October 2018

BUSINESS PLAN
FOR THE FORMATION OF A COMMUNITY CHOICE AGGREGATION PROGRAM
FOR THE CITY OF SAN DIEGO

Prepared By

MRW & Associates

Prepared for

The City of SAN DIEGO

This Community Choice Aggregation Business Plan was prepared by MRW & Associates LLC (MRW) under the direction of the City of San Diego's Sustainability Department. MRW was founded in 1986 by current California Energy Commission Chair Robert Weisenmiller to serve California's burgeoning independent power community. MRW's current consulting services continue focus on California and western United States electricity and natural gas markets. Its services include retail rate forecasting, regulatory analysis and advocacy, energy project cost analysis, and energy project finance due diligence.

With respect to Community Choice Aggregation, MRW has performed over a dozen CCA feasibility studies, plans and peer reviews, and provides ongoing rate analysis and regulatory assistance to many CCAs throughout the State.

Beyond CCAs, MRW provides services to municipalities (including the City of San Diego for over 25 years), universities, large commercial and industrial end-use customers, energy service providers, renewable energy trade groups, and banks and financial institutes.

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Executive Summary

The City of San Diego is considering forming a Community Choice Aggregation (CCA) service. This Business Plan is not a commitment to move forward with formation, but rather provides a framework if the City chooses to move forward. This builds upon past work by the City to evaluate options to reach its 100% renewable energy goal by 2035 including a CCA feasibility study in 2017.

CCA Goals

A City of San Diego CCA (CSDCCA) would have two fundamental goals. The first goal is to offer rates that are competitive with those offered by the incumbent electric utility, San Diego Gas and Electric (SDG&E), while operating in a matter consistent with an investment-grade entity. The CCA would not move forward unless there is confidence that both rate competitiveness and financial stability can be achieved. Second, the CCA would contribute to meeting the City's Climate Action Plan goals (CAP). More specifically, the CCA allows for a clear path to achieving the goal of 100% renewable electricity by 2035.[1] Additionally, the CCA has the potential to meaningfully contribute to meeting other CAP goals by providing programs and strategies to increase of local renewable generation, the energy efficiency of City-owned and other publicly- and privately-owned buildings and promoting electrification of the transportation sector.

While maintaining rate competitiveness, financial stability, and contributing to the City's CAP are primary goals, a CSDCCA can serve as a vehicle pursue other goals that benefit the City, its residents and businesses. These include:

- **Economic development**, by offering reduced electricity rates, allowing additional dollars to flow into the local economy; and offering programs that allow households and businesses to reduce power consumption, such as energy efficiency and distributed energy resources.
- **Local jobs and employment.** Beyond the jobs that result from the economic stimulus of reduced power costs, the CCA can more directly incent and support local job creation though employing local workers in CCA administration, using local contractors for energy efficiency programs and distributed energy generation (e.g., rooftop solar installers/maintainers).

[1] California as a whole is moving toward a similar carbon-free electricity policy. Senate Bill 100, which was signed into law by Governor Brown on September 17, 2018, increases the renewable power content requirement of all utilities (and other retail power providers, including CCAs) from 50% to 60% by 2030 and sets a policy that renewable and zero-carbon resources supply 100% of the electricity 2045. The net result is that the CAP would achieve carbon free power approximately ten years before the state's target date (2035 versus 2045).

- **Prioritization of renewable power development.** A CCA may put priority on distributed and locally-sited utility-scale renewable projects. As the CCA's portfolio is developed, subject to cost constraints, projects in the City would be given highest priority, followed by projects in the County, followed by projects in adjacent counties, and followed by projects located elsewhere.
- **Local citizen input and participation.** A key benefit of a CCA is to allow better reflections of community interests and values than can be achieved through an investor-owned utility. The CSDCCA will be committed to providing opportunities for citizens to provide input into its programs and policies.

Management Structures

The City must decide between two primary governance options for the CCA: the City as the sole government agency responsible for the CCA's creation and operation; or, participation with other agencies in a joint-powers authority (JPA), wherein multiple agencies share these responsibilities. In a sole jurisdiction approach, the City maintains full flexibility—and responsibility—for developing policies and procedures. This means that policies and procedures can be tailored to and responsive to the City's stakeholders and constituents. With respect to the second option, a JPA is an independent agency that operates on behalf of the public agencies which are party to its creation. In this approach, the City effectively shares responsibility with the other agencies participating in the JPA and receives some benefit in financial separation of the City's general fund from the JPA's finances. The divisions of these responsibilities and the sharing of decision-making authority would be determined at the time the JPA is created.

The quantitative and pro forma analyses in this business plan assume the first option (a city-only CCA) only out of practicality and should not be seen as a recommendation. The City could quite reasonably team with other jurisdictions within SDG&E's service area to form a JPA. That path would require a longer start-up phase, as multiple political bodies would have to sign off on the JPA formation documents and basic policies. Furthermore, the total costs shown here are proportional to the CCA size; thus, joining with smaller cities would not appreciably change the average cost relative to a city-only CCA.

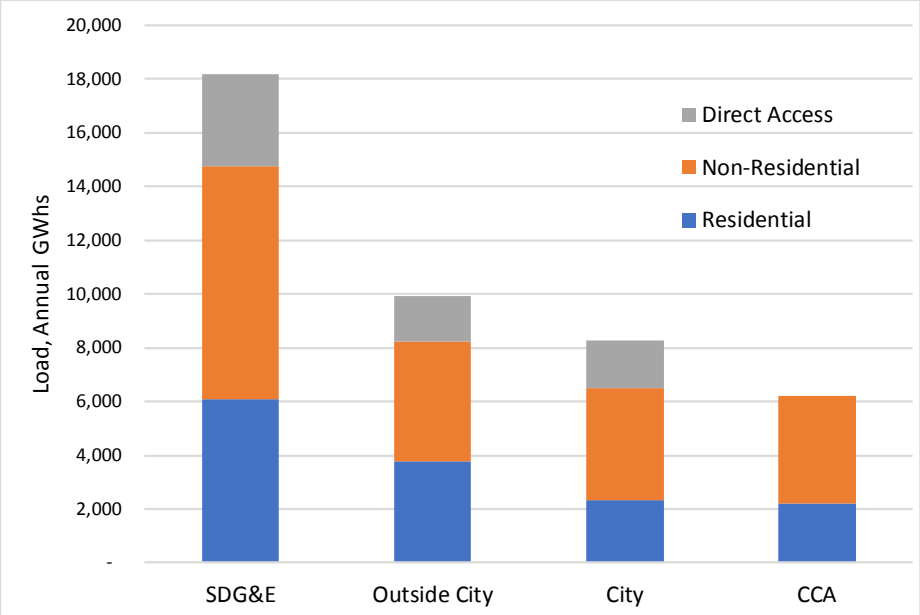
Load to be Served

Figure ES-1 shows a simple breakdown of the annual electric load in GWhs (millions of kilowatt-hours) for SDG&E. The first column shows the total current load of SDG&E broken down into three categories: residential (homes and apartments), non-residential (commercial, industrial, street lighting, agriculture) served by SDG&E, and Direct Access (DA). DA consists of commercial and industrial customers that receive their power from third-party, non-SDG&E sources. Currently, about 33% of SDG&E's load is residential, 47% is non-residential served by SDG&E, and 20% is non-residential served by DA.

The City's total annual electric load is about 8,200 GWhs, or 45% of SDG&E's total load. The City's breakdown between residential, SDG&E-served non-residential and direct access is about

the same as the utility as a whole. Because the amount of DA service allowed in SDG&E's service area is capped by law, this amount is not likely to markedly increase in the near term.[2] Furthermore, due to existing contracts with their ESPs, DA customers are not likely to join a CCA. Thus, the pool of possible CCA customers is limited to those currently served by SDG&E. Assuming that 5% of the customers who may join the CCA choose to opt out and remain on SDG&E service, the total load to be served by the San Diego CCA is a bit over 6,000 GWhs.

Figure ES-1: SDG&E Load Breakdown



POWER SUPPLY

Out of necessity, a CSDCCA would rely upon existing resources for its power supply in the first years of service. (As a new entity, a CCA cannot have new projects built prior to formation or the receipt of income; thus, all CCAs have begun service contracting with a power provider to serve the CCA's immediate energy needs, followed by a ramp-up of procurement with new renewable power projects.) After establishment, the CCA would transition into directly contracting with specific power projects, whether they be new renewables or short-term contracts with already existing renewable or conventional resources. Whatever the specific process, the

[2] Senate Bill 237 (Hertzberg), signed into law on September 20, 2018, expanded the "cap" on direct access (DA) load by 16% (4,000 GWhs state-wide) and requires the California Public Utilities Commission to provide the legislature recommendations concerning further expansion of direct access. The impact of SB 237 is included in the business plan by assuming an incremental DA load would not be served by the CCA.

