# ‘Greening’ the Mix through Community Choice

## TOWARD A 100% RENEWABLE ENERGY LOS ANGELES

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## EXECUTIVE SUMMARY

Across much of the United States, the utility-based model of energy management that has dominated for over a century is facing unprecedented disruption. Community Choice Aggregation (CCA) is an energy supply model whereby local governments combine their energy loads and make the choice to purchase energy independently instead of from a utility. The model has emerged as a serious alternative to the prevailing model of energy governance in numerous states, particularly in California where CCAs are projected to account for as much as 60% of California's electricity load by 2020 (CCP 2016).

CCA allows local governments to set their own renewable energy targets and potentially deliver a greater range of renewable energy to their customers than would be provided by a traditional utility. This report assesses the potential of the CCA model to contribute to the UCLA Sustainable Los Angeles Grand Challenge goal of powering 100% of local energy and transportation needs (including all cars, trucks, buses, rail, aircrafts, buildings, industry, and other sources that consume energy within County borders) with cleaner, renewable energy resources by 2050. Through a critical assessment of the CCA model as it has been applied in California, this report outlines the opportunities and benefits of this innovation in energy governance and service delivery, while also identifying some unexpected adverse consequences that the adoption of such an approach may entail.

Despite broadly consistent objectives, this study finds considerable variability in the implementation of renewable energy procurement strategies among California's three most-established CCAs. CCAs' ability to pursue procurement objectives is found to be constrained in early years of operation by lack of credit rating, as well as challenges in balancing renewable energy targets with other potentially competing objectives such as lowering electricity rates for consumers while promoting local economic development. While immediate issues around access to capital appear to be resolved as CCAs mature, ongoing policy uncertainty regarding cost allocation between utility and CCA customers raises some serious concerns about the model's viability in the longer term. The specific impact CCAs will have on the future development of California's renewable energy resource potential – including the type, size and location of generation – also remains to be seen.

The report serves as an empirical and theoretical basis from which policymakers across the LA region, the state and the nation can draw to ensure future renewable energy targets are met in a way that maximizes sometimes competing, social, economic, and environmental objectives.

# 1. Introduction

The United States is going through dramatic changes in energy generation and governance, with different trends emerging in different states. These changes have substantial implications for energy governance regimes, that can be public, private, or combinations of both, and for the nation's low-carbon energy future.

Long-dominated by large utilities, recent years have seen a gradual fragmentation of the utility sector and an increasing number of smaller, county or municipally-based quasi-utilities asserting local control over energy procurement and delivery. Community Choice Aggregation, or CCA, places decisions around energy procurement and delivery in the hands of the local community, and is thus viewed by a growing number of local governments as an attractive alternative to the utility model. The CCA model allows cities and counties, or collections of cities and counties, to combine the electricity demand of customers in their jurisdictions and procure electricity for these customers, either through their own generation or through the market (Faulkner 2010). Localized control over energy procurement and delivery is intended to better meet the needs of the local community than would a corporate utility. If the local government chooses to do so, CCA allows local governments to set their own renewable energy targets and potentially deliver a greater range of renewable energy to their customers than would be provided by a traditional utility.

While the purported benefits of CCAs include lower rates and opportunities for local economic development, in California CCAs have been promoted overwhelmingly on their ability to provide a greater share of renewable energy to their customers than has been provided by the incumbent utilities. A cursory comparison of CCA and utility power content labels supports this claim, indicating the share of renewable energy provided by the three largest investor-owned utilities Southern California Edison (SCE), Pacific Gas & Electric (PG&E) and San Diego Gas & Electric (SDG&E) ranges from 25% to 35%, while power mix options offered by the three existing CCAs range from 35% to 100% (Appendices A & B).

Measuring the effectiveness of the CCA model based on share of renewables alone, however, neglects key aspects of energy procurement that are crucial to maximizing the social, economic, and environmental benefits of this innovation in energy governance. As more and more of California's existing renewable energy generation capacity becomes locked in long-term contracts, meeting ambitious renewable energy targets will require policy innovations and interventions that not only promote the procurement of renewable energy resources, but that also encourage the development and construction of additional renewable energy generating capacity. As such, in addition to the sheer quantity of renewable energy procured, the type, size, and location of generation facilities are each of equal, if not greater, importance.

In April 2017, the Los Angeles County Board of Supervisors approved a county-wide CCA program, which, when fully implemented, may serve some 1.1 million customers. Through a critical assessment CCA energy procurement strategies in California, this report outlines opportunities and potential pitfalls of the CCA model in terms of its potential to meet the UCLA Sustainable Los Angeles Grand Challenge goal of powering 100% of local energy and transportation needs (including all cars, trucks, buses, rail, aircrafts, buildings, industry, and other sources that consume energy within County borders) with cleaner, renewable energy resources by 2050. LA County accounts for over 20% of statewide greenhouse gas emissions (IoES 2015), and thus powering 100% of local energy and transportation needs with cleaner, renewable energy resources is viewed as crucial step in achieving county- and state-level greenhouse gas emissions reductions targets.

This report is structured as follows. Following an overview of the methods and limitations of the study (Section 2), Section 3 provides an overview of the CCA experience in California to date. Section 4 explores a number of broad factors shaping CCA procurement approaches, including the policy context, approaches to CCA governance and operations, and access to capital. Section 5 presents a detailed analysis of the procurement strategies of three CCAs operating in California as of June 2016: Marin Clean Energy (MCE), Sonoma Clean Power (SCP) and Lancaster Choice Energy (LCE), comparing each of these strategies to those of the respective associated utility. Section 6 identifies several future trends and challenges facing CCAs, and Section 7 concludes.

## 2. Methodology and Limitations

This report addresses the following three questions/issues in the context of operational CCAs and their potential for meeting the UCLA Sustainable LA Grand Challenge goal:

1. To what extent have CCA's been able to provide renewable energy options to their customers (program options, but also renewables as portion of total load)?
2. What types, location and vintage of generation sources have CCAs utilized in order to meet renewable energy delivery objectives?
3. What have been the major barriers to renewable energy procurement?

This report draws primarily on CCA energy procurement data provided through the California Energy Commission's Power Content Label program. Due to reporting deadlines, detailed procurement analysis is limited to those CCAs that have formally submitted Power Content Label reports to the California Energy Commission as of January 2017 – namely, Marin Clean Energy (MCE), Sonoma Clean Power (SCP), and Lancaster Choice Energy (LCE). While reliance on the Power Content Label reporting limits the breadth of the analysis, this historical data is considered a more accurate

indicator of CCA procurement than forecasts contained in CCA integrated resource plans. Quantitative procurement data is supplemented with qualitative data obtained through a variety of policy documents, including California state legislation, California Public Utilities Commission (CPUC) decisions, and CCA implementation and integrated resource plans, interviews with and public comments made by CCA and utility representatives and local and state government officials.

The limited number of cases which are available for analysis represents a major limitation of this study. In addition, each of the three CCAs are at very different stages of development, with MCE, SCP and LCE established in 2010, 2014 and 2015, respectively. This not only makes it difficult to compare across CCAs, but also limits the potential for meaningful comparison with investor-owned and publicly-owned utilities, which, as well-established entities, vary greatly in their customer bases, broader political clout, and ability to negotiate favorable procurement contracts and finance arrangements. This study thus is intended as a preliminary assessment, providing a baseline analysis which can be built upon in future years as the presence of mature CCAs expands across the state.

## 3. CCAs in California: An Overview

Community choice aggregation (CCA), also known as community choice energy (CCE), has emerged as one the most hotly contested developments in electricity governance in recent years. For the better part of a century, Californians have received their electricity from either investor owned utilities (e.g. PG&E, SCE & SDG&E) or publicly owned utilities (e.g. LADWP). While earlier attempts to promote competition in the California electricity market were suspended in the wake of the energy crisis of 2000-01, the concept of consumer choice has once again come to the fore.

