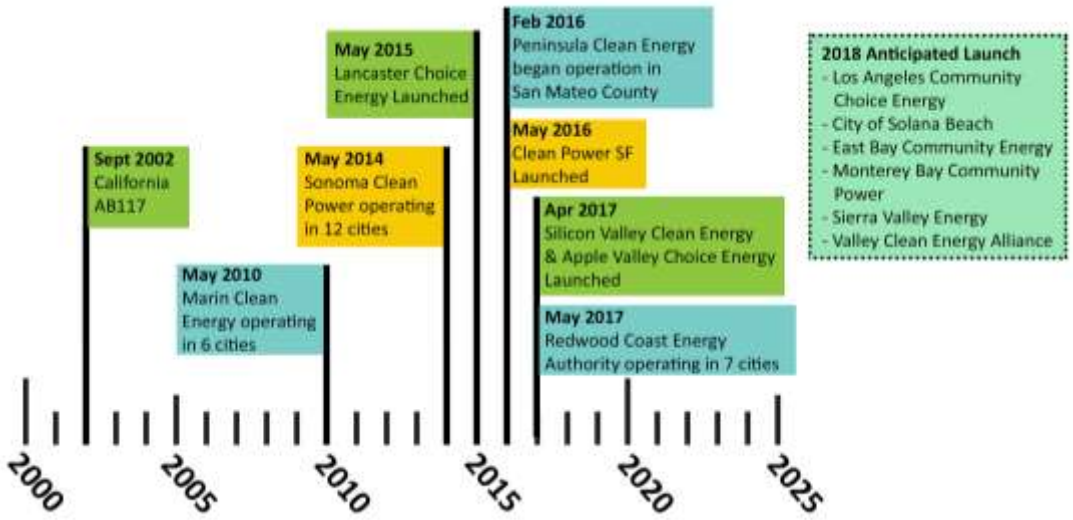

Figure 2: Timeline of California CCAs

In addition, the energy crisis in the early 2000s, characterized by rising electricity bills and brownouts, pushed the California Public Utilities Commission (CPUC) to veer away from the monopoly IOU model. It was not until 2002, when AB 117 was introduced and signed into California law, that eliminated major organization barriers for CCA. Unlike its predecessor, AB 117 was written with an "opt-out" option, in which electricity consumers within defined boundaries may choose to continue their service with previous IOU. Ultimately, this function allows for a seamless integration of CCA and with it accessible and convenient options for green power. Under this legislation, the CPUC will be tasked with ensuring feasibility, approval, and regulation of CCAs. [5]

In summary, the "opt-in" feature, enacted by AB 1890, allowed electricity customers to sign up and obtain their power from an alternate non-IOU electricity provider if they made the effort to do so. The "opt-out" feature, legislated by AB 117, uninterruptedly switches users electricity provision to the CCA while utilizing the IOU for its delivery infrastructure until the user decides to switch back to the IOU.

Opt In	Opt Out (current)
• AB 1890 • Customer automatically enrolled with **IOU.** • To **choose another non-IOU provider**, customer must actively go find another provider or CCA and sign up with it.	• AB 117 • Customer automatically enrolled with **CCA.** • To **choose to discontinue CCA service and return to previous IOU**, customer must fill out form to resume IOU service.

[5] Lean Energy US, "Community Choice Aggregation," http://www.leanenergyus.org/wp-content/uploads/2013/10/CA-Sample-How-To-For-CCA.pdf.

Further into CCAs legislative landscape, a few bills collectively paved the way to allow these energy programs to be reasonable and beneficial. In 2006, AB 32 set out to reduce California's GHG emissions to 1990 levels by 2020. Couple this with SB 2 that established a stricter Renewable Portfolio Standard, CCA seemed to be a very feasible option to meet the state's progressive environmental goals.[6]

How CCAs Works

In California, in order for CCAs to receive CPUC certification and begin operations, they must follow a specific regulatory process stipulated by AB 117. First, cities and counties must adopt an ordinance to initiate the process. Then, CCAs conduct a feasibility study and submit an implementation plan to the CPUC. According to AB 117 requirements, the implementation plan must include a statement of intent, aggregation process, organizational structure, financing plans, costs and rate-setting, procurement process, CCA participant rights, and a contingency plan for program termination.[7] Once the CPUC approves the CCA and agrees upon a start date, the CCA may begin launch, which frequently takes place in several phases to ensure a smooth transition.[8]