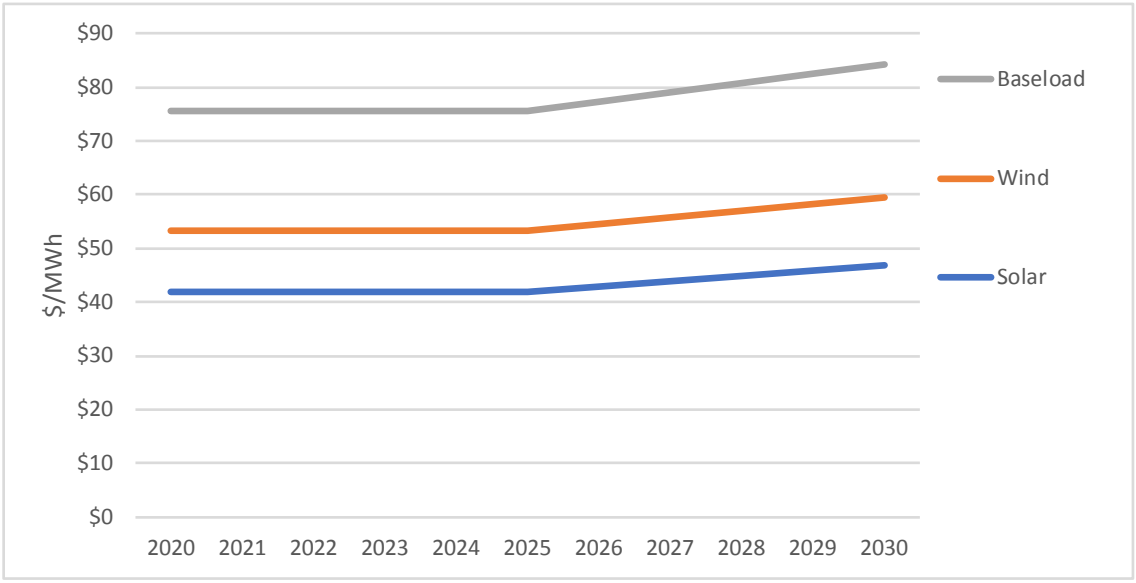
CSDCCA power supply plan will be guided by legislative requirements, regulatory mandates and CSDCCA policies, as well as future market dynamics.

In the longer term, once financially stable, the CSDCCA would develop its own new renewable resources, either through direct ownership or through power purchase agreements. Some of the existing CCAs are already building out their own new renewable power portfolio. For example, Peninsula Clean Energy has aggressively issued requests for proposals and signed power purchase agreements with developers for new solar generation in central California while East Bay Clean Energy has a local business development plan in place to optimize its pursuit of local solar projects.

The analysis in this Business Plan assumes that the CCA begins service in 2020 (although given the logistics required to form a CCA, a 2021 launch is more realistic) with at least 50% of its electricity needs met using qualifying renewable resources. This fraction increases linearly such that the CAP goal of 100% renewable is met in 2035.

Assumed renewable prices are shown in Figure ES-2. The renewable costs are assumed to remain approximately flat though 2025, and then escalate at 2% per year thereafter. The starting values are consistent with current reported renewable contract prices from other California CCAs and municipal utilities, with trends consistent with those reported by the US Department of Energy's Energy information Administration forecasts.

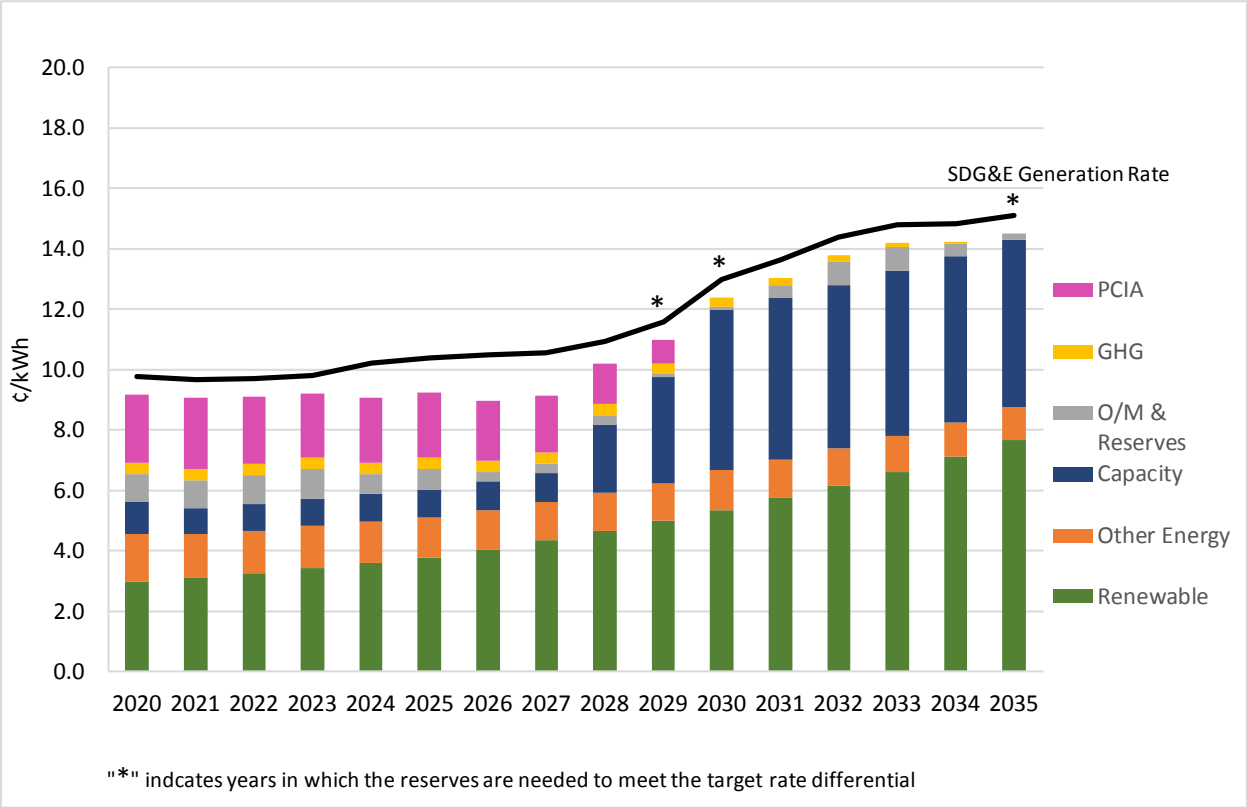
Figure ES-2: Projected Average Renewable Power Costs



Rate Comparisons

Figure ES-3 shows the Base Case forecast of average CCA costs and SDG&E's generation rates. The bars in the chart show the forecasts of the major cost components of CCA operation, while the single line shows the forecast of SDG&E's generation rate. When the bars are below the line, the CCA's average operating costs will be below the SDG&E generation rate; meaning that it can offer power to customers at a rate lower than or competitive with SDG&E.

Figure ES-3: Average CCA Cost Projection (Base Case)



The bottom-most green segment represents the cost of renewable power to the CCA. The renewable power costs ramp up with increasing renewable content, such that by 2035, when 100% of the power is met renewably, roughly two-thirds of the costs are for the renewable power.

The brown segment is for the costs of non-renewable, wholesale market power. This segment slowly decreases, as renewable power increases. It does not completely go away, even in 2035 when the CCA's resources are "100%" renewable, because there will still be a need for generating power when renewables are not available. (The portfolio is still net 100% renewables, as renewable power generated in excess of the CCA's needs, such as sunny afternoons, offset the

non-renewable market purchases.) Note that by 2035, battery storage technology may well be advanced enough so accomplish this instead, however explicit forecasts have not been made concerning the adoption and technological maturation (i.e., costs).

The blue segment is for capacity. That is, the CCA must demonstrate that it has the generating capacity (in megawatts) to ensure that it can serve all of its load, even if the "intermittent" renewable resources are not generating at their optimal rate (e.g., solar on cloudy days). The more intermittent renewables—solar and wind—that are added to the CCA's generating mix, the more back-up capacity is needed to ensure reliability. In the near term there is a glut of capacity in California. Thus, from 2020 through 2027 capacity costs to are low. By 2030, the capacity glut will be filled (due to increased intermittent renewables and the retirement of aging fossil plants). This will increase the capacity costs to something closer to the cost of a new combustion turbine.

The gray segment is for operations and debt service. That is, from 2021 through 2024, the loans associated with the start-up costs are paid down.

The orange segment is for carbon cap and trade allowances. Because the CSDCCA's procurement is set to meet the City's Climate Action Plan of 100% renewable by 2035, the orange segment becomes nil by the end of the study period. Note that for practical purposes, the carbon cap-and-trade allowances would be built into the purchase prices of natural gas filed market resources. However, because it is an important variable on its own, the figures have separated it out.

The top-most pink segment is for the Power Charge Indifference Adjustment (PCIA), a fee paid to SDG&E to ensure that the operation of the CCA does not strand SDG&E's remaining bundled customers with costs associated with power purchased on behalf of customers who have shifted to the CCA. The Business Plan uses the formula and approach reflected in the Alternative Proposed Decision of Assigned Commissioner Carla Peterman in California Public Utilities Commission (CPUC) Rulemaking 17-06-026, which was approved by the Commission on October 11, 2018. In addition, the market price and SDG&E portfolio assumptions used in the PCIA calculations are consistent with those used to forecast SDG&E's generation rates.