CCA is an energy supply model whereby local governments combine their energy loads and make the choice to purchase energy independently instead of from a utility, allowing local governments to set their own renewable energy targets and potentially deliver a greater range of renewable energy to their customers than would be provided by a traditional utility. CCA currently exists by law in seven states— Illinois, Massachusetts, New York, New Jersey, Ohio, Rhode Island, and California—and a number of other states are currently considering enacting CCA laws. There are currently five CCAs operating in California: Marin Clean Energy (est. 2010), serving Marin County, Napa County, and surrounding cities; Sonoma Clean Power (est. 2014), serving Sonoma and Mendocino Counties; Lancaster Choice Energy (est. 2015), serving the City of Lancaster in Los Angeles County; CleanPowerSF, (est. 2016), serving the City and County of San Francisco; and Peninsula Clean Energy (est. 2016), serving San Mateo County and eligible cities within the county. A further 10 CCAs are anticipated to launch in 2017-18, and an

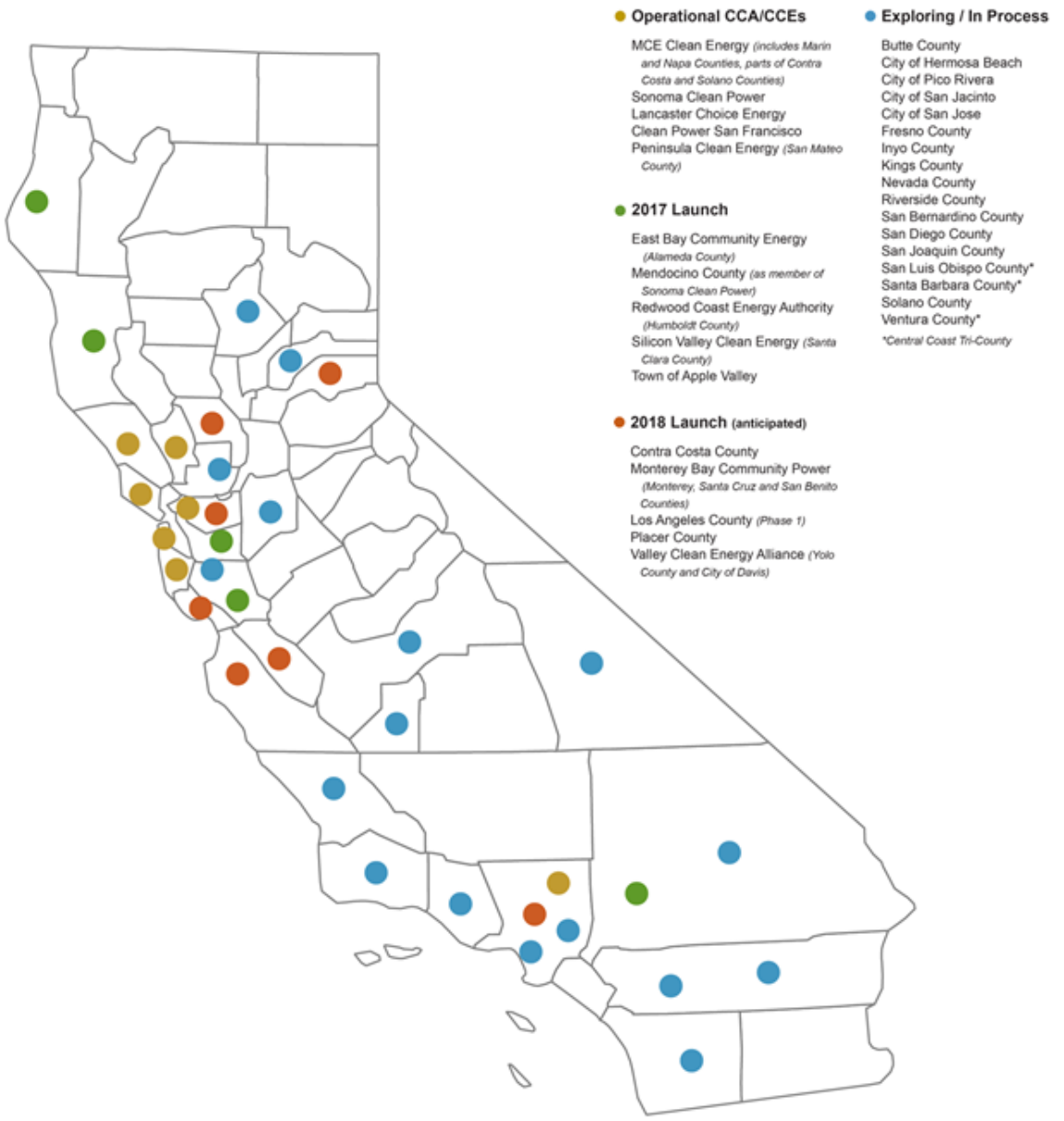


**Figure 1 California CCAs Source: www.leanenergy.org**

additional 17 local governments are in the exploration phase (Fig. 1). According to some estimates, CCAs could account for 60% of California's electricity load by 2020 (CCP 2016).

The rapid growth of CCAs in recent years has been attributed to both the appeal of local control over power mix and rates, as well as proof of concept that now exists in mature and expanding CCAs (Casazza 2017). While all five of the CCAs currently operating in California offer their customers the option of 100% renewable electricity, the delivery of clean and renewable energy is but one of a multitude of objectives a may be striving to achieve. Commonly cited benefits of aggregation include increased local

control over electricity rates, possible savings to the customer, and local economic development through an increase in local generation (Faulkner 2010). As the experience in California has shown, however, social, political and economic variation across CCA contexts may result in the pursuit of divergent objectives, each with differing consequences for renewable energy generation and delivery.

# 4. CCA Energy Procurement

Energy procurement represents a core function of the CCA model, as it is through procurement decisions that a CCA can meet broader objectives such as providing a greater share of renewable energy, decreased greenhouse gas emissions, lower energy costs or local economic development. While procurement decisions are driven largely by the specific objectives a CCA may be wishing to pursue, CCA's ability to procure the resources necessary to achieve these objectives is shaped and often constrained by three broad factors: 1) the energy and climate policy landscape; 2) the choice of governance structure; and 3) access to capital.

## 4.1 Policy context

Assembly Bill 117, passed in 2002, provided the legal authority for CCA communities to set rates for their customers and choose the form of energy generation. By enabling communities to choose renewable energy sources rather than the local utility's mix of energy sources, AB 117 paved the way for the current wave of 'consumer choice'.

Since 2002, IOUs and CCAs have been engaged in an at times heated battle to shape the legislative and regulatory landscape in alignment with their respective political interests. Proposition 16 (2010), which would have required a two-thirds supermajority voter approval before local governments could use public funds or issue bonds to establish or expand public electricity service or community choice aggregation, failed to garner widespread support. In 2011, SB 790 created a code of conduct that utilities must adhere to, and prohibited utilities from marketing against CCAs except through a separate marketing division. In 2014, AB 2145, a bill that would have required potential CCA customers to opt in to the program, as opposed to automatic enrollment with the option to opt out, was soundly defeated.

With the exception of the Renewable Portfolio Standard (RPS), which requires all load-serving entities including IOUs and CCAs to procure at least 33% of total procurement from eligible renewable energy sources by 2020, the policy landscape in California is currently plagued by a number of inconsistencies in terms of the ways in which CCAs and IOUs/POUs are regulated. While SB 790 prohibits IOUs from marketing against CCAs, the bill contains no provision prohibiting CCAs from marketing against IOUs. In addition, while all IOU long-term procurement plans are subject to CPUC approval,

CCA procurement plans are not. Recent efforts to address these inconsistencies, including proposed provisions under SB 618 requiring CCAs to obtain CPUC approval for local energy procurement plans, have been fiercely resisted by CCA advocate groups and failed to gather sufficient support in the California legislature (Hastings 2017).

A major challenge with the CCA model – in which CCAs assume responsibility for electricity procurement, yet responsibility for transmission and distribution remains with the incumbent utility – is that CCAs remain inextricably linked to the utilities from which they have acquired customer load. The inseparability between incumbent utilities and CCAs has led to sustained tensions, as well as increasing uncertainty in lieu of clear direction from the California Public Utilities Commission, around the means through which generation, transmission and distribution costs should be shared between the respective entities.

The root of this tension lies in the rapid decline in renewable energy costs since the early 2000s, which now allows for much more favorable contracts for CCAs looking to procure renewable energy than were available to IOUs during the initial years of California's renewable portfolio standard. IOUs contend that as late entrants on the utility landscape, CCAs have been able to fully enjoy the benefits of low-cost renewables, particularly solar. IOUs and established MOUs, on the other hand, remain locked into contracts signed 5, 10 or 15 years ago when renewable electricity prices greatly exceeded those seen today.