Figure 3: How Community Choice Aggregation Works [9]

After establishing the initial framework, delivering the proper forms, and registering with the CPUC, the electricity procurement process may begin. This can be achieved through the following avenues:

[6] Marin Clean Energy, "Los Altos Staff Report Feasibility Study," March 10, 2015, https://www.mcecleanenergy.org/wp-content/uploads/2016/01/Los-Altos-Staff-Report-on-Feasibility-Study.pdf.
[7] Redwood Coast Energy Authority, "Community Choice Aggregation Implementation Plan," http://www.redwoodenergy.org/images/PDFs/CCA/RCEA-Implementation-Plan-Final_web.pdf
[8] DeShazo, J.R. et al, "The Promises and Challenges of Community Choice Aggregation in California," UCLA Luskin School of Public Affairs, July 2017.
[9] Lean Energy US, "What is CCA," http://www.leanenergyus.org/what-is-cca/.

1. Purchasing wholesale power with a Power Purchase Agreement from large-scale, wholesale plants.
2. Purchasing unbundled Renewable Energy Credits in order to "green" the electricity provider's year-to-year Renewable Portfolio Standard
3. A new and emerging trend is the localization of power within the CCA through construction and development of electricity generating resources.
4. And finally, at the cutting-edge of energy supply, is the horizontal integration of distributed energy resources via virtual power plants, or cloud-based software network of decentralized, medium-scale power generating sources.[10]

The CCA, ultimately, decides the sources of electricity, which allows for a more transparent decision-making process with stakeholders and a better understanding of where our energy comes from.

Now that the energy has been procured, it gets transmitted into the grid and distributed via the legacy utility's infrastructure. The utility is still tasked with metering the usage of the household and maintenance of the transmission and distribution lines. The CCA will do its due diligence in purchasing agreed upon renewable electricity that will essentially "mixed" into the transmission grid. And the interesting thing to note is that electricity is not differentiated once injected into the transmission grid, but rather everyone gets their helping of a greener soup of electrons.[11]

The customer then receives the electricity at a stable generation rate that the CCA has determined with an added delivery charge from the IOU. If the household has solar panels installed, CCAs may still participate in the concept of net metering, in which the CCA will offer the property owner market rates for the excess energy that he or she produces. To date, most CCAs participate in net-metering programs similar to the incumbent IOU's programs.

As CCAs become more widespread and local energy and distributed generation becomes more widespread, there will be a reduction in reliance on long-distance transmission lines. The shift will not only reduce peak loads, but also provide more secure energy. As transmission costs and delivery rates are vulnerable to unpredictable increases, CCAs aim to localize energy generation, specifically in solar power, in order to reduce the need for these transmission lines. Thus, CCAs tend to offer higher net energy metering (NEM) incentives than IOUs and has proven to be quite extensive. From their NEM programs, Marin Clean Energy boasts a 77 MW of solar energy and Sonoma Clean Power currently has 97 MW of capacity. CCAs have prioritized local solar installations in order to meet each territory's increasing demand loads and thus offer advantageous reimbursement rates.

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[10] Community Choice Aggregation 2.0: Strategies for Distributed Energy Resources in CCA Environments, Local Power, Inc., Comptche, California, United States, 2016. http://localpower.com/whitepaperCopyright2011byLocalPowerInc.pdf.

[11] Borenstein, S, "Is 'Community Choice' Electric Supply a Solution or a Problem?" Energy Institute at Haas, February 8, 2016. Web. https://energyathaas.wordpress.com/2016/02/08/is-community-choice-electric-suppy-a-solution-or-a-problem/.