The black line represents SDG&E's average generation rate. To forecast SDG&E's generation rates, the comparison model used information regarding SDG&E's utility-owned generation, power contracts, power market costs, and by closely tracking changes in SDG&E revenues and costs through its filings in several CPUC proceedings. In particular, it takes the most recent 2018 SDG&E filing of generation rates and applies the known and anticipated changes to the wholesale power market prices and SDG&E's power purchase contracts.

The results shown in the base pro forma are for expected market conditions and outcomes. However, it is unlikely that the conditions assumed in the base case will occur exactly as assumed. In order to evaluate the robustness of the base case, the key variables must be identified, and pro forma analyses conducted with other assumptions for those key variables to "stress test" the assumptions. The three variables with the greatest potential impact on the overall average cost of the CCA were investigated: (1) higher or lower renewable supply costs, (2)

higher or lower natural gas prices, (3) what would happen if the PCIA was 25% higher than forecast,[3] and (4) high opt-outs due to expanded Direct Access.

The specific sensitivity scenarios are summarized in Table ES-1. In most cases, the CCA can still be competitive with SDG&E, although at varying levels of rate discounts. The exception to this is the High Renewable Scenario, wherein the CCA costs might be nominally higher than the SDG&E Rate. Note that higher renewable prices affect both the CCA and SDG&E, but they have a greater effect on the CCA because SDG&E has significant amounts of renewable resources under long-term contract. Last, while all the variables explored in the sensitives could occur, they are not equally likely, nor are any likely to persist throughout the 15-year study period.

Table ES-1: Sensitivity Case Results Summary

SCENARIO	Consistent Savings Achievable	Likelihood
Base Case	0.7¢/kwh	Possible +
High Gas Price	1.0¢/kWh	Possible +
Low Gas Price	0.3¢/kwh	Not likely
High Renewable Price	-0.2¢/kWh	Not likely
Low Renewable Price	1.0¢/kWh	Possible -
High PCIA	0.0¢/kWh	Possible -
High Opt-Out	0.6¢/kWh	Possible

These comparisons are forecasts based on the best public data available. In the near term, there is significant uncertainty caused by not knowing how SDG&E will change its procurement practices in response to departure of the City's load to CCA. There is further compounded uncertainty after 2027, as the cost of capacity, a factor not important in the near term, becomes a driver of rate increases. Lastly, unknowable technology change, such as the pace and cost of the development of battery storage, can impact the forecasts of latter years. Nonetheless, because common assumptions are used across both SDG&E and the CCA, the relationship between the rates should approximately hold.

[3] Although the PCIA is explicitly modeled to be consistent with the underlying SDG&E power costs and wholesale power markets, there will be year-to-year volatility that can cause it to increase (or decrease) randomly. Furthermore, additional changes to the PCIA calculation could occur. The arbitrary 25% increase in PCIA in this sensitivity reflects these possibilities.

OPERATIONS

Supply Management

As shown on page 5 in Figure ES-3, the majority of the CCA's costs are for the power supply. Therefore, sound supply management is critical to a CCA's viability. The first fundamental decision that the CCA management or board would need to make would be how much, if any, of the supply management would be conducted by CCA staff, with the remainder outsourced to other entities. Some functions, such as schedule coordination (i.e., hour -to-hour management of the CCA's power in the California Independent System Operator (CAISO) market) would need to be handled by a qualified contractor. Other functions, such as the determination of desired resources, long-term resource planning, issuance of request for offers for power, can be handled either in-house or outsourced to qualified contractors.

To the extent feasible, the CCA will meet its GHG goals through new, preferably local renewable generating capacity and demand-side efforts, including energy efficiency and conservation programs. The CCA would evaluate opportunities for constructing or investing in new resources such as in-City solar photovoltaic cells, local renewable distributed generation such as fuel cells, and one or more regional wind turbine farms, as well as demand-side management, including conservation, peak shaving, and increased energy efficiency efforts.

Rate Setting

CCAs have, by statute, flexibility in how they set rates. CCAs typically set rates as a prescribed amount below their incumbent IOU's rates, be that a percent discount or a fixed cent per kilowatt-hour discount. The discounts are set so that the CCA collects enough revenue to cover its costs. The "discount-off-of" rate-setting provides for easy comparisons between incumbent utility and CCA rates but is by no means the only option. However, they are set, CSDCCA's rates will "provide sufficient resources for the continued financial health" of the enterprise and be based on cost of service. How exactly the rates would be set would be determined by its management or board.

CSDCCA's rate setting process would be open and transparent to the public. The proposed rates would be presented to management or the board and the public in December of the year prior their implementation. Management or the board would review the proposed rates and take public comment. The new rates would be implemented one month following the implementation of SDG&E's Annual Electric Rate Advice Letter, which typically takes effect January 1 or each year.

Back-Office

The City will need to determine which aspects of the CCA will be operated and managed by City staff and which aspects are candidates for outsourcing to other entities. The City could break up the various services required to operate the CCA and select vendors for certain specialized functions where specific expertise or experience is necessary. Some of the key back-office activities include:

Data management. Data management entails daily electronic communication with SDG&E: SDG&E sending the CCA data on customer use, bills paid, unusual account activity, etc.; calculating the CCA portion of each customers' bill based on the usage data provided by SDG&E; and communicating that bill amount to SDG&E for it to put on the customer's bill and collect.

Communications/Call Center. Consistent with all currently operating CCAs in California, initially the CSDCCA would likely initially outsource its call center. CPUC required and general communications may be coordinated through the City's Sustainability Department and Communications Department, which would coordinate CCA communications and outsource appropriate activities (e.g., brochure production, banners, advertising, etc.)

Legal Services. Assuming it organizes as a City Enterprise, CSDCCA will utilize the San Diego Office of the City Attorney as legal counsel to advise regarding administration of CSDCCA; review contracts; represent the program as necessary before the CPUC, other regulatory agencies, and the courts; and to provide overall legal support to the activities of CSDCCA. If the City is a part of a JPA, then separate counsel would be retained, either as a JPA employee or from a qualified outside law firm.

Regulatory. Activities at the major regulatory bodies as well as the legislature can impact virtually all aspects of CSDCCA's or its JPA's operations. To the extent practical and necessary, CSDCCA will work with CCA trade organizations such as California Community Choice Association (CalCCA) to coordinate regulatory and legislative advocacy, to participate on CPUC proceedings and lobbying and communications with state legislators. Nonetheless, there may be times that CSDCCA will need to have its own voice and directly participate in CPUC proceedings or communicate with legislators.

CSDCCA's or its JPA's compliance with regulatory requirements will be coordinated with the department or outsourced vendor providing the service being regulated. For example, Resource Adequacy (RA) and Renewable Portfolio Standard (RPS) compliance is tied closely to power procurement. Thus, the CSDCCA staff overseeing procurement will coordinate with the vendors to ensure compliance with the applicable statutes and regulatory reporting requirements.

Finance

The CCA will need to evaluate the financing options available and the relative costs and benefits of each in consideration of the CCA's risk tolerance. Financing options include:

Direct Loan from City (startup): The City could loan funds from the General Fund for all or a portion of the start up needs. The City would be secured by the CCA revenues once launched. The City would likely assess a risk-appropriate rate for such a loan which is likely higher than the City earns for funds otherwise invested.

Collateral Arrangement from City (startup and ongoing): The CCA could establish an escrow account to backstop a lender's exposure to the CCA. The CCA would agree to deposit

funds in an interest-bearing escrow account which the lender could tap should the CCA revenues be insufficient to pay the lender directly.

Loan from a Financial Institution with Support (startup and ongoing): Another alternative to a direct loan from the City would be for the City to backstop a lender's exposure to the CCA via a letter of credit, loan guarantee, or other promissory. The financial institution would not call upon the City unless the CCA was unable to make payment.

Loan from a Financial Institution without Support (startup and ongoing): At least one CCA, Silicon Valley Clean Energy Authority (SVCEA), was able to use this option to fund ongoing working capital. After members funded a total of $2.7 million in start-up funds, SVCEA has obtained a $20 million line of credit without collateral.

Vendor Funding (ongoing): The City can pursue arrangements with its power suppliers to eliminate or reduce the need for or size of funding for the start-up and operations. This could be a "lockbox" approach, wherein the revenues that SDG&E collects on the CCA's behalf would first go into a secured "lockbox" account, from which the power suppliers would be directly paid. After the power providers are made whole, any remaining revenue would then flow the CCA.

Short-term commercial paper (ongoing): Short-term commercial paper (less than nine months maturity typically) is usually not backed by any form of collateral and as such it is a form of unsecured debt—however only large entities with high-quality debt ratings will find issuers without having a much higher cost for the debt issue. The CCA is a new entity and does not have an established credit history or recognized debt rating and as such access to this instrument would be difficult without the backing of the City's general fund.

Letters of credit (ongoing): These typically would be letters of credit required by the power producers/marketers, with the required level of extreme specificity and additional complexity and rigidity associated with these instruments. Typically, a letter of credit is issued by the entity's existing banker; as a new entity the CCA would need to explore this option with their potential banker(s), and/or have the letter backed by the City's general fund.