The cost discrepancy between older and more recent contracts has informed multiple efforts, dating back to the CCA enabling legislation, intended to shield monopoly utility ratepayers from bearing the cost of contracts that become stranded because of customer departure from IOUs to CCAs. AB 117 contains specific provisions to impose a cost-recovery mechanism on community choice aggregators "to prevent a shifting of costs to an electrical corporation's bundled customers". The current mechanism, the power charge indifference adjustment or PCIA[1], allows an investor-owned utility to charge a customer an "exit fee" for the cost of buying energy on that customer's behalf when that customer ends its service. The rationale behind the PCIA, set out in SB 350, is to "ensure that bundled retail customers of an electrical corporation do not experience any cost increases due to retail customers of an electrical corporation electing to receive service from other providers". In this way, the PCIA is intended to maintain bundled customer indifference by ensuring that above-market costs associated with prior resource commitments are not shifted from departing load customers to the utility's bundled customers (Wong 2016). Under AB 117, energy contract costs are only recoverable through the PCIA if these costs are "unavoidable" and "attributable" to the

[1] For a full discussion of the PCIA, including various stakeholder perspectives on current limitations and proposed alternatives, see SCE 2017, *Final Report of the PCIA Working Group*

customer. To date, however, the CPUC has not prevented PCIA cost recovery at any time, suggesting specific definitions of these terms are yet to be tested (Gattaciecca, DeShazo, and Trumbull 2017).

In its current form, the PCIA is viewed as unsatisfactory by both CCAs and IOUs. CCAs complain of uncertainty around rate-setting due to 'unstable, unpredictable and rising PCIA charges' (CACE 2016). Such instability is illustrated by PCIA charges paid by Marin Clean Energy customers, which amounted to $12.9m in 2014, $19.3m in 2015 and were projected to total $30.6m in 2016 (Swaroop 2015). IOUs, on the other hand, argue that current means of calculating the PCIA mean that cost increases associated with departing load are ultimately passed on to bundled service customers (SCE, PG&E, and SDG&E 2017). In 2016, the Sonoma Clean Power Authority and Southern California Edison led a six-month effort involving IOUs, CCAs and other interested parties to improve transparency, certainty and data access related to PCIA calculation. Potential implications arising from this process, including proposed alternatives to the PCIA, are discussed in Section 6.

## 4.2 Governance and access to capital

CCAs can be formed and operated under one of three governance structures. The most common structure in California is the Joint Powers Authority (JPA) model, under which member municipalities agree to establish an independent public agency tasked with operating the CCA on their behalf. Single jurisdictions establishing a CCA may do so through an 'enterprise fund', which allows for the CCA to be managed as a separate program/fund within existing municipal operations. Under the single jurisdiction model, which has been employed by Lancaster Choice Energy and Clean Power SF, the municipality retains full program autonomy and all revenue. The third approach, under which municipalities enlist the services of a commercial third party to manage CCA operations, has not yet been implemented in California.

Early CCA feasibility studies argued that CCA's faced a major advantage over IOUs due to their ability to access low-cost capital (CEC 2009), yet the experience of CCAs in California casts serious doubt on this assumption. Both the JPA and Enterprise Fund approaches create a degree of separation between the future liabilities of the CCA and the assets of its member cities and towns. Separating the CCA from the finances of the affiliated municipalities is considered 'best practice' (Table 1), as it protects municipal finances in the wake of potential CCA bankruptcy. A drawback of this fiscal separation is that CCA commence operations with no credit and limited collateral, and are thus reliant on member cities to provide loans or loan guarantees until the CCA can establish an agency credit rating, which typically occurs five years from the commencement of operations (SCP 2015).

| Best Practices of CCAs Operating in California |
|---|
| • Serve community identified goals and local policy objectives, including greenhouse gas reductions and increased renewable energy supply<br>• Protect, engage, and empower vulnerable and disadvantaged sectors of the community through universal residential service, rate protections, transparent and culturally appropriate outreach, and programs designed to create economic opportunities and increase savings for low income customers<br>• Control and safeguard customer revenues to ensure long-term financial viability and local government ownership, even when power supply costs fluctuate<br>• Offer competitive rates and choice in customer electricity services<br>• Plan for long-term financial viability through integrated resource planning, in-house fiscal management, transparent rate setting, and policies that build program reserves<br>• Maintain a firewall between the assets and liabilities of the CCA program and those of municipal general funds<br>• Incorporate long-term power procurement strategies and local power ownership to hedge risk while using a diversity of energy suppliers, technologies and products<br>• Implement effective risk management practices<br>• Adhere to all applicable statutory and regulatory compliance requirements<br>• Engage meaningfully with the community and provide responsive, equitable service<br>• Ensure transparency and accountability to the community and oversight agencies<br>• Build community capacity by offering complementary programs that serve community interests, such as energy efficiency, demand response, community solar, advantageous net energy metering, Feed-in Tariffs, local workforce development, EV charging and battery storage |

**Table 1 Best Practices of CCAs Operating in California (CalCCA 2017)**

Lack of credit history has had direct implications for CCA procurement strategies, particularly in the early years. Newly established CCAs are typically initially reliant on the services of a third-party power provider, who can use their own credit to enter into PPAs directly and then pass this electricity on to the CCA. While the use of third-party providers allows for the CCA to meet immediate needs in the short-term, the approach results in a level of opacity when seeking to identify specific generation sources. In the power content label, the primary means through which electricity providers

communicate details of their energy mix to consumers, electricity purchased through a third-party provider is listed as 'unspecified sources of power'. Most importantly, however, as will be shown in the following case studies, a lack of credit greatly hinders a CCA's ability to enter competitive power purchase agreements (PPAs). In some cases, perceived risk associated with a lack of credit history has made lenders reluctant to finance projects in which a CCA will be the primary energy purchaser. Where lenders have been willing to finance such projects, perceived risk is often hedged through a premium on the contract price, making CCAs less competitive than incumbent utilities.

# 5. Case Studies

## 5.1 Marin Clean Energy

Marin Clean Energy (MCE) launched in May of 2010, becoming California's first community choice aggregator. MCE is governed by Marin Energy Authority, a joint powers authority established in 2008 to develop and manage energy and energy-related climate change programs, including the CCA program (MEA 2009). Since its inception, MCE has grown to include 24 local governments and now serves approximately 255,000 customers (MCE 2017).

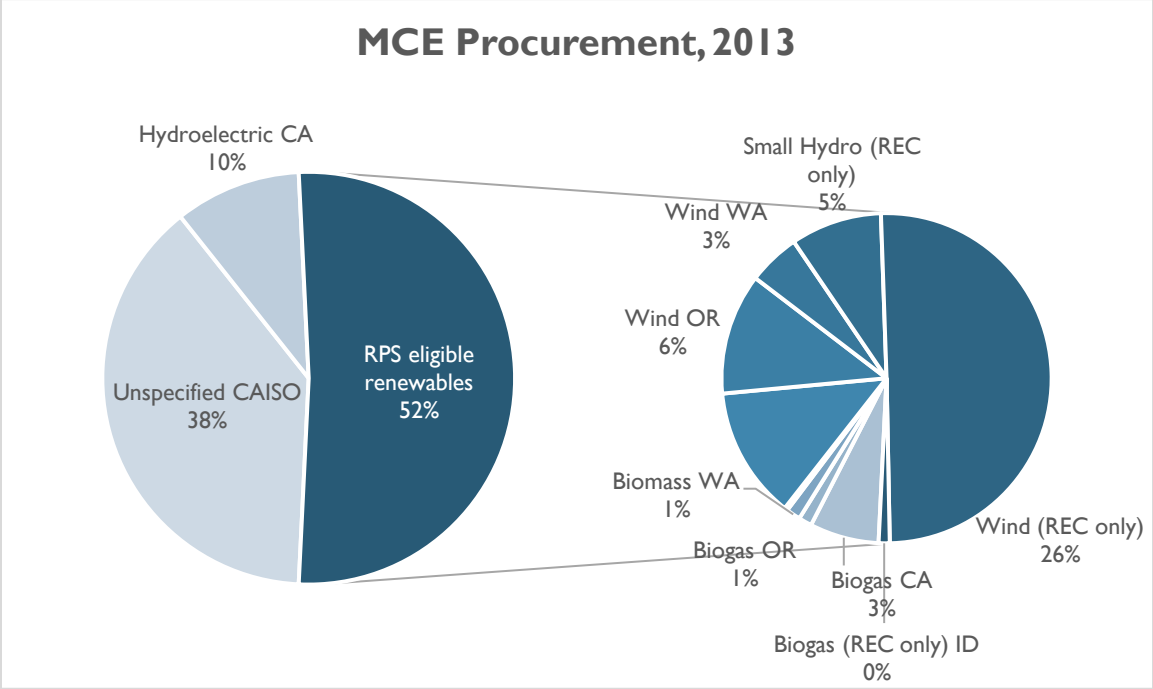


**Figure 2 MCE 2013 procurement by state and fuel type; 1,110.49 GWh**

As the first CCA to commence operations in California, MCE faced considerable procurement challenges in early years of operations. MCE's JPA governance structure meant that the entity had no credit rating, and was thus unable to access the types of low-cost long-term contracts available to incumbent utilities. During its initial years of

operation, MCE procured the bulk of its non-renewable load through third-party provider Shell Energy North America (SENA). The SENA agreement covered all of MCE's initial resource requirements until the commencement of energy deliveries from other contracts.