Three Types of CCA Governance

In California, there are a few methods in which CCAs may be managed. Regardless of the governance structure, the CCAs assets and liabilities remain separate from the scope of the municipal and governmental funds and liabilities. The CCA structures are:

1. Joint Powers Authority (JPA): A public, non-profit entity that represents an inter-jurisdictional region of multiple municipalities, such as Marin Clean Energy or Sonoma Clean Power.
2. Enterprise Fund: This model is for single cities or counties, such as the Lancaster Energy Choice.
3. Commercial, Third-Party Management: This structure delegates CCA responsibilities to a privately contracted firm. This nascent structure has not been fully tried and vetted yet.

While the typical JPA model will utilize the CCAs surplus funds to reinvest in community energy projects and programs, the Enterprise Fund and Commercial model may allocate a share of the revenues to the general fund. Typically, CCAs will be governed by a board of directors, council, or commission, in which officials are elected to administrate and make policy decisions. In addition, public meetings will be held regularly in order to engage the community and stakeholders in making decisions regarding the CCA.

Understanding Your CCA Electric Bill: Rates & Costs

Once CCAs have been established, electricity consumers will be primarily concerned with their electricity bill at the end of the month. It is imperative that this bill is understood and framed with the context of sustainability and transparency in mind. Since the goal of establishing a CCA is to open the discussion of electricity procurement to public stakeholders as well as succeed in obtaining renewable energy goals, breaking down the bill into its main components of generation charges by the CCA and delivery charges by the IOU.

At the end of each billing cycle, CCA customers will still receive a bill from their IOU because it still oversees the electricity metering, billing, and customer service for households. A few key charges to take note of are:

- Electric Generation or Supply Charge: The cost for the electricity needed to supply the home or business's energy demand. This replaces the fee that the IOU would charge if it were procuring your energy. Under this charge paid to the CCA, there may be a *renewable energy charge* if the customer opts for a more renewable energy package. This revenue from this charge is usually used to develop more energy-related project or programs. A *utility user tax* may be seen in some cities, which will be charged regardless if you are a CCA or IOU customer. Finally, the California Energy Commission collects the *energy surcharge*.[12]

[12] Marin Clean Energy, "Billing," https://www.mcecleanenergy.org/billing/

- Electric Delivery Charge: The cost of moving or delivering electricity from the grid to the property, as well as maintaining transmission lines. Depending on the regions major IOU, you may see *generation credit*, which is the amount the IOU would have charge for the generation of electricity if the customer is not a part of the CCA. As part of the IOU exit fee or Cost Responsibility Surcharge (CRS), the *Power Charge Indifference Adjustment* or *Transition Charge* is the compensation to the IOU for the major investments in long-term power contracts prior to establishment of the CCA. Additionally, the *Department of Water Resources Bond Charge*, *Energy Cost Recovery Amount*, and *On-going Competition Transition Charges* are part of the CRS.[13] The *transmission charge* is the cost of moving the electricity from the power-generating plant to the service area over high-power lines. The *distribution charge* is the cost of moving the electricity to the customer's property. The *franchise fee* pays for the right to run electricity to homes and businesses through service streets. Some other charges you may see include the nuclear decommissioning charge, conservation incentive adjustment, public purpose programs charge, and new systems generation charge.[14,15]

Transparency and understandability in the each customer's billing statement will be key to the overall success in achieving high participation rates. CCAs strive to deliver affordable, competitive, and stable rates to its participants and so the question becomes whether the delivery charges imparted by the IOU will impact the overall CCA customer retention.

Advantages & Risks

With the growing establishment and discussion of CCAs comes the need to analyze the risks and benefits in hand. More specifically, the main scopes of importance regarding this community-based energy supplier concept are ensuring that it is successful in reducing emissions, lowering costs, and making green power accessible.