Reserves policies

CSDCCA has a policy related to establishing reserves to support its operations. There are two main reserves:

- An operating reserve target level equal to 90 days of operating expenditures and
- A contingency/rate stabilization reserve target level equal to 15% annual revenues.

There are two main reasons for establishing and funding these reserve accounts. First, having enough reserves ensures the long-term financial stability of the program by providing sufficient funds for ongoing operating cash needs, mitigating short-term, unexpected changes in revenues and expenditures, stabilizing rates, and funding future program growth. Second, having a prudent

reserve policy is critical to securing favorable commercial terms with counterparties in power purchase agreements and lenders.

While funding the reserves will increase rates to consumers in the near-term, these reserves will ultimately lower costs to consumers because it will allow CSDCCA to obtain a strong credit rating, thereby reducing the costs for its line of credit and longer-term borrowing.

START-UP SCHEDULE AND MILESTONES

An implementation timeline for a CCA startup in 2021 shown in Table ES-2. The overall schedule is driven by CPUC requirements,[4] which are shown in the second column. While there are number of CPUC requirements for anew CCA, the factors driving the launch of the CCA are: submitting implementation plan for CPUC approval one year prior to launch; meeting the RA requirement filing requirements throughout the year prior to launch; and meeting the customer notification requirements 90 days before launch. The detailed CPUC process is also discussed in the following section.

Although not listed on the table, the CCA must also interact with CAISO. CAISO is an independent non-profit organization which coordinates, controls, and monitors the state's transmission, generation, and electric energy markets. CAISO operates the California wholesale power system which balances the need for higher transmission reliability with the need for lower costs.

[4] Per CPUC Resolution 4907.

Table ES-2: Implementation Schedule

Time	PER CPUC Requirements	COORDINATION WITH SDG&E	Internal CCA
Dec 2018			City Commit to CCA formation
Jan-Dec 2019			Establish City Enterprise or JPA formation
Sept-Nov	Draft Implementation Plan		
Dec-19	File Implementation Plan with CPUC no later than December 2019		Hire CEO, Procurement Manager, Finance Manager, Operations Manager
Jan-20	CPUC notifies SDG&E CPUC confirms it has the Implementation Plan	CSD begins meetings with SDG&E to confirm its operations will conform with SDG&E's tariffs	Issue RFPs for: • Initial power provider • Scheduling coordinator (if separate) • Electronic Data Interchange (EDI)/data management • Communications • Banking/finance services • Working capital loan
Feb-20	CCA provides draft customer notices to CPUC public advisor Within 15 Days, CPUC Program Administrator (PA) finalizes notice and returns to CCA CCA submit registration packet to CPUC (signed serve agreement with SDG&E, Bond amount currently $147,000)		
Mar-20	CPUC informs CCA regarding any Exit Fees If the registration packet is complete, the CPUC confirms Registration as a CCA.		Evaluate Responses to Request For Proposals (RFPs)
Apr-20	April 1: CCA submits year ahead RA forecast		Negotiate with selected firms

Time	PER CPUC Requirements	COORDINATION WITH SDG&E	Internal CCA
May-20			
Jun-20			Have key contracts in place
Jul-20			Begin public roll out
Aug-20	CCA submits its updated year ahead RA forecast	CCA Service Agreement EDI Agreements Electronic Funds Transfer agreements	Set rate policies; Net Energy Metering (NEM)
Sep-20		Issue Binding Notice of Intent	
Oct-20	October 22: CCAs submit their January load migration forecast for the Resource Adequacy program.	EDI Testing	
Nov-20	Nov 1: Send out 1st opt out notice		Lock in power prices
Dec-20	Dec 1: Send out 2nd opt out notice	Dec 1: Receive Customers Mass enrollment information from SDG&E	Set rates/ NEM compensation
	Dec 31: Utility shall transfer all applicable accounts to the new supplier		
Jan-21	Begin service		

I. Program Goals

The City of San Diego (City) is considering forming a Community Choice Aggregation (CCA) service. This Business Plan is not a commitment to move forward with formation, but rather provides a framework if the City chooses to move forward.

A. Rate Competitiveness and Financial Stability

A City of San Diego Community Choice Aggregation (CSDCCA) would expect to offer rates that are competitive with those offered by the incumbent electric utility's, San Diego Gas and Electric (SDG&E). CSDCCA would be committed to providing equitable treatment of all classes of customers without undue discrimination in setting rates. At the same time, the rates would have to generate sufficient revenue to the CSDCCA so all liabilities are covered and it is overaged in a matter consistent with an investment-grade entity. The CCA would not move forward unless there is confidence that both rate competitiveness and financial stability can be achieved.

CSDCCA would also intend to offer long-term rate stability to its customers as well as its maintain its own financial condition. This will be accomplished through conservative phasing in of customers and projects; establishing and maintaining appropriate lines of credit and financial reserves; and contracting with only experienced and financially solid providers of goods and services.

CCA AND SDG&E RATES

A CCA provides only generation services: the actual power that CCA customers use. The incumbant utility, SDG&E, would still deliver the power to the home or business, even though the CCA is providing the power.

Therefore, the CCA customer would still pay the SDG&E delivery rates, but instead of paying SDG&E's generation rates (Schedule EECC), they would pay the CCA's generation rates. CCA customers also pay an additional fee to so that the remaining SDG&E customers are not harmed by the CCA (the "PCIA").

Because a customer pays the same delivery rates no matter how provides their power, the rate comparisons here focus on the CCA rate (plus the PCIA) versus SDG&E's generation rate.

B. Achieve Climate Action Plan Goals

The City's Climate Action Plan (CAP) established an ambitious goal to reduce greenhouse gas (GHG) emissions by 50% by 2035. The CAP identifies five strategies and related actions to achieve the GHG reduction targets (listed below). Strategy 2: Clean & Renewable Energy sets a 100% renewable electricity goal for 2035 and identifies a CCA as a potential mechanism to reach that goal. The five strategies in the CAP are:

1. Energy & Water Efficient Buildings
2. Clean & Renewable Energy
3. Zero Waste (Gas & Waste Management)
4. Bicycling, Walking, and Transit and Land Use
5. Climate Resiliency

The CSDCCA has the potential to meaningfully contribute to achieving many of the goals set forth in the CAP strategies listed above. Most importantly, it will provide

clean and renewable electricity with the goal of providing 100% renewable electricity to the city by 2035. In addition, the CSDCCA will provide programs and strategies to increase the energy efficiency of City-owned and other publicly- and privately-owned buildings, including residential buildings and buildings located in disadvantaged communities, within the City. In addition, as opportunities arise, the CSDCCA will work with organizations such as SDG&E and others to promote programs where further benefits (e.g. emission reductions, job creation, etc.) can be found, such as the electrification of the transportation sector. By striving to achieve these ambitious GHG reduction targets, the City will maintain the downward trajectory in GHG emissions to ultimately meet an 80% reduction by 2050.

It must be noted that California is also moving toward a similar carbon-free electricity policy. Senate Bill 100, which was signed into law by Governor Brown on September 17, 2018, increases the renewable power content requirement of all retail power providers, including utilities and CCAs, from 50% to 60% by 2030. The bill also says, "that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers by December 31, 2045," and that all state agencies regulating electric build this goal into their planning. The net result is that the CAP would achieve carbon free power approximately ten years before the state's target date (2035 versus 2045).

C. Additional Goals

While maintaining rate competitiveness, financial stability, and contributing to the City's CAP are non-negotiable goals, a CSDCCA can serve as a vehicle pursue other goals that benefit the City, its residents and businesses. These include the following.

Economic development. A CCA can provide local economic development in two ways. First, by offering reduced electricity rates, additional dollars can flow into the local economy as households and businesses spend their incomes on items and services other than electricity. Second, the CCA can offer programs that allow households and businesses to reduce the power consumption, such as energy efficiency and distributed energy resources.

Local jobs and employment. Beyond the jobs that result from the economic stimulus of reduced power costs, the CCA can more directly incent and support local job creation. This includes employing residents in CCA administration, using local contractors for energy efficiency programs and distributed energy generation (e.g., rooftop solar installers/maintainers). The CCA can also partner with local community colleges and/or trades apprenticeship programs to support quality local job opportunities.

Prioritization of renewable power development. Beyond support of locally-sited distributed energy generation ("DEG," e.g., rooftop solar), a CCA may put priority on siting larger, grid connected DEG and utility-scale renewable project "locally." As described in the Supply Management section, there will be three levels of localness. The first level would be within the City limits of San Diego. The second level would be within San Diego County but outside of the City. The third level would be adjacent California counties (Orange, Riverside and Imperial Counties). As the CCA's portfolio is developed, subject to cost constraints, projects in the City

would be given highest priority, followed by projects in the County followed by projects in adjacent counties, followed by projects located elsewhere. Project development in Mexico, while feasible and not off the table, would not be considered "local."