While MCE's default resource mix in 2013 comprised 52% eligible renewable energy sources, more than half of these sources consisted of Green-e Energy certified renewable energy certificate (REC) purchases tied to small hydro and wind projects in Oregon, Washington, Wyoming and Idaho. These so-called 'unbundled' RECs – whereby the legal right to the environmental attribute of renewable energy generation is separated from the commodity electricity produced and then sold to a third party – are widely considered a 'low quality' source in that they not only negate the need for new generation, but also introduce increased risk for project finance (Pinkel and Weinrub 2013; Holt, Sumner, and Bird 2011). Procurement from within California was limited to small hydro (7%), biogas (3%), and large hydro (10%), the latter of which is ineligible under the California RPS.

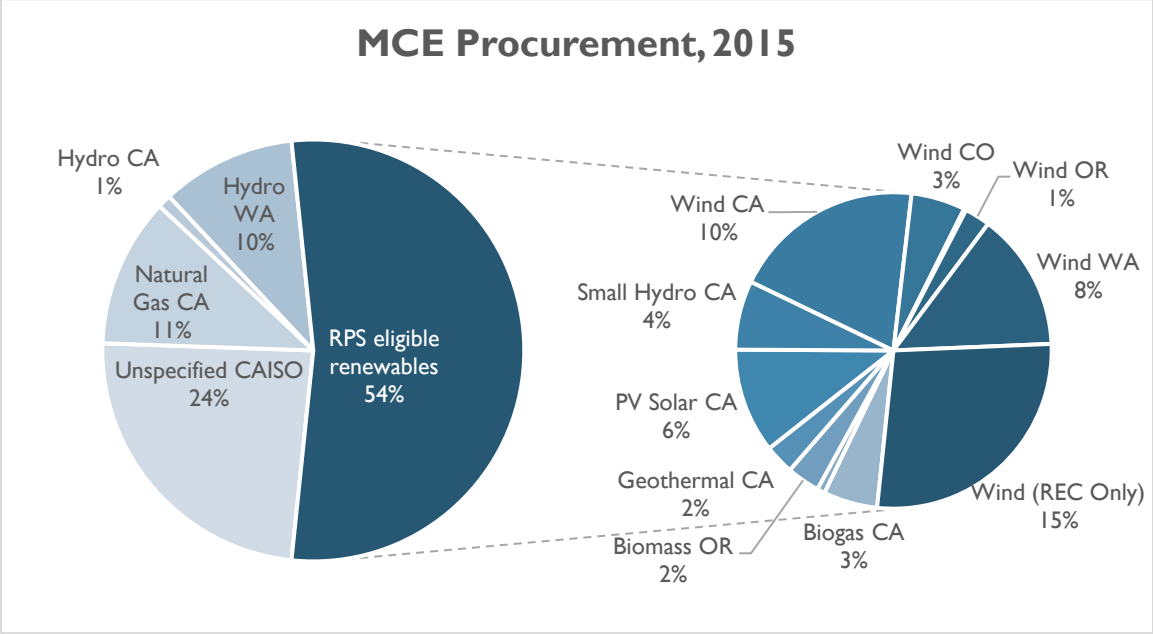


**Figure 3 Marin Clean Energy 2015 procurement by state and fuel type; Total procurement = 1,695.27 GWh**

Heavy criticism of MCE's reliance on unbundled RECs[2] has led to a recent and rapid shift away from this procurement strategy, with the share of unbundled RECs declining from 26% of total procurement in 2013 to around 15% in 2015. Growing acceptance of the viability of the CCA model among lenders and developers, due in large part to continued education efforts on the part of MCE staff and administrators, has allowed

[2] See, for example, Halstead 2015

MCE to increase the number of longer-term local generation contracts in its procurement portfolio. As a share of total MCE procurement, California solar PV increased from around 0.16% in 2013 to 6.6% in 2015.

A comparison of MCE procurement strategies with those of its associated utility Pacific Gas & Electric (PG&E) reveals some stark differences, as well as some notable similarities. The most striking difference is the share of the overall energy mix from renewable sources: 54% for MCE yet only 26% for PG&E. This difference is largely explained, however, by MCE's use of renewable energy certificates (15% of total procurement), and out-of-state wind.

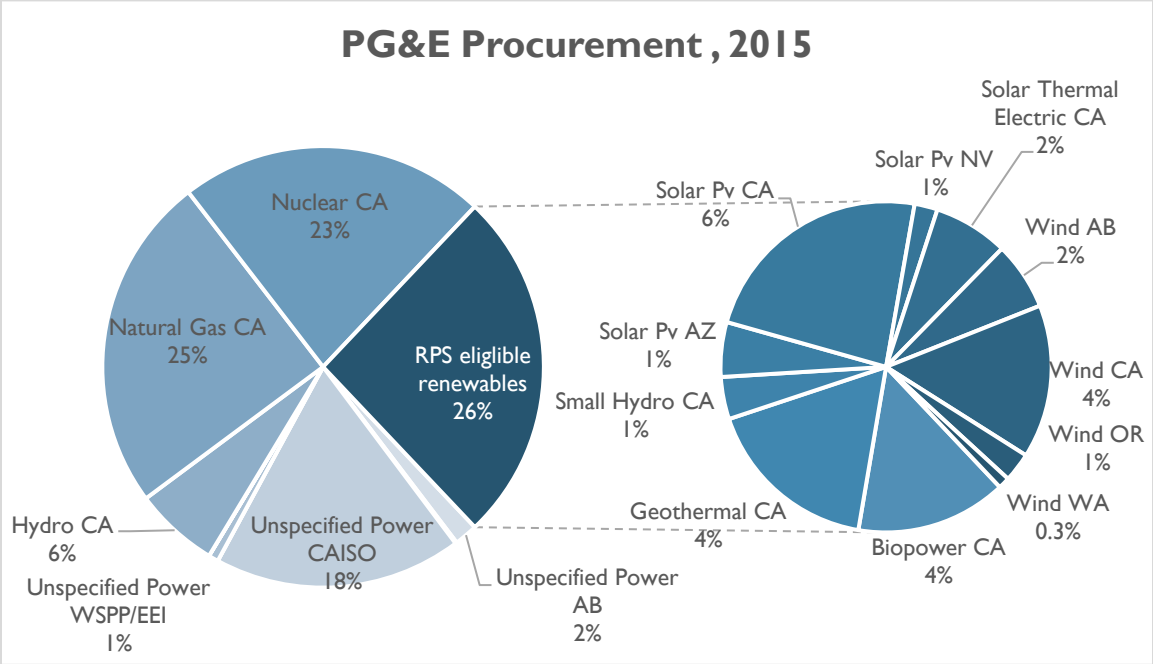


**Figure 4 Pacific Gas & Electric 2015 procurement by state and fuel type; Total procurement = 79,279.16 GWh**

In terms of in-state procurement, 25% of MCE's overall procurement in 2015 consisted of RPS eligible renewable energy sources from within California, compared to 21% for PG&E. Both MCE & PG&E rely heavily on small hydro and geothermal, yet the clear majority of these facilities were constructed prior to 1985, suggesting little benefit in terms of new generation capacity.