Environment

At their core, CCAs are rooted in the movement towards clean energy. With CCAs, consumers are offered the choice of a higher percentage of renewable energy mixed energy portfolio or even 100% renewable energy option. In doing so, cities and counties will be able to drive innovation for local clean and renewable energy projects as well as potentially decrease greenhouse gas emissions. By 2019, the Los Angeles Community Choice Energy (LACCE) estimates a GHG reduction between 289,080 to 505,890 tons CO_2e per year assuming a 50%

[13] Pacific Gas & Electric, ELECTRIC SCHEDULE CCA-CRS: COMMUNITY CHOICE AGGREGATION COST RESPONSIBILITY SURCHARGE," https://www.pge.com/tariffs/tm2/pdf/ELEC_SCHEDS_CCA-CRS.pdf
[14] Cape Light Compact, "Power Supply & Rates," http://www.capelightcompact.org/power-supply/
[15] Lancaster Choice Energy, "Understanding Your Bill," http://www.lancasterchoiceenergy.com/billing-rates/understanding-your-bill/

RPS is reached.[16] Although the natural gas often used to generate power is "less bad" than other sources, the ultimate goal is to divest from fossil fuels and foster a sustainable future for generations to come. Thus, the mission the CCAs aim to achieve ties in neatly with the standard Climate Action Plan goals to reduce GHG emissions and move towards renewable energy. To reach California's target of 50% renewables by 2030 and other climate change goals, CCA is the logical and most effective choice in greening our energy and reducing the community's carbon footprint.

CCAs offer a unique opportunity to Californians in which they can reduce CO_2 emissions and increase savings without any additional investment in reducing electricity consumption. The goal of CCAs is to be able to use a higher amount of renewable energy to provide to their consumers, have control over where their electricity comes from, and ultimately emit less greenhouse gases than their incumbents. In comparison to PG&E, Marin Clean Energy, Sonoma Clean Power, CleanPowerSF, and Peninsula Clean Energy emits 26%, 61%, 30%, and 53% less greenhouse gases, respectively. With existing CCAs paving the way to supply larger portions of renewable energy, the anticipated CCAs launching soon will add to this statewide pursuit of reducing GHG and other air pollutants. Cumulatively, California CCAs have resulted in approximately 590,000 tons CO_2e over the past year. Factoring in the California Cap-and-Trade program's pricing of a metric ton of carbon at $12.73, this emissions reduction equates to over $7.5 million in savings.[17]

Things to consider in assessing the environmental benefits of CCAs are the source of the power as well as the impact of energy generation development projects. There may be some incurred emissions or habitat destruction from construction or development of solar, wind, and other projects. However, cities and communities may have the advantage of using the aggregated consumer electricity usage data in within their operational boundaries to better plan for climate resilience measures.

Economy

The promise of CCAs is to deliver green power at a lower rate in order to make renewable energy more accessible and achieve climate action goals. Existing CCAs have delivered on this process by offering more competitive rates than the respective IOU. The comparison illustrated below is based on an analysis of CCA versus IOU "joint rate comparisons" and "sample rate comparisons" provided by each entity.

[16] EES Consulting, "County of Los Angeles Community Choice Energy: Business Plan," June 30, 2016, http://file.lacounty.gov/SDSInter/green/247381_BoardMotionofSept152016ItemNo6-FinalReport.pdf.
[17] DeShazo, J.R. et al 2017.

Figure 2: Rate Comparison between Marin Clean Energy and PG&E based on a monthly consumption of 445 kWh on a residential E-1 rate as of April 1, 2017 [18]

Figure 3: Rate Comparison between Sonoma Clean Power and PG&E based on a monthly consumption of 536 kWh on a residential E-1 rate as of March 1, 2017 [19]

[18] Marin Clean Energy, "Sample Residential Cost Comparison,"April 1, 2017, https://www.mcecleanenergy.org/rates/.

[19] Pacific Gas & Electric, "PG&E – SCP Joint Rate Comparison," March 1, 2017, https://www.pge.com/includes/docs/pdfs/myhome/customerservice/energychoice/communitychoiceaggregation/scp_rateclasscomparison.pdf

Figure 4: Rate Comparison between Lancaster Choice Energy and SCE based on a monthly consumption of 676 kWh on a residential Domestic/D rate as of June 1, 2017 [20]

Figure 5: Rate Comparison between Clean Power SF and PG&E based on a monthly consumption of 280 kWh on a residential E-1 rate as of July 1, 2017 [21]

[20] Lancaster Choice Energy, "SCE – LCE Joint Rate Comparison," June 1, 2017, http://www.lancasterchoiceenergy.com/billing-rates/residential-rates/.
[21] CleanPowerSF, "Residential Rates," July 1, 2017, http://sfwater.org/index.aspx?page=993.