Local citizen input and participation. A primary purpose of a CCA is to allow better reflections of community interests and values than can be achieved through an investor-owned utility. This is illustrated in the CSDCCA's fundamental goal of supporting the City's CAP. However, it goes beyond this; the CSDCCA will be committed to providing opportunities for citizens to provide input into its programs and policies.

II. Supply and Market Conditions

A. Load to be served

A fundamental operational role of a CCA is to forecast customer electricity needs in the short, medium and long terms. Power procurement and day-to-day decision-making rely heavily on short-term forecasts of consumer demand for power, while procurement planning requires forecasts of longer-term loads. Procurement must also account for the risks associated with demand forecasting and develop appropriate risk mitigation strategies. Though it is not possible for any entity to predict with absolute certainty future energy demand; logical, data-driven, industry-standard methodologies for load forecasting will be used to provide the foundation of future procurement.

Because CSDCCA is still hypothetical and has yet to sign up, let alone serve any customers, the amount of energy that CCA customers is based on historical consumption data from SDG&E. Of course, if the CCA moves forward the forecast will be continually updated and refined to reflect ongoing economic development in the City, changes in load from energy efficiency and distributed generation.

Figure 1 shows the simple breakdown of the annual electric load in GWhs (millions of kilowatt-hours) for SDG&E. The first column shows the total current load of SDG&E broken down into three categories: residential (homes and apartments), non-

POWER PRIMER

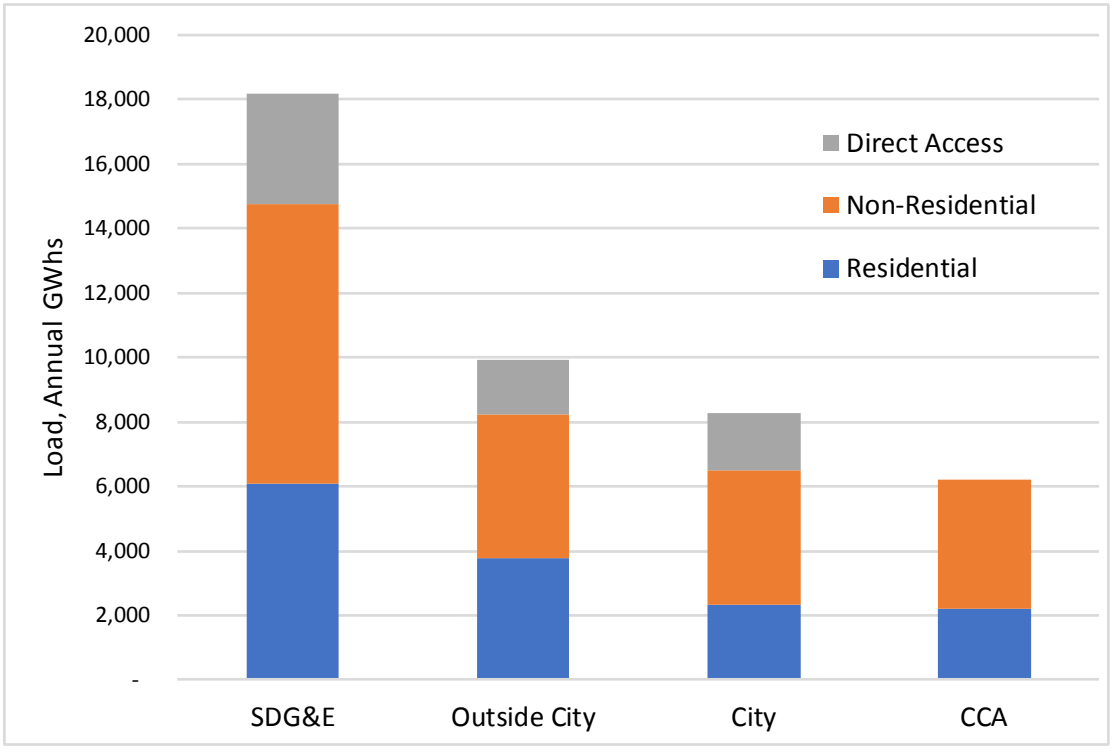
The California Independent System Operator (CAISO) manages the balance between electricity load and supply on its system. Each utility, CCA or energy service provider (ESP) on the CAISO system provides, each day, a forecast of its load and the resources it will be using to meet that load. These load serving entity's (LSE) forecasts are updated throughout the day by the LSE's "scheduling coordinator." The CAISO also maintains markets for power plants to be standing by to meet unexpected load, or to back off production if load is lower than forecast.

For LSE planning and procurement purposes, electricity supply consists of two components: energy in kilowatt hours (kWh), and capacity or demand in kilowatts (kW). Using an analogy of a railroad car: the size of the car represents capacity; and the goods inside the car represent energy. A CCA must purchase both energy (kWh) to meet its customer's consumption needs and capacity to account for customer demand. The CCA must purchase both the correct amount of energy (kWh) and an adequate amount of capacity to meet its customers' energy requirements at all times. As such, the CCA must appropriately forecast both energy usage (kWh) and peak demand (kW) requirements of its customers.

residential (commercial, industrial, street lighting, agriculture) served by SDG&E, and Direct Access (DA). DA consists of commercial and industrial customers that receive their power from third-party, non-SDG&E sources. Currently, about 33% of SDG&E's load is residential, 47% is non-residential served by SDG&E, and 20% is non-residential served by DA.

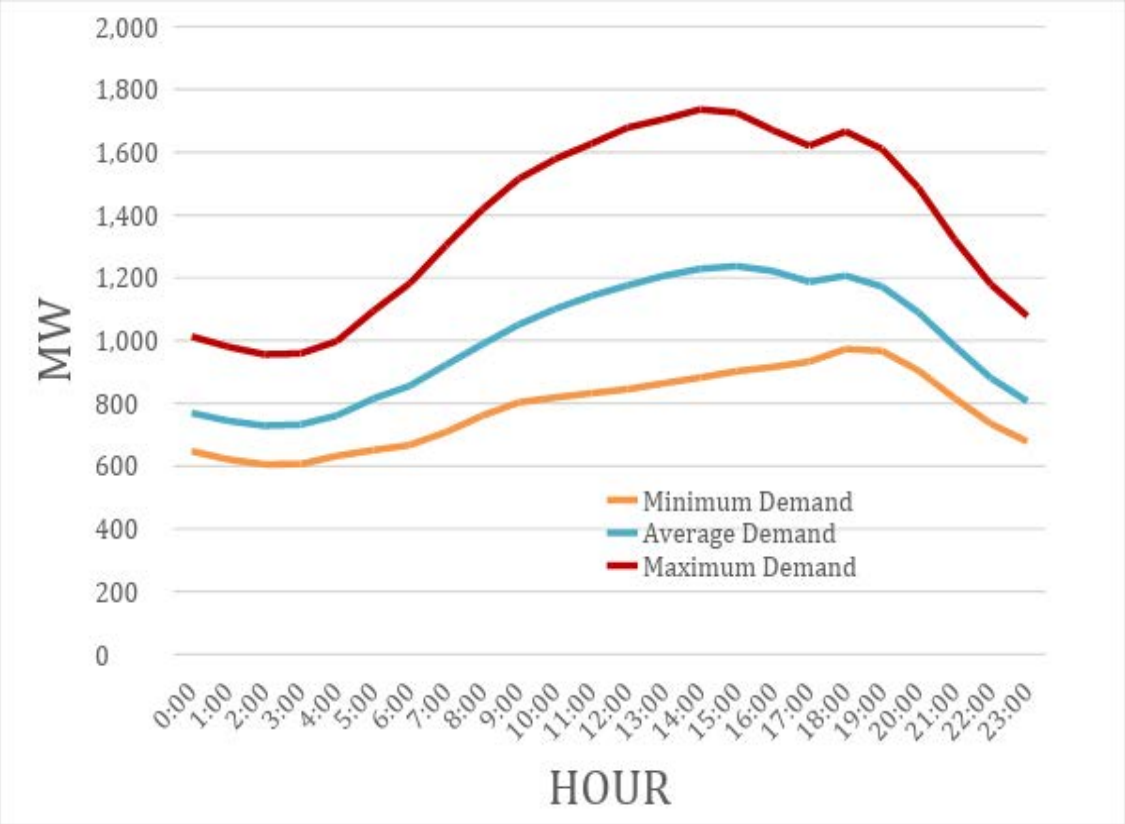
The City's total annual electric load is about 8,200 GWhs, or 45% of SDG&E's total load. The City's breakdown between residential, SDG&E-served non-residential and direct access is about the same as the utility as a whole. The amount of DA service allowed in SDG&E's service area is capped by law. Senate Bill 237 (Hertzberg), signed into law on September 20, 2018, expanded the "cap" on direct access (DA) load by 16% (4,000 GWhs state-wide) and requires the California Public Utilities Commission to provide the legislature recommendations concerning further expansion of direct access. The impact of SB 237 is included in the business plan by assuming a proportional increment DA load would not be served by the CCA. Due to existing contracts with their ESPs, DA customers are not likely to join a CCA. Thus, the pool of possible CCA customers is limited to those currently served by SDG&E. Assuming that 5% of the customers who may join the CCA choose to opt out and remain on SDG&E service, the total load to be served by the San Diego CCA is a bit over 6,000 GWhs.