MCE's 2017 Integrated Resource Plan points to a continuing shift away from unbundled RECs toward a greater share of local generation. As of February 2017, MCE had entered 26 medium-to-long term contracts with developers of new and existing RPS eligible renewable energy projects in California (MCE 2017). In addition to the default "Light Green" option of 50% renewables and "Deep Green" 100% renewable plan, MCE now offers and a "Local Sol" option consisting entirely of locally produced solar. Deep Green power comes from renewable projects located in California, while Local Sol,

which is expected to become available this spring, will be sourced entirely from solar projects within MCE's service territory. In addition to procurement from utility-scale generators, MCE now has 9,600 net metering patrons—about 4% of its customers—who own 77 MW of solar capacity and who get paid full retail rate plus 1¢/kWh for surplus energy. MCE also offers a feed-in tariff for up to 15 MW of small-scale renewables, and is currently constructing a 10-MW solar project on a brownfield site owned by the Chevron oil refinery in Richmond, CA.

## 5.2 Sonoma Clean Power

Sonoma Clean Power's (SCP) governing body, the Sonoma Clean Power Authority, was formed in 2012 through a Joint Powers Agreement that currently includes the cities of Cloverdale, Cotati, Fort Bragg, Petaluma, Point Arena, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, Willits, Windsor, and the counties of Sonoma and Mendocino. SCP began service to commercial customers and approximately six thousand residential customers in 2014, and by early 2015, had commenced service to the 160,000 remaining Sonoma County residential and commercial customers.

**Sonoma Clean Power Authority: Objectives**

1. Reducing greenhouse gas emissions in Sonoma County and neighboring regions;
2. Providing electric power and other forms of energy to customers at a competitive cost;
3. Carrying out programs to reduce total energy consumption
4. Stimulating and sustaining the local economy, including by developing or promoting local distributed energy resources;
5. Promoting long-term electric rate stability, energy security, reliability and resilience

Source: Sonoma Clean Power Authority Joint Powers Agreement (as amended 2016)

**Table 2 Sonoma Clean Power Authority: Objectives**

SCP, also located in PG&E territory, was formed in response to community desire for local control of our electric energy supply, and demands from local residents and businesses for competitive rates, from cleaner sources, with more local control (Table 2). SCP's objectives broadly align with those set out by MCE, yet the two entities' approaches to procurement bear some key differences. Like MCE, however, SCP provides a greater share of renewables than its associated utility PG&E, 36% compared to 26%. Unlike MCE, however, SCP has made an explicit decision to avoid the use of renewable energy certificates as part of its procurement strategy. As SCP's overall procurement rapidly increased from less than 600 GWh in 2014 to almost 2,000 GWh in 2015, SCP's overall share of renewable energy procurement declined from 43% to 36%, with the shortfall made up of unspecified sources.

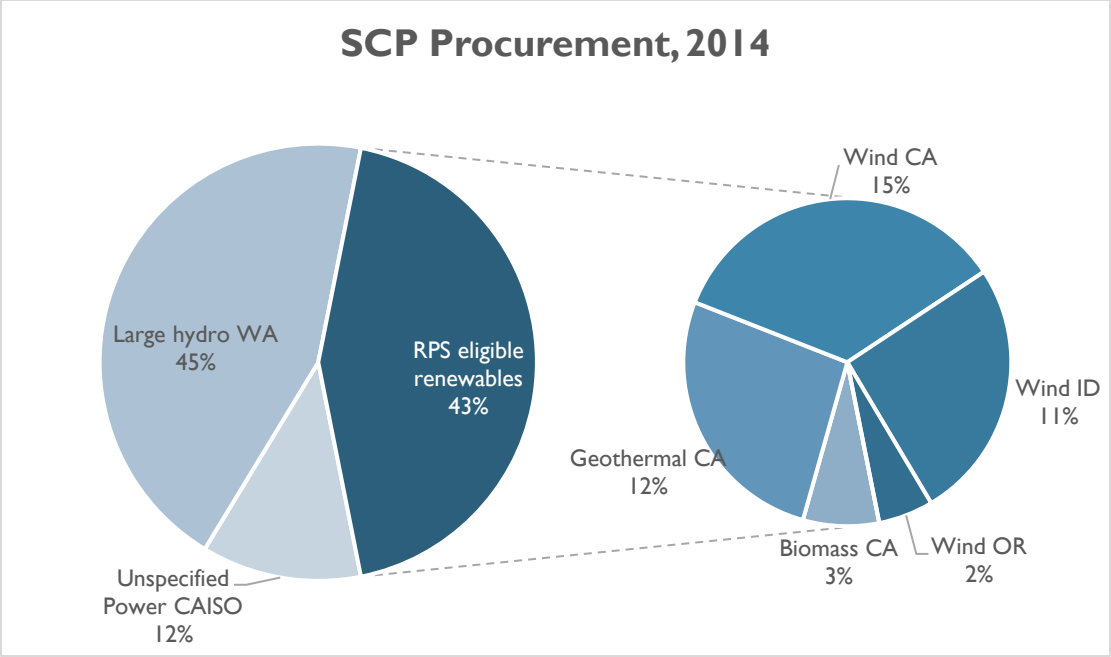


**Figure 5 Sonoma Clean Power 2014 procurement by state and fuel type; Total procurement 581.29 GWh**

SCP's focus on reducing GHG emissions translated into an initial procurement strategy comprised overwhelmingly of carbon free resources, both eligible (geothermal, wind, and biomass) and ineligible (i.e. large hydro) under the RPS. The decision to procure electricity from existing facilities reflects SCPs priorities, which state that until SCP achieves a stable state with sufficient financial reserves, a strong credit rating, and easy access to credit, the objective to develop local distributed energy sources should remain independent of the more general cost factors that impact rate competitiveness (SCP 2015).

While SCP has made a conscious effort to avoid the use of Category 3 renewable energy certificates, the considerable change in procurement between 2014 to 2015 reflects SCP's reliance on short-term contracts. Like unbundled RECs, the unpredictability of short-term contracts makes it difficult to determine future project cashflows, which may act as a deterrent for project financiers. With the exception of 6 contracts with established geothermal facilities, however, the vast majority of SCP's RPS renewable procurement (25.4% of total procurement) for 2015 was sourced from wind projects outside the state of California. In 2014, 70 MW procurement from the Recurrent Mustang solar project in Kings County, part of an overall 100 MW capacity project, the remaining 30 MW of which is contracted to MCE. The Mustang project, financed like many utility-scale projects through a combination of debt and tax-equity finance, suggests lenders are becoming increasingly comfortable with the CCA concept, which was a major issue for MCE early on. As of early 2017, SCP has been able to enter at least 6 20-year contract with in-state solar and wind projects.