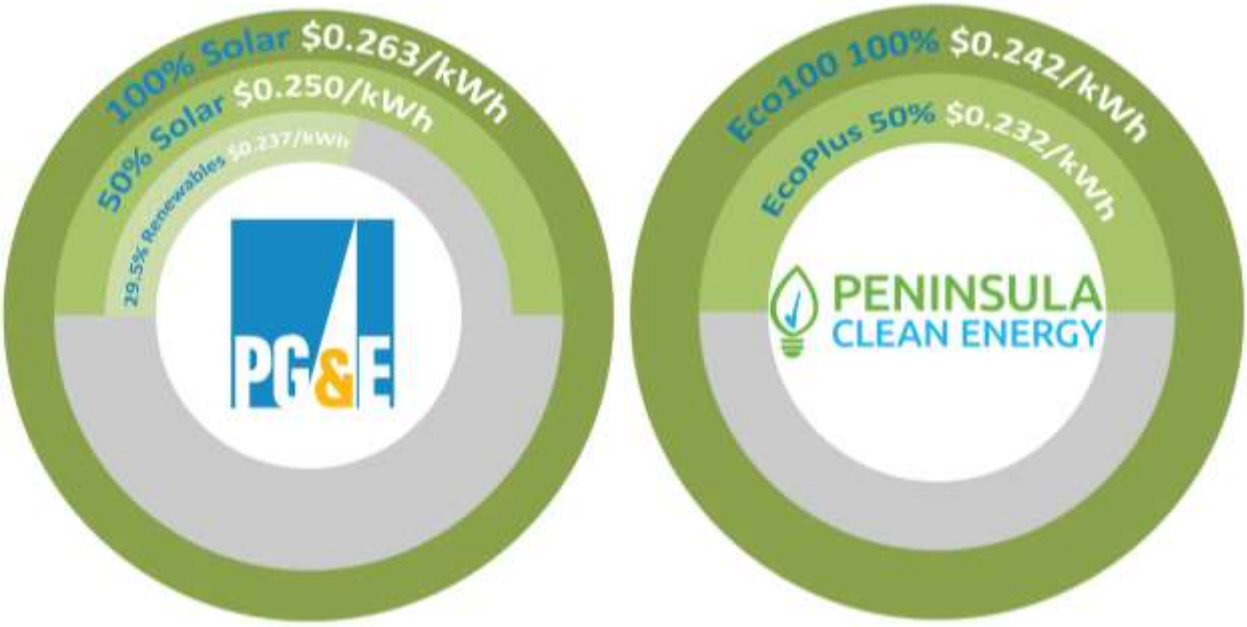

Figure 6: Rate Comparison between Peninsula Clean Energy and PG&E based on a monthly consumption of 423 kWh on a residential E-1 rate as of March 15, 2017 [22]

Figure 7: Rate Comparison between Redwood Coast Energy Authority and PG&E based on a monthly consumption of 500 kWh on a residential E-1 rate as of March 1, 2017 [23]

[22] Peninsula Clean Energy, "PGE – PCE Joint Rate Comparison," March 15, 2017, https://www.peninsulacleanenergy.com/wp-content/uploads/2016/07/PCE_rate-June-2017.pdf
[23] Redwood Coast Energy Authority, "Sample Residential Cost Comparison," March 1, 2017, http://cce.redwoodenergy.org/residential/rates-residential-customers.

Figure 8: Rate Comparison between Silicon Valley Clean Energy and PG&E based on a monthly consumption of 500 kWh on a residential E-1 rate as of April 1, 2017 [24]

Figure 9: Rate Comparison between Apple Valley Choice Energy and SCE based on a monthly consumption of 716 kWh on a residential Domestic/D rate as of June 1, 2017 [25]

Due to CCAs flexibility in procuring more affordable renewable energy, these entities are able to provide their electricity consumers clean energy at lower rates. CCAs have the capability of

[24] Silicon Valley Clean Energy, "Sample Residential Cost Comparison," April 1, 2017, https://www.svcleanenergy.org/residential-rates.