Figure 1. SDG&E Load Breakdown



Load profiles provide the hourly usage by customers in different rate classes. Figure 2 below illustrates the 24-hour load curve for Weekdays in September based on the SDG&E data. The top of the red line reflects the maximum capacity need for the CCA and is the basis for the CCA's resource adequacy requirement in September.

Figure 2. San Diego CCA Load Shapes



The CCA's load forecast through 2030 reflects the annual average growth rate from the California Energy Commission's most recent electricity demand forecast for SD&E's planning area. This growth rate incorporates load reductions from energy efficiency programs and expected behind the meter distributed generation (e.g., rooftop solar).

B. Supply Market Conditions

Out of necessity, a CSDCCA would rely upon existing resources for its power supply in the first years of service (see side bar). As discussed elsewhere, these resources would initially be provided and coordinated by an outside energy service provider. (As a new entity, a CCA cannot have new projects built prior to formation or the receipt of income; thus, all CCAs have begun service contracting with a power provider to serve the CCA's immediate energy needs, followed by a ramp-up of procurement with new renewable power projects.) After establishment, the CCA could transition into directly contracting with specific power projects, whether they be new renewables or short-term contracts with already existing renewable or conventional resources. Whatever the specific process, the CSDCCA power supply plan will be guided by legislative requirements, regulatory mandates and CCA policies, as well as future market dynamics.

Recently, Senate Bill (SB) 100 was signed into law. SB 100 accelerates the RPS requirements so that all LSEs must procure 60% of their power from renewable resources by 2030 and sets a state-wide policy goal of having 100% of the electric power met by renewable or carbon-free (e.g., large hydroelectric dams) by 2045.

The City of San Diego has established its own goal to achieve 100% renewables by 2035. SB 350 specifically requires that CCAs enter into long-term contracts (of 10 years or more) for at least 65% of their minimum RPS requirement by 2021.

CCA PHASE-IN OF PROCUREMENT

Power plants, including renewable ones, require time to be approved by local and state regulators and be built. CCAs, as new entities cannot have built renewable power projects before they start receiving revenue from their customers. Therefore, for its first few years of operation, most, if not all, of a CCA's power must come from existing resources.

CCAs, including a CSDCCA, are committed to building or contracting with new renewable generators to further their and the State's climate action goals. Thus, once a CCA is up and running, it puts out requests for contracts with new renewable generators. For example, Peninsula Clean Energy in San Mateo County has 300 MW of new solar generation in development, even though they only began service in 2017.

The cost of renewable energy from solar photovoltaic (PV) facilities has steadily fallen since the establishment of the California RPS mandate in 2002. Looking forward, solar PV prices are expected to continue to decline, although perhaps at a slower rate as the technology matures and if import tariffs continue to be applied. At the same time, the incremental value of solar energy is decreasing as more and more solar resources are added to the electrical system, leading at times to conditions where solar energy must be curtailed to avoid overgeneration. Thus, there are advantages to a diversified supply portfolio including wind, geothermal and biomass, as well as energy storage.

Assembly Bill (AB) 251 requires LSEs to procure energy storage capacity. The storage mandate was implemented by the California Public Utility Commission (CPUC) through a requirement that CCAs procure energy storage equal to one percent of their forecasted 2020 peak load. CCAs must demonstrate progress towards meeting this target in biennial advice letter filings and must

have the energy storage capacity in place by 2024. Some energy storage technologies, especially lithium-ion batteries, have fallen steeply in cost in recent years, though they are still relatively expensive compared to supply resources and demand response. Battery costs are expected to continue to fall, suggesting there is a benefit to deferring procurement until required by the mandate.

CCAs are also responsible for complying with Resource Adequacy (RA) obligations required under Assembly Bill 380. Load serving entities must contract for 115% of their projected peak demand to meet the system RA requirement. A separate local RA requirement must also be met by LSEs with customers in local reliability areas. The local RA requirement in determined by the California Independent System Operator (CAISO). Finally, there is a mandate to purchase flexible capacity. The required quantities and operating criteria are also determined by the CAISO. All utilities, CCAs, and Direct Access providers must demonstrate purchase of 90% of their flexible RA requirement in an annual RA filing, and 100% of the requirement in their monthly RA filings.

There is a bilateral market for RA capacity, with standardized products for system, local and flexible RA capacity. The RA mandates can also be met through RPS contracts, as well as with resources that are contracted under tolling agreements that provide both capacity and dispatchable energy. Variable renewable resources are assigned net qualifying capacity based on their effective load-carrying capacity (ELCC).

There is currently an excess supply of both system and flexible capacity in the market, leading to depressed prices for these products. These products are contracted on a short-term basis (i.e., month- or year-ahead). There is an active stakeholder process at the CAISO considering changes to the flexible RA program, including establishment of faster ramping requirements and other enhancements. Once completed in the next year or two, the new flexible RA program will be reflected in future RA requirements by the CPUC and may reduce the amount of existing resources that qualify to provide flexible RA in 2020 and beyond. This may have the effect of increasing future prices for flexible capacity and perhaps stimulating demand for new flexible resources. The glut of system RA capacity is expected to persist given the addition of renewable capacity to meet RPS requirements, although ELCCs for solar will likely fall as additional capacity becomes less effective at meeting peak demands.

State forecasts suggest that by approximately 2030, the excess capacity will no longer exist, and additional capacity would be needed. This is reflected in our forecasts by a marked increase in the market prices of RA beginning in 2028.

In addition to the supply portfolio controlled by the CSDCCA or its supply agent, the CSDCCA's energy loads will also be met through system purchases necessary to balance supply and demand on an hourly and real-time basis. These system purchases reflect the resource mix of the entire grid, meaning that GHG emissions associated with that amount of generation would be assigned to the CCA. These emissions would need to be offset through renewable energy credits or other measures if the CCA were to seek to provide 100% GHG emission free supply.

C. Phasing Options

As part of a prudent development and expansion plan, CSDCCA will phase in service over time. This gradual expansion will allow CSDCCA to phase in operational costs and resource procurement. It will also allow CSDCCA to make mid-course corrections if necessary to successfully offer services to all potential customers.

Virtually all existing CCAs throughout California have had some degree of phased-in launch, though the specifics have varied. At one end of the spectrum, CleanPowerSF is taking 4 years or more to include all its potential customers. At the other end, Peninsula Clean Energy (San Mateo County) was serving all its customers in less than one year. The Clean Power Alliance—the CCA covering Los Angeles and Ventura Counties—had a modest initial roll out (municipal, commercial and industrial customers in unincorporated Los Angeles County) in June 2018, followed by a planned full rollout throughout 2019 such that its full load (approximately 15,000 GWh and 2,700 MW) would be served by January 2020.

The actual phasing details of the roll-out of the CSDCCA would be determined in the year prior to implementation of the first phase. Consistent with other CCAs, the CSDCCA might offer initial service to municipal and selected large commercial and industrial accounts. This would allow the CCA to achieve significant cash flow—larger accounts mean more energy and thus more payments—while keeping the number of accounts, and thus transactions, to a minimum until the data exchange and billing protocols are fully worked out. The remainder of the load would be phased in, either in a single tranche in multiple tranches over the following 6 to 18 months.

While the phase-in described above is consistent with many CCAs, in practice additional phases will be predicated on CSDCCA meeting milestones and internal metrics that are established prior to the roll-out of the phase. These could include:

- Ability to offer rates to customers that are sufficient to cover program costs and are competitive with SDG&E's generation rate inclusive of all additional costs, such as exit fees;
- Supply commitments are sufficient to meet projected load resulting from existing plus new customer enrollment;
- Staff and systems and/or qualified third parties can handle additional volumes and accounts; and
- Sufficient credit/collateral and working capital support for incremental growth.

Only after meeting or exceeding these metrics and milestones will CSDCCA move forward with additional phase(s).

As noted, electric accounts in San Diego may choose to remain on SDG&E service, known as opting-out of CCA. CSDCCA assumes that 5 percent of the initial enrolled customers will opt-

out and continue to receive commodity service from SDG&E.[5] This is a conservative estimate; the initial opt-out rate experienced by MCE, the first CCA launched in California, was around 15 percent. More recent CCAs have seen opt-outs on the order of three to five percent.

III. Pro Forma

A. Assumptions

This section outlines the main elements of the pro forma analysis, the assumptions underlying the elements and the output results. The analysis also includes a comparison between the generation-related costs that would be paid by CSDCCA customers and the generation-related costs that would be paid by SDG&E bundled service customers. Costs paid by CCA customers include all CCA-related costs (i.e., supply portfolio costs and administrative and general costs) and exit fee payments that CCA customers will be required to make to SDG&E.

The assumptions update and expand upon those presented in the Feasibility Study.[6] They are here for general analysis purposes and will be updated should the City choose to launch a CCA as updated cost data becomes available or more accurate estimates can be made closer to when decisions are executed.