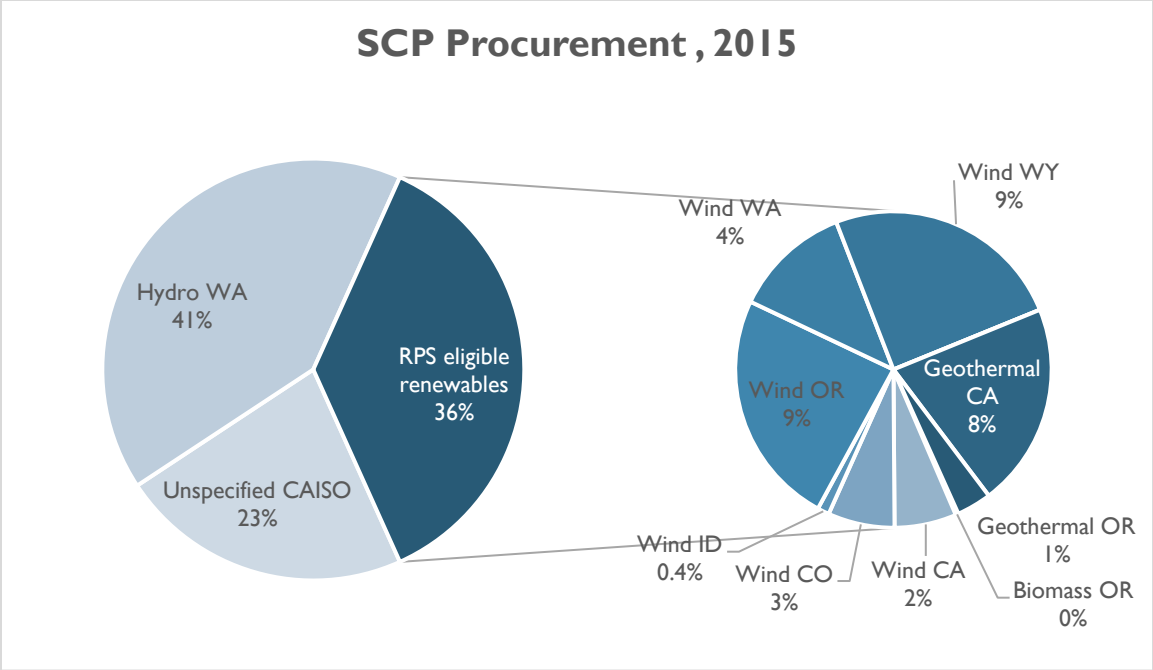


**Figure 6 Sonoma Clean Power 2015 procurement by state and fuel type; Total procurement = 1,987 GWh**

## 5.3 Lancaster Choice Energy

Lancaster, CA, a city of 160,000 residents located on the edge of the Mojave Desert north of Los Angeles, represents a stark geographic and socio-economic contrast to the areas serviced by MCE and SCP. In 2008, Mayor Rex Parris set the City a goal of becoming the first net-zero energy[3] city in the nation, and the 'alternative energy capital of the world' (City of Lancaster 2017). This effort has involved a range of policy initiatives involving the localization of energy governance, while also shifting Lancaster's role from one of energy consumer to major energy producer. The City's zero-net energy goals have informed numerous local initiatives designed to increase uptake of distributed and utility-scale solar generation and to increase autonomy over electricity purchasing decisions through the development and implementation of community choice aggregation.

Lancaster Choice Energy (LCE) was launched in 2015. Unlike MCE and SCP, which were both formed through Joint Power Agreements between multiple local governments, LCE was formed as a separate entity within the City of Lancaster, which affords the municipality full program autonomy and all revenue. While more closely linked to its associated local government, being established as a separate entity has meant LCE has faced many of the challenges relating to lack of agency credit rating as experienced by MCE and SCP. Lack of credit has been attributed to LCE's heavy reliance on third-party

[3] Although referred to as zero-net 'energy', this goal is currently restricted to electricity and does not include natural gas

providers in its early years of operation, reflected in the 63% share of unspecified power.

Similar to MCE and SCP, Lancaster Choice Energy (LCE) offers a default product comprised of 37% RPS eligible renewable sources, as well as a 100% renewable option. Despite similar providing a similar share of renewable sources, LCE's energy mix is by far the least diverse of the three CCA's discussed in this report. While attributable in part to LCE's relative youth, the lack of diversity and reliance on out-of-state RECs reflects the primary motivations behind the establishment of LCE. In contrast to MCE and SCP, LCE is driven by a focus on low-cost energy, more so than it is by GHG reductions or promotion of local generation. Somewhat paradoxically, Lancaster is now home to over 600MW of utility-scale either operational or approved and in various stages of construction, yet to date, LCE has only signed one 10MW PPA with a local developer.

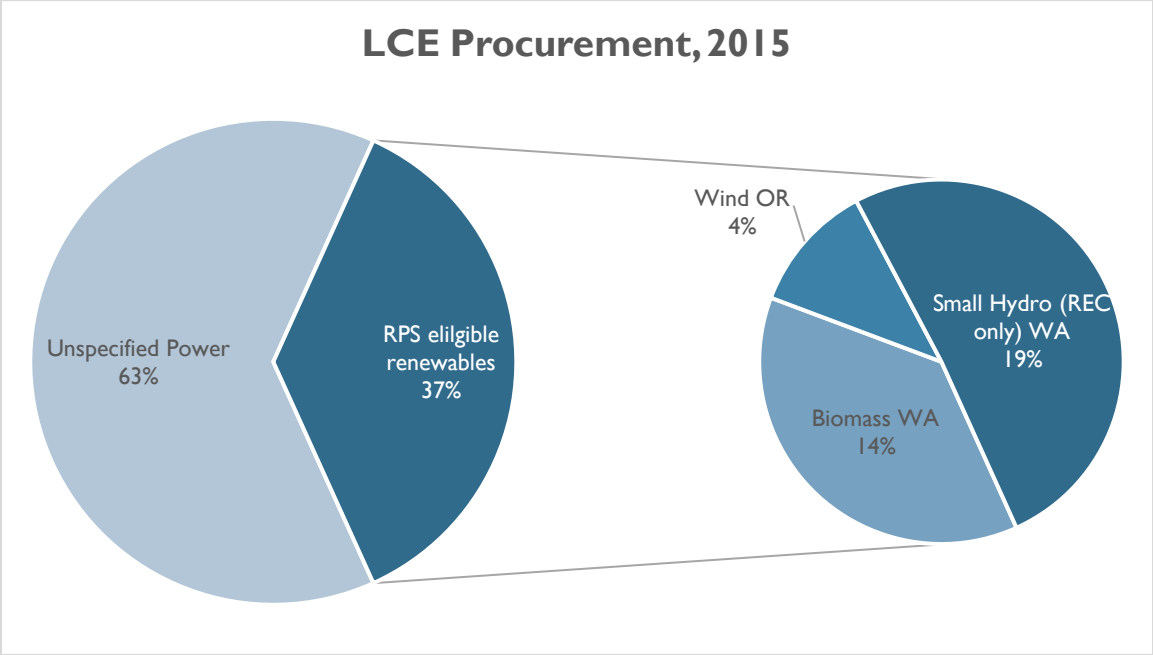


**Figure 7 Lancaster Choice Energy 2015 procurement by state and fuel type; Total procurement = 133.79 GWh**

While LCE has been able to compete with its associated utility SCE on cost while providing a greater share of renewable energy to its customers, the mix of renewable resources – consisting of out-of-state wind and small hydro renewable energy certificates – is considerably less diverse than that of SCE. While difficult to compare due to the large share of unspecified power procured by both LCE and SCE, this snapshot analysis suggests SCE, which procures over 10% of its electricity from relatively-recently constructed California solar and wind projects is making a much greater contribution to the development of in-state renewable energy resources than LCE, despite having a lower overall share of renewables.

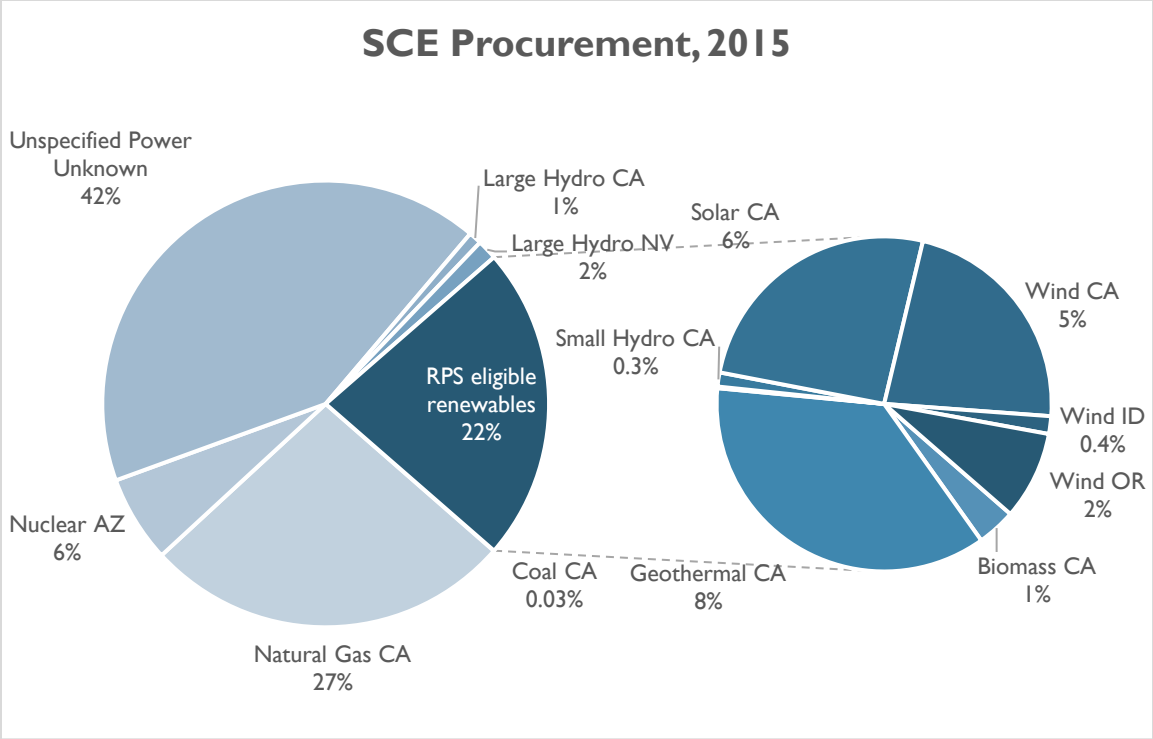


**Figure 8 Southern California Edison 2015 procurement by state and fuel type; Total procurement = 81,578 GWh**

# 6. Future Trends & Challenges

In April 2017, the Los Angeles County Board of Supervisors unanimously voted to establish a community choice aggregation program, Los Angeles Community Choice Energy (LACCE). The previous discussion regarding structural factors affecting CCA procurement strategies and the specific experiences of California's established CCAs points to a number of trends likely to shape both the effectiveness of LACCE as an alternative to the current utility-based governance model, as well at LACCE's ability to contribute to the Sustainable Los Angeles Grand Challenge goal of powering 100% of local energy and transportation needs with cleaner, renewable energy resources by 2050. The following section identifies five such trends.