[25] Apple Valley Choice Energy, "Joint Rate Comparison," June 1, 2017, https://avchoiceenergy.com/wp-content/uploads/2017/07/joint-rates-2017-06.pdf.

negotiating low-cost electricity generation contracts due to the recently decreased cost of generating renewables since the renewable portfolio standard was initially implemented. IOUs may still have ongoing, expensive, long-term contracts that will drive up its electricity procurement costs. This trade-off allows CCAs to offer lower rates for clean energy generation to compensate for applied exit fees. Also, CCAs do not have to pay premiums to shareholders.

Long-term contracts often are quite involved and stipulate the construction of electricity generation plants. While, short-term contracts are more dynamic and generally purchase low-cost energy surplus. Another important contributing factor affecting rates is the acquisition of unbundled renewable energy certificates (REC) to comply with renewables portfolio standards. However, California CCAs operating in 2016 have used either no Category 3 RECs or an amount compliant with the renewable portfolio standard. CCAs in early phases of establishment, such as LACCE and Redwood Coast Energy Authority, have specified in their business plans and feasibility studies that they do not plan to use any Category 3 RECs.[26]

CCAs may benefit the community's economy in more ways than just lowering electricity consumer's bills and offering rate stability. As mentioned previously, the CCAs budget is distinct from the municipalities' general funds and thus the surplus finances flows back into the community in the form of energy efficiency programs and projects. In addition, CCA formations may offer a flux of green job creation.

Although CCAs have some great advantages, there are a number of factors to consider, such as the upfront costs of starting a CCA, and potentially higher rates due to PCIA or exit fees and procurement costs. There is still rate instability and uncertainty due to the volatility of PCIA fees. Factoring into this, CCAs may jeopardize IOUs' major investments in long-term power contracts.

Community

By localizing energy control, the community will be able interact more directly with its energy provider and reap the benefits of increased local engagement. CCAs allow the community access to the decision-making process, often in the form of public hearings. The smaller territory covered by the CCA allows for more focus in effectively addressing the local community's needs and concerns.

Further, CCAs provide transparency in the electricity procurement process, giving the community a chance to understand where their energy is coming from. By making renewable energy more accessible and affordable, CCAs provide a unique opportunity for those who do not have the financial capacity to obtain or install clean energy resources to do so through offering renewable energy packages. As mentioned before, CCAs return excess funds back to the community in the form of public benefit and energy efficiency programs. Some notable examples include the transportation electrification programs, such as MCE's SmartCharge

[26] DeShazo, J.R. et al 2017.

program or SCP's Drive Evergreen, in order to improve local air quality. In addition, CCAs have provided energy efficiency programs and audits to low income customers as well as access to install solar panels.

Case Study: Marin Clean Energy

Marin Clean Energy (MCE) became the first CCA entity in California. In 2002, California AB 117 opened the doors for local energy control, which was instrumental to the launch of MCE. Recognizing this unique opportunity to combat GHG emissions, Rebekah Collins, co-Founder of Sustainable Fairfax, raised awareness about this CCA concept amongst the Marin County Board of Supervisors, Fairfax Town Council, and many local leaders and grassroots organizations. In 2008, MCE established itself and began planning and organization. With the help of the innovative community and local leaders, MCE launched in May 2010 and began service to its many territories as a local government agency with a board of elected officials. Its mission is to address climate change by providing clean energy options to its community.

Today, MCE serves cities in Marin and Napa County and the cities of Richmond, Benicia, El Cerrito, San Pablo, Walnut Creek, and Lafayette. It is also anticipated to service Contra Costa County in the coming year. MCE provides electricity to a number of sectors, including single-family and multi-family residential, industrial, agricultural, and commercial. Its residential segment has proven very successful and constitutes a total of 272,982 accounts, representing nearly 90% of all ratepayers in its service territory.[27]

MCE aims to combat climate change by offering affordable renewable energy packages to its customers. Instead of the former default PG&E service offering only 30% renewables, MCE's Light Green default service offers its customers a 50% renewable portfolio. In addition, MCE offers a Deep Green option of 100% renewables from wind and solar energy as well as a Local Sol option for 100% locally-produced solar. The Local Sol option is sourced from Cooley Quarry, a single solar project in Novato, CA, and has a fixed rate price premium of $0.142/kWh. Due to the size of the solar generation site, it has the capacity to service approximately 300 customers and has been doing so since July of 2017.