1. Start-up Costs

Startup costs are the costs the CSDCCA will incur before operations begin**.** Table 1 shows the estimated CCA startup costs. They are based on the experience of the existing CCAs as well as from other CCA feasibility assessments. The values shown assume a City-only CCA. The values for a CCA extending beyond the City, but for the JPA formation/development costs, would be similar but likely modestly higher.

[5] This differs from the 15 percent opt-out rate assumed in the CCA Feasibility Study, as more recent history suggests that the 15 percent value is unrealistically conservative.

[6] *See*, Willdan Financial Services and EnerNex, "Feasibility Study for a Community Choice Aggregate" Final Draft July 2017; and Mark Fulmer and David Howarth, Memorandum to the City of San Diego: "Peer Review of 'Community Choice Aggregate Feasibility Study' Draft Report Dated April 6, 2017." February 22, 2018. Both are available at: https://www.sandiego.gov/sustainability/clean-and-renewable-energy.

Table 1. Estimated Start-Up Costs

Item	Cost	One-time or Ongoing?
Technical Study	$150,000	One-time
JPA Formation/Development	N/A[7]	One-time
Implementation/Business Plan Development	$200,000	One-time
Power Supplier Solicitation & Contracting	$100,000	Ongoing
Staffing	$1,500,000	Ongoing
Consultants and Legal Counsel	$700,000	Ongoing at reduced level
Marketing & Communications (incl. out-out)	$700,000	Ongoing at reduced level
SDG&E Service Fees	$50,000	Ongoing at reduced level
CCA Bond	$150,000	One-time
Equipment and lease	$1,000,000	Ongoing
Miscellaneous (contingency)	$500,000	Ongoing at reduced level
Total	$5,000,000	
Working Capital	$100,000,000	One-time. Total amount after full phase-in.
Total	**$105 million**	

Working capital reflects the fact that a business will have bills to pay prior to receiving payment from its customers. This amount would cover the timing lag between when invoices for power purchases (and other account payables) must be remitted and when income is received from the customers. Per industry standard, total working capital is set to equal three months of CCA revenue, or approximately $105 million when the CSDCCA is fully operational (i.e., serving all potential customers.)[8] If the City phases in its customer enrollment, the amount needed for each phase is proportional the annual revenue that would be generated in that phase. Thus, if the first phase is serving only 25% of the load, the initial working capital needs would be 25% of $105 million or $26 million.

Initially, the working capital is provided by a bank on credit to the CCA. Typical power purchase contracts require payment for the prior month's purchases by the 20th of the current month. Customers' payments are typically received 60 to 90 days from when the power is delivered.

[7] Modest additional costs would be incurred to develop JPA documents if the City were to pursue JPA formation with its neighboring communities.

[8] CCAs frequently "phase-in" their service, initially offering service to a smaller subset of customers and then expanding service to the remaining customers over the following months or years.

These startup costs are assumed to be financed over 5 years at 6% interest.[9] Historically, CCAs have paid down their start-up loans much more quickly.

2. Administrative and General Costs (ongoing)

Administrative and general costs cover the everyday operations of the CCA, including costs for billing, data management, customer service, employee salaries, contractor payments, and fees paid to SDG&E. Table 2, below summarizes the estimated ongoing administrative and general costs. These costs are assumed to trend with inflation (e.g., escalate at about 2% per year).

Table 2. Ongoing Administrative and General Costs

	Cost
SDG&E Metering and Billing Fees, $/cust/month	$0.06
Data Management Fees $/customer/month	$1.88
Administration - Labor	$2,500,000
Administration- Non-Labor	$1,000,000
Professional Services	$3,500,000
Data Management Fees	$8,863,814
SDG&E Metering and Billing Fees	$263,382
Total	$16,127,196

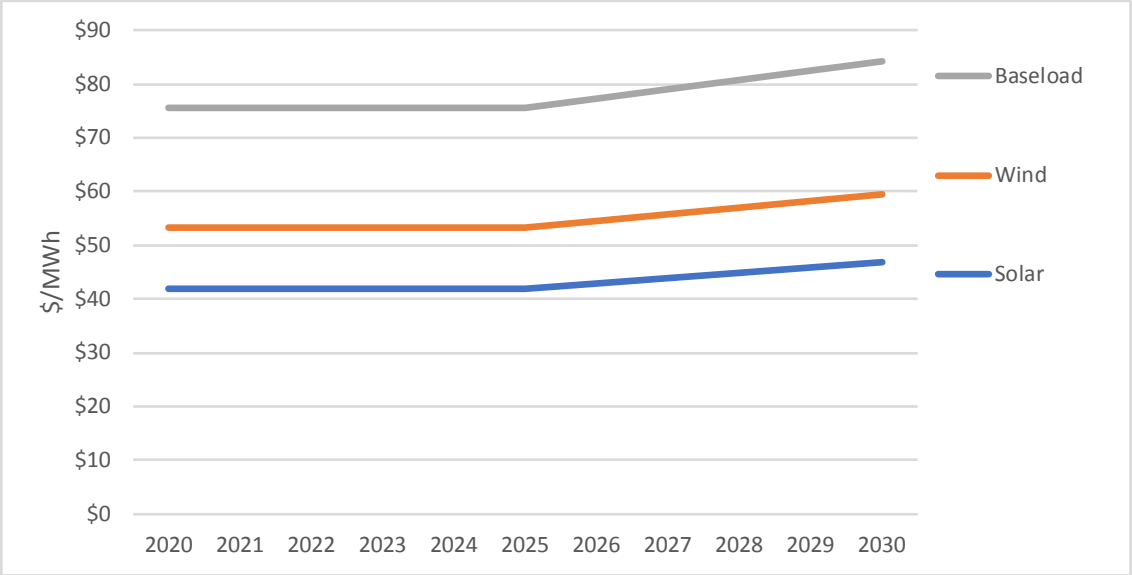
3. Renewable Power Costs

For this analysis, the Study assumes that the CCA will receive 45% of its renewable energy from utility-scale photovoltaic solar plants, 45% from wind turbines, and 10% from geothermal, biomass or some other baseload renewable. This reflects a reasonable balance of renewable resources: wind and solar are generally complementary in California—that is, when solar output is high, wind output is low. Additional firmer renewables, although most costly, allows for easier operations and hedges against solar curtailment during high output hours. This ratio is assumed throughout the analysis, although in practice it will be adjusted to reflect the actual CCA's RSP portfolio.

Assumed renewable prices are shown in Figure 3. The renewable costs are assumed to remain approximately flat though 2025, and then escalate at 2% per year thereafter. The starting values are consistent with current reported renewable contract prices from other California CCAs and municipal utilities, with trends consistent with those reported by the US Department of Energy's Energy information Administration forecasts.

[9] 6% is approximately the prime rate plus 100 basis points.

Figure 3. Projected Average Renewable Power Costs



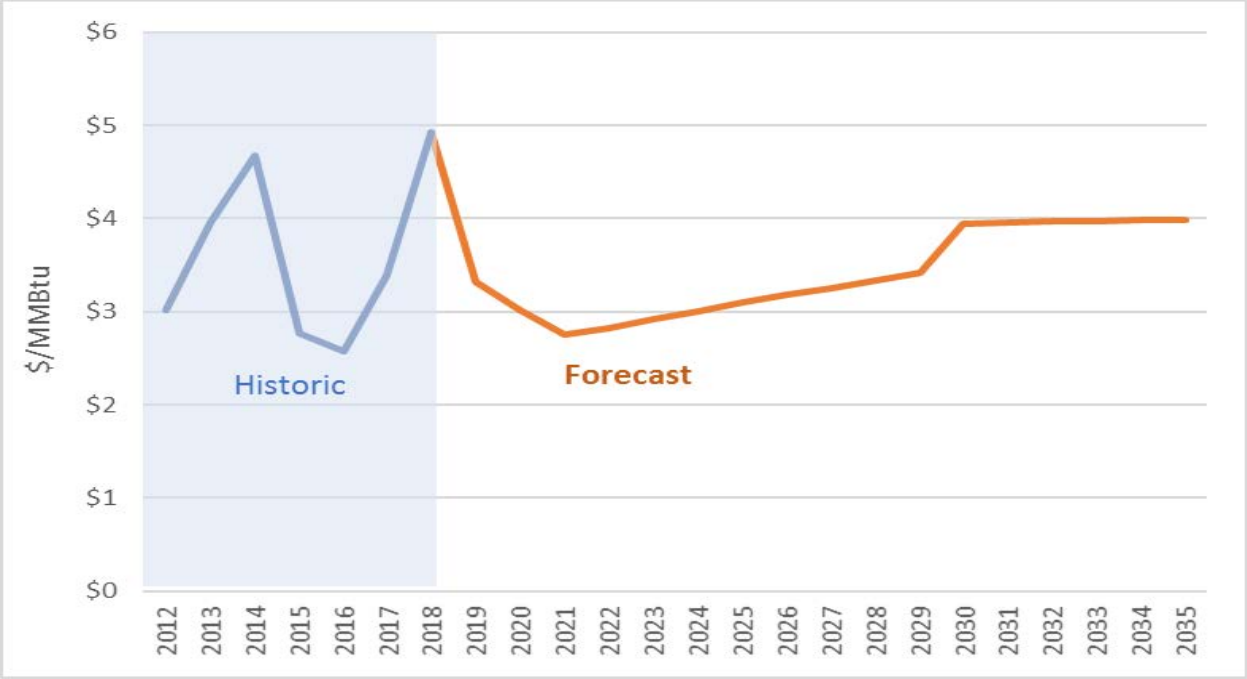
Note also the actual effective cost to the CCA of renewable power is greater than the power prices shown in Figure 3. This is because there will be frequent times when the CCA is generating more renewable power (generally solar) than the CCA's customers are consuming. At those times, the power must be sold onto to open market (with or without the associated Renewable Energy Credits (RECs)) or simply be curtailed. Lastly, there are 6% line losses in delivering the power from the renewable generators to the CCA customers.[10] Combined, these factors increase the average cost of RPS power from $51/MWh to $61/MWh.