## 6.1 Cost allocation

As noted in Section 4, the issue of charging "exit fees" to CCA customers to offset potential rate increases for utility customers has been a major point of contention since the legislation enabling CCA's in California was passed in 2002. CCA advocates claim that the current approach to cost allocation through the power charge indifference adjustment (PCIA) poses a major threat to CCA's long-term viability. Unstable, unpredictable, and rising PCIA charges, CCA advocates argue, will create a burden on Community Choice programs, making it difficult for them to provide the system reliability needed for their customers (CACE 2016). According to the California Alliance

for Community Energy, a community choice advocacy group, "the specter of a prolonged and unpredictable PCIA with no end in sight creates a high degree of uncertainty that undermines the Community Choice program's ability to engage in long term planning" (CACE 2016). At worst, rising PCIA charges could force CCA customers back to the associated utilities, leaving CCAs stranded with long-term contracts and an insufficient customer base to cover costs, and ultimately facing bankruptcy.

In 2016, in the wake of three years of rapidly rising PCIA charges, the Sonoma Clean Power Authority and Southern California Edison led a six-month effort involving IOUs, CCAs and other interested parties with a view to improving transparency, certainty and data access related to PCIA calculation. While the working group process produced some degree of consensus among parties in terms of improving the transparency, data access, and consistency of the current methodology, tensions remain regarding potential replacements for the existing framework.

One advantage of the PCIA is that it gives CCAs full autonomy over their future procurement decisions, a feature of core importance to the CCA model. Two of the proposals put forward in the working group process – lump-sum buy-out and the assignment of specific contracts to CCAs – involve a transfer of existing IOU contracts to CCAs, thus impeding the ability of CCAs to make future procurement decisions best suited to their particular objectives.

In a joint filing with the California Public Utilities Commission, California's three investor-owned utilities proposed their preferred alternative to the PCIA, known as a Portfolio Adjustment Mechanism (PAM). The utilities argue PAM would allow for a more accurate reflection of the current market value of their older contracted assets (SCE, PG&E, and SDG&E 2017). In the filing, the utilities claim that the current process overvalues the value of existing contracts, which results in an artificially low PCIA. Assuming the current mechanism does in fact overvalue these contracts, adoption of PAM would likely result in further increases in the exit fees paid by CCA customers, and ultimately threaten the long-term viability of the CCA model.

## 6.2 California renewables rush

California has long led the nation on renewable energy, particularly solar. For both utility-scale solar PV and solar thermal, in 2015 California had more capacity than the rest of the country combined, with 52% and 73% of the nation's total, respectively (EIA 2016a). While historical data presents Californian renewable energy resources in the Golden State as potentially limitless, these resources could potentially become strained in coming years.

One driver of potential supply constraints stems from the reduced availability of suitable land. At the state level, the Desert Renewable Energy Conservation Plan (DRECP), a major development in the context of California's renewable energy planning efforts, aims to protect and conserve desert ecosystems while streamlining renewable energy development in areas deemed suitable. The DRECP affects 22.5 million acres in the desert regions and adjacent lands across seven counties, restricts renewable energy projects to less than 4% of the 11 million acres of BLM land in California. Locally, predominantly rural areas have also objected to renewable energy projects, particularly utility-scale wind, on the grounds that such projects produce 'visual blight' and, in the case of unincorporated areas of norther Los Angeles County, contradict the county's rural dark skies ordinance. Combined, these federal and local restrictions on land use could significantly constrain future large-scale development of renewable energy resources.

On the demand side, state and local level efforts continue push for continued expansion renewable energy resource development. The proposed SB 584 would require 100% of the state's electricity to come from clean sources such as solar and wind by 2045, and also bring the state's goal of reaching 50% renewable energy forward from 2030 to 2025. While not obligated to do so, a growing number of CCAs, including LACCE, are proposing to offer their customers the option of 100% renewable energy. In many cases, however, CCAs have been proposed by localities that possess insufficient local resources to meet the renewable energy supply targets promised to their customers. In these instances, the CCA approach creates a need to import renewable energy, placing greater strain on those few areas within the state – such as the LA region – that are fortunate to be endowed with such resources. With 8 CCAs set to launch in 2017 and a further 20 in the scoping phase in California alone – many of which are promising an option of 100% renewable electricity to their customers – the race to secure California's remaining utility-scale solar potential is on.

### 6.3 Disruptive potential of short-term contracts and renewable energy certificates

Policy context, models of governance and access to capital not only shape the amount of renewable energy a CCA can procure, but also affect the type, size, location, and contract length of that procurement. While many of the emerging CCA's, including LACCE, have stated that Category 3 renewable energy certificates (RECs) will not form part of their procurement, RECs have proven to be a crucial element in allowing newly-formed CCAs to overcome a lack of credit rating while meeting renewable energy procurement objectives.

As noted in the context of MCE, however, the use of RECs not only reduces the need to procure through new local generation projects, but may also shape lender's

willingness to finance generation projects elsewhere. While compliance market RECs tend to be relatively stable, voluntary market RECs tend to be more volatile, thus decreasing the certainty around future cashflow projections, which is of primary concern to potential debt financiers (Holt, Sumner, and Bird 2011). As a result, it would likely be more difficult to obtain finance for a project based on projected cashflows from voluntary REC markets that it would from a stable 20-year power purchase agreement with creditworthy off-taker. Big developers, on the other hand, may be able to draw on their own funds (i.e. internal equity finance) or from a parent company, which thus affords greater flexibility and may allow for higher risk projected REC cashflows (Holt, Sumner, and Bird 2011).

## 6.4 Beyond electricity

Historically low solar generation costs – reportedly now under 4c / kWh in some cases (Andorka 2017) – make utility-scale solar an attractive option for CCAs looking to rapidly increase the share of renewable energy provided to customers while maintaining competitive rates. However, such low rates are deceptive as they fail to account for the cost of the corresponding storage that would be required to deliver the same continuous 24-hour energy service. The rapid decline in solar costs combined with sluggish development of the state's storage capacity have in recent years resulted in excess generation, the level of which have emerged as a major concern for the state's grid operator (CAISO 2017). While over-generation may in some ways be viewed as a success, excess attention on the development of renewable energy resources obscures the breadth and magnitude of the task of reducing California's greenhouse gas emissions.

Electricity accounts for only 20% of California's greenhouse gas emissions, with the remainder comprised of transportation (40%) and natural gas (30%). Meeting the Sustainable LA Grand Challenge goal requires CCAs to move beyond the focus on share of renewable electricity procurement as a primary concern, and begin to explore policy options with potential to reduce emissions in other sectors. While CCAs are beginning to make progress in the areas of energy efficiency, demand response, EV charging, battery storage, and transportation[4], the performance of CCAs in these areas currently lags that of utilities.

Energy storage is viewed as essential element in dealing with issues of period over- and under-generation inherent to many renewable energy technologies (Dunn, Kamath, and Tarascon 2011). In 2013, the CPUC mandated storage procurement targets for all load-serving entities in California. The target mandates investor-owned utilities procure a combined total of 1,325MW of storage capacity by 2020, while also requiring non-utilities, including CCAs, to procure approximately 1% of their peak load by 2020. In its decision, the CPUC acknowledged that while the CCA target is lower than that for

[4] The role of LCE in the local transit agency's conversion to a completely electric bus fleet, is one example.

utilities, this is justified as CCA customers will have to pay "non-bypassable charges that may be used by the IOUs to develop energy storage systems" (CPUC 2013, 46). In addition to the overall target being less than a tenth of that required to support the statewide 50% renewable energy target mandate under the RPS (Denholm and Margolis 2016), questions remain as to how the evolving financial relationship between utilities and CCAs will impact the ability of all load serving entities to drive the necessary innovation and deployment to meet immediate and future energy storage goals.