Table 2: MCE – PG&E Rate Comparison [28]

PG&E (Opt Out)	MCE Light Green	MCE Deep Green	MCE Local Sol
33% renewable energy	**50%** renewable energy	**100%** renewable energy	**100%** locally-produced solar
$54.25 PG&E Electric Delivery	$54.25 PG&E Electric Delivery	$54.25 PG&E Electric Delivery	$54.25 PG&E Electric Delivery
$43.78	$30.26	$34.71	$63.19

[27] Marin Clean Energy, " Marin Clean Energy: Energy Efficiency Business Plan," January 2017, https://www.mcecleanenergy.org/wp-content/uploads/2017/01/EE-BusinessPlan2017_20160105_filing.pdf.
[28] Marin Clean Energy, "MCE-PG&E Joint Rate Comparison," April 2017. *Based on a typical usage of 445 kWh at current PG&E rates and MCE rates effective as of April 1, 2017 under the E-1 rate schedule from MCE website.

Electric Generation	Electric Generation	Electric Generation	Electric Generation
-	$13.25	$13.25	$13.25
Additional PG&E Fees	Additional PG&E Fees	Additional PG&E Fees	Additional PG&E Fees
$98.03	**$97.76**	**$102.21**	**$130.69**
avg. total cost	avg. total cost	avg. total cost	avg. total cost

In a side-by-side comparison, MCE can provide 17% more renewable energy than the incumbent IOU at a lower total cost, saving customers money on their electricity bill and ensuring that they are reducing their overall GHG emissions. MCE offers 100% renewable energy packages as a cost-effective way to greening the community's households and businesses. As seen in Table 2, based on a typical residential usage of 445 kWh, customers can obtain a 100% renewable energy supply for $4.18 more or 100% locally-produced solar supply for $32.66 more. MCE utility costs include the additional PCIA fees imposed in order to circumvent PG&E's long-term power investments, but MCE rates are expected to be more stable long-term and offset these additional fees.

MCE ensures that its customers have the choice to contribute more renewable energy to the grid. Currently, MCE is divesting from fossil fuel sources and procuring energy from clean sources, such as solar, wind, geothermal, biogas, and small hydroelectric. MCE reports that its Light Green option originates from a mixture of energy sources, 36% from wind, 5% from solar, 4% from small hydroelectric, 2% from geothermal, 5% from biogas, and the remaining 48% from large hydroelectric, natural gas, and other unspecified sources. The Deep Green option comprises of 25% solar energy and 75% wind energy. As mentioned previously, the Novato Cooley Quarry powers 100% of the Local Sol option.[29]

Figure 4: Marin Clean Energy's New Renewable Energy Projects [30]

[29] Marin Clean Energy, " Power Content Label," http://energy.ca.gov/pcl/labels/2015_labels/Marin_Clean_Energy_(MCE).pdf.
[30] Marin Clean Energy, "Together We're Building a Cleaner Energy Future for California: 2016," https://www.mcecleanenergy.org/wp-content/uploads/2016/12/MCE-New-California-Renewable-Projects-Overview_12-9-16.pdf.

MCE has demonstrated its commitment to providing as much clean energy to its users as possible by working with its partners to commit over $1.6 billion to build 813 MW of new renewable energy projects in California. This large investment in renewable energy projects has created over 2,800 green jobs in California. As promised, MCE has 19 MW of local renewable energy projects currently operational or underway, including many projects developed under MCE's Feed-In Tariff program such as the Novato Cooley Quarry, Freethy Industrial Park, and Cost Plus Plaza Larkspur, and San Rafael Airport Solar.

Exceeding its climate protection goals, MCE has successfully eliminated 185,751 metric tons of GHG emissions in the years 2010-2015. MCE continues to deliver on its promise by allocating $75,000 for low income solar rebates since 2012. Additionally, through MCE's ambitious energy efficiency programs, 7,765,057 gallons of water have been saved. MCE has proven the success of the CCA concept and been a model example of CCAs' many environmental and financial benefits.