## 6.5 Moving away from IOUs as a vehicle for policy implementation

As regulated monopolies, California's investor-owned utilities have long served as an important vehicle for the execution of state policy. The passing of AB 995 in 2000, for example, drove expansion of CA renewables by requiring IOUs to invest in renewable generation. With IOUs playing less of a role, and CCAs remaining outside the regulatory mainstream, legislators and regulators may lose this important policy delivery mechanism.

MCE and SCP have both undertaken pilot programs providing financial incentives for electric vehicle drivers, yet to date, only LCE has implemented supporting infrastructure such as charging stations at multi-unit dwellings, workplaces, or public interest destinations, although not to the scale as a have PG&E, SCE, and SDG&E. All three CCAs assessed in this report discuss the importance of energy storage in their resource plans, and while MCE and LCE have both moved forward with some level of storage procurement (2.4MW and 0.3MW, respectively) it remains to be seen whether these efforts can be brought to the requisite scale to manage the increased penetration of intermittent renewable energy resources such as solar and wind. As noted in SCP's resource plan, "storage is currently expensive compared with other resources that have similar operating characteristics, and as a technology category is still in the early stages of large-scale commercialization" (SCP 2015, 15).

While acknowledging that California's CCAs are still in initial stages of development, these examples raise significant questions over whether an increasingly fragmented electricity retail sector can drive innovation and program delivery at the scale required to meet California's aggressive environmental and energy goals. One area in which CCAs may be better positioned to drive policy implementation is in the development of distributed energy resources (DERs). Unlike utilities, for which maximizing returns to stakeholders is a primary concern, CCAs operate under a much wider range of objectives. While the issues discussed previously relating to CCAs' ability to access finance still hold, it is possible that CCA objectives to promote renewable energy generation and local economic development may make CCAs more willing – and thus better suited – to undertake development and implementation of DERs.

# 7. Conclusion

At their current rate of expansion, CCA's represent a potentially drastic reconfiguration of the utility-based model of energy governance that has dominated for over a century. While not yet providing 100% renewable energy to *all* customers, the CCA model provides a useful lens through which to examine tested means of delivering renewable energy, while also flagging key challenges that may need to be addressed if Los Angeles is to meet the ambitious UCLA Grand Challenge goal.

Despite broadly consistent objectives, this study finds considerable variation in the renewable energy procurement strategies of California's three most-established CCAs. CCAs' ability to pursue procurement objectives is found to be constrained in early years of operation by lack of credit rating, as well as the challenges in balancing renewable energy targets with other potentially competing objectives such as lowering electricity rates for consumers while promoting local economic development. While immediate issues around access to capital appear to be resolved as CCAs mature, ongoing policy uncertainty regarding cost allocation between utility and CCA customers raises some serious concerns about the model's viability in the longer term. The specific impact CCAs will have on the future development of California's renewable energy resource potential – including the type, size and location of generation – will largely depend on future CPUC rulings regarding cost allocation between utilities and CCAs and the specific requirements contained in California's ever-increasing renewable portfolio standard.

While distributed generation options such as rooftop solar have proliferated in recent years, powering 100% of LA's energy and transportation needs will involve a dramatic shift in the ways in which energy is currently procured. For over a century, decisions over energy procurement – source, location, and price – have rested in the hands of utilities, operating as regulated monopolies and giving individual consumers, cities and counties, limited choice over procurement. If CCAs are to meet 100% renewable energy targets, however, the focus must shift from a myopic pursuit of renewable electricity toward a more holistic model that works to meet future energy storage requirements while also electrifying transportation and natural gas applications, which combined account for 70% of California's emissions. While MCE, SCP and LCE have engaged in some electric vehicle pilot projects and rebate programs, a question mark looms over whether CCAs can promote such as shift at the scale required to meet regional, state, and possibly federal, objectives.

As CCA's continue to develop in California they will likely face a number of challenges to their economic viability, which could have serious implications for ambitious renewable energy targets such as the Sustainable LA 100% renewable energy goal. Policy uncertainty about future cost allocations between utility and CCA customers and

increased competition in increasingly crowded retail electricity sector are just two factors that could determine the ultimate success of the CCA model. Given the growing variation in constituencies CCAs represent – from affluent coastal communities to less wealthy inland areas – policymakers should attend to the ways in which theses dynamics may either alleviate or exacerbate existing inequalities.

In closing, it should be stressed that it is still early days for the CCA model in California, and there are thus significant dangers in making comparisons between relatively recent innovations in energy governance and utilities that evolved over a century or more. With these limitations in mind, the study is intended as a preliminary assessment, providing a baseline analysis which can be built upon in future years as the presence of mature CCAs expands across the state. As CCA's and the associated policy landscape continue to evolve, the findings of this report are intended as an empirical and theoretical basis from which policymakers across the LA region, the state and the nation can draw to ensure future renewable energy targets are met in a way that maximizes their social, economic and environmental potential.

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# APPENDIX A: MAJOR INDEPENDENTLY-OWNED AND PUBLICLY-OWNED UTILITY POWER CONTENT LABELS, 2015 (CEC, 2017)

| | **California** | **LADWP** | | **SCE** | **PG&E** | **SDG&E** |
|---|---|---|---|---|---|---|
| **Power Mix** | Statewide Power Mix | Default | Green Power | Default | Default | Default |
| **Eligible Renewable** | **22%** | 21% | 100% | 25% | 30% | 35% |
| Biomass & waste | 3% | 4% | 100% | 1% | 4% | 2% |
| Geothermal | 4% | 2% | | 9% | 5% | 0% |
| Small hydroelectric | 1% | 1% | | 0% | 1% | 0% |
| Solar | 6% | 3% | | 7% | 11% | 18% |
| Wind | 8% | 11% | | 8% | 8% | 15% |
| **Coal** | **6%** | 37% | | 0% | 0% | 0% |
| **Large hydroelectric** | **5%** | 3% | | 2% | 6% | 0% |
| **Natural gas** | **44%** | 25% | | 26% | 25% | 54% |
| **Nuclear** | **9%** | 10% | | 6% | 23% | 0% |
| **Other** | **0%** | 0% | | 0% | 0% | 0% |
| **Unspecified sources of power*** | **14%** | 4% | | 41% | 17% | 11% |
| **TOTAL*** | **100%** | 100% | 100% | 100% | 100% | 100% |

*Column may not sum to 100 due to rounding

**"Unspecified sources of power" means electricity that is not traceable to specific generation sources by any auditable contract trail or equivalent, including a tradable commodity system, that provides commercial verification that the electricity source claimed has been sold once and only once.

# APPENDIX B: COMMUNITY CHOICE AGGREGATOR POWER CONTENT LABELS, 2015 (CEC, 2017)

| | California | Marin Clean Energy | | Sonoma Clean Power | | Lancaster Choice Energy | |
|---|---|---|---|---|---|---|---|
| **Power Mix** | Statewide Power Mix | Light Green | Deep Green | Clean Start | Ever-Green | Clear Choice | Smart Choice |
| **Eligible Renewable** | **22%** | **52%** | **100%** | **37%** | **100%** | **35%** | **100%** |
| Biomass & waste | 3% | 5% | | | | 14% | |
| Geothermal | 4% | 2% | | 9% | 100% | 0% | |
| Small hydroelectric | 1% | 4% | | | | 19% | |
| Solar | 6% | 5% | 25% | | | 0% | |
| Wind | 8% | 36% | 75% | 28% | | 2% | 100% |
| **Coal** | **6%** | | | | | | |
| **Large hydroelectric** | **5%** | **12%** | | **41%** | | | |
| **Natural gas** | **44%** | **12%** | | | | | |
| **Nuclear** | **9%** | | | | | | |
| **Other** | **0%** | | | | | | |
| **Unspecified sources of power**** | **14%** | **25%** | | **23%** | | **65%** | |
| **TOTAL*** | **100%** | 100% | 100% | 100% | 100% | 100% | 100% |

*Column may not sum to 100 due to rounding

**"Unspecified sources of power" means electricity that is not traceable to specific generation sources by any auditable contract trail or equivalent, including a tradable commodity system, that provides commercial verification that the electricity source claimed has been sold once and only once.