Currently in California: LACCE

Looking forward, many more cities and counties across California are exploring the idea of establishing CCAs. Los Angeles Community Choice Energy is the CCA program that is anticipated to service the Los Angeles County, accounting for 82 cities and may well be the largest CCA in California. Although LACCE could operate within the County's existing governance, it will form as a JPA to offer a more flexible infrastructure. The proposed service area's average annual energy usage is 3,000 aMW and 7,000 MW peak. Thus, LACCE plans to initiate service in 3 phases: Phase 1 will begin servicing the County's municipal facilities in the unincorporated areas in January 2018. Then, Phase 2 will begin servicing the county's commercial and industrial accounts in July 2018. Finally, Phase 3 will service all customers in the County's no later than January 2019. LACCE projects that by the end of Phase 2, it will be serving over 300,000 customers, with over 3,800 GWh in annual electricity sales, and generate approximately $180 million in revenue.

Prospectively, LACCE plans to offer an RPS Bundled package with an equivalent 28% renewable energy as SCE, 50% Green Bundled rate, and 100% Green Bundled Rate. The tentative rate comparison below details LACCE's and SCE's rates at a residential rate class. Default service for both electricity providers will be the 28% renewable rate. However, LACCE's 50% renewable rate will offer 22% more clean energy at a cost 4.1% lower than SCE's default package.

Table 3: LACCE – SCE Rate Comparison

SCE Bundled Rate	LACCE RPS Bundled Rate	LACCE 50% Green Bundled Rate	LACCE 100% Green Bundled Rate
28% Renewables	28% Renewables	50% Renewables	100% Renewables
$0.171/kWh	$0.162/kWh	$0.164/kWh	$0.182/kWh

LACCE also aim to deliver more clean energy to its customers than SCE, on track to target 50% renewable power by the end of 2017 from the wholesale market and newly constructed renewable resources. If this target is achieved at start-up, LACCE's operations will have a GHG emissions reduction range from 289,080 to 505,890 tons CO_2e annually by 2019. Not only this but LACCE will be able to increase investments into local energy efficiency programs and activities to further reduce the GHG emissions. In addition, LACCE anticipates that it will spur the local economy by create 1,500 jobs during the construction of a 50 MW solar project, along with many other renewable energy projects. LACCE estimates a $20 million rate savings across the county.[31]

Currently, LACCE is in preparation of launching Phase 1 of operation. However, there are a few other CCA options available to the Los Angeles region that are being considered as well, including the California Choice Energy Authority, South Bay Energy Coalition, or cities may go independent. In April 2017, LACCE's JPA, enabling ordinance, $10 million in start-up funding, and program plan was approved. Now, LACCE urges cities to evaluate their CCA options, adopt the enabling ordinance and JPA agreement, appoint a Board Director, consider its constituent's services and programs, and support LACCE in public outreach.[32] LACCE's initial participants will be finalized by the end of this year.

Conclusion

CCAs have emerged and proven successful in providing lower electricity rates to their customers as well as giving electricity consumers options to green the grid. As the need to reduce GHG emissions becomes more and more necessary, CCAs offer a unique option to cities and counties to take local control over energy. In attempt to meet California's ambitious climate change goals, many cities and counties will soon begin the planning phase or anticipating the launch of its new CCA, such as Los Angeles County. Other regions, such as San Diego and the Orange County region are exploring the idea of CCA.

To keep electricity consumers informed about the on-goings of these new developments, community members may receive notices from their local CCA or attend public hearings to be informed and engaged about their potentially new electricity provider. Similarly, community members who live in a service area covered by an operational CCA may want to explore the different clean energy options and learn more about net metering from their local CCA.

[31] Green LA County, " County of Los Angeles Community Choice Energy (LACCE) Business Plan," July 2016, http://file.lacounty.gov/SDSInter/green/247381_BoardMotionofSept152016ItemNo6-FinalReport.pdf.
[32] City of Calabasas, " LACCE," http://www.cityofcalabasas.com/pdf/agendas/council/2017/052417/item8-attachment-3.pdf.