4. Other Power Costs

Wholesale market prices for electricity in California are largely driven by the cost of operating natural gas power plants, since these plants typically have the highest operating costs and are the marginal units. Market prices are a function of the efficiency of the marginal generators, the price of natural gas, and the cost of GHG allowances. The assumed underlying cost of natural gas is shown in Figure 4, below. The near-term prices are based on the forward prices published by the Intercontinental Exchange (ICE), with the long-term prices based on natural gas escalations from US Department of Energy's Energy information Administration forecasts.

[10] For simplicity's sake, this analysis assumes the least-cost (i.e., remote) sources of renewable power. In practice, the CCA will weigh the trade-offs, including reduced losses, of siting renewable resources closer the San Diego versus the general cost benefits of remotely-located renewable power.

Figure 4. Projected Natural Gas Prices



5. Capacity Costs

As noted above CCAs are also responsible for complying with Resource Adequacy (RA) obligations. There is currently an excess supply of both system and flexible capacity in the market, leading to depressed prices for these products. These products are contracted on a short-term basis (i.e., month- or year-ahead). Thus, in the near term—from 2020 through 2027, we assume capacity cost to remain low: from $3.50-$4.00 per kW-month. By 2030, we assume that the capacity glut will be filled (due to increased intermittent renewables and the retirement of aging fossil plants. This will increase the capacity costs to something closer to the cost of a new combustion turbine, around $30/kW-month.

6. Reserves

To establish the CSDCCA rate, the minimum CCA rate, can be adjusted, if needed, based on the competitive position of the CCA. In particular, when the total CCA customer rate (i.e., the minimum CCA rate plus the SDG&E exit fee) was below the projected SDG&E generation rate, the minimum CCA rate was increased up to the amount needed to meet the reserve refund targets while still maintaining a discount. The surplus CCA revenue from these rate increases was used ("Reserve Fund") to maintain CSDCCA competitiveness with SDG&E rates in years in which total CCA customer rates could otherwise be higher than SDG&E generation rates. For this study, we assume a 15% rate reserve target is set, with excess "headroom" (i.e., the difference between the total target CCA rate and the SDG&E generation rate) going towards the rate reserve fund.[11] After the reserve target is met, it is held at the target level or drawn upon so that

[11] Fifteen percent rate stabilization reserves is the CCA norm in California.

the desired CCA rate is achieved. If the reserve is drawn upon, then the next year in which headroom is available, the rate reserve is replenished.

7. Power Charge Indifference Adjustment

The Power Charge Indifference Adjustment (PCIA) is a fee charged by SDG&E intended to prevent customers that remain with SDG&E bundled service from paying for energy generation procured on behalf of customers that have since switched to CCA service. More specifically, it pays for the above-market costs of SDG&E generation resources that were acquired, or which SDG&E committed to acquire, prior to the customer's departure to CCA. The total cost of these resources is compared to a market-based price benchmark to calculate the "stranded costs" associated with these resources, and CCA customers are charged what is determined to be their fair share of the stranded costs through the PCIA. Bundled customers also pay the PCIA, which is embedded into their commodity portion of their total rate.

The PCIA is not paid directly by the CCA, but by the individual customers taking CCA service. Thus, it does not appear explicitly on the CCA's books, however it must be accounted for in any CCA cost analysis. While both CCA customers and customers that choose to remain in SDG&E bundled service pay this fee, it appears as a separate line item for CCA customers and is embedded in the energy generation costs of SDG&E bundled customers.

To forecast the PCIA, this study used the formula and approach dictated by the Alternative Proposed Decision of Assigned Commissioner Carla Peterman in Commission Rulemaking 17-06-026, which was approved by the Commission on October 11, 2018. In addition, the market price and SDG&E portfolio assumptions used in the PCIA calculations are consistent with those used to forecast SDG&E's generation rates.

This study forecasts the PCIA charge by directly modeling expected changes to PCIA-eligible resources and to the market-based price benchmark through 2035. Based on our modelling, we expect the PCIA to remain between 2.0¢ and 2.5¢ per kWh through 2026. After 2027 the PCIA is modeled to decrease markedly until it is nil in 2030.[12] The decline is a combination of two factors. First, in the late 2020's and early 2030's, many of the costlier renewable power contracts entered into by SDG&E expire, which decreases the total stranded costs. Second, and more important, the large increase in the cost of capacity is reflected in the market price benchmark. Because of the eight-fold increase in capacity costs, the SDG&E portfolio would no longer generate any net above-market costs to be spread to the CCA via the PCIA. (A more conservative case is also explored in the sensitivity section.)

MRW's forecast of the PCIA charge through 2035 is shown in Figure 5.

[12] It could, in fact, be negative after 2030, but for the conservatism, the modeling assumes that it does not go below zero.

Figure 5. Forecast Average PCIA

B. Results

1. Pro forma

The pro forma results for the first 10 years of the CSDCCA are is summarized in Table 3 below. While a full pro forma through 2035 is modeled and included in the appendix, the uncertainty in the forecast elements make the latter 15 years less pertinent for a business plan. The first section of the pro forma summarizes the two major expense components: the cost of power and the cost of administration/operations. The next line shows the debt service, which is the annual amounts in 2021 through 2025 for paying down the assumed financing of the startup costs. The total revenue requirement—the amount that the CCA would need to collect from its customers to meet its minimum financial obligations—is the sum of the expenses and debt service.

The next section calculates the average rate that the CCA would have to charge to meet its revenue requirement. The PCIA is then added to the CCA's generation rate to arrive at the total average cost of CCA service to the CCA customer. The following line shows the SDG&E generation rate. The difference between the Total CCA Customer Rate and SDG&E Average generation rate is the "headroom": the incremental amount that CCAs can charge to pay for reserves and other customer programs while still offering rates equal to or less than SDG&E.

The last section in Table 3 summarizes the start-up debt service assumptions.

Table 4 summarizes the assumptions and calculations behind the cost of power, including delineating each major cost component.

Table 3. Base Pro Forma, 2020-2029

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenses										
Cost of Power (including losses)	$381,691,500	$368,556,835	$381,727,848	$393,083,506	$403,505,012	$413,360,627	$427,888,652	$443,262,805	$541,456,341	$634,454,676
O&M/A&G Costs	$16,127,196	$16,125,624	$17,114,854	$17,548,899	$17,985,101	$18,403,161	$18,774,799	$19,139,255	$19,486,989	$19,823,282
Total Expenses	**$397,818,696**	**$384,682,460**	**$398,842,702**	**$410,632,405**	**$421,490,113**	**$431,763,788**	**$446,663,451**	**$462,402,060**	**$560,943,329**	**$654,277,958**
Debt Service	**$0**	**$24,473,736**	**$24,473,736**	**$24,473,736**	**$24,473,736**	**$24,473,736**	**$0**	**$0**	**$0**	**$0**
Total Revenue Requirement	**$397,818,696**	**$409,156,196**	**$423,316,439**	**$435,106,141**	**$445,963,849**	**$456,237,525**	**$446,663,451**	**$462,402,060**	**$560,943,329**	**$654,277,958**
Total Load, MWh	6,388,879	6,371,108	6,433,086	6,436,380	6,440,858	6,434,106	6,408,037	6,371,172	6,333,960	6,291,918
SDG&E CCA Customer Charges, $/MWh (before Reserve Fund Adjustment)										
Average CSD CCA generation	$62.3	$64.2	$65.8	$67.6	$69.2	$70.9	$69.7	$72.6	$88.6	$104.0
SDG&E average exit fees for CCA load	$22.5	$23.8	$22.0	$21.3	$21.4	$21.5	$20.1	$18.8	$13.3	$7.9
Total CCA customer rate	**$84.7**	**$88.0**	**$87.8**	**$88.9**	**$90.7**	**$92.4**	**$89.8**	**$91.4**	**$101.9**	**$111.9**
SDG&E average gen rate for CCA load, $/MWh	**$97.7**	**$96.7**	**$96.9**	**$98.2**	**$102.2**	**$103.8**	**$105.0**	**$105.7**	**$109.3**	**$115.9**
Reserve Fund Adjustment	15%									
Target	$59,672,804	$61,373,429	$63,497,466	$65,265,921	$66,894,577	$68,435,629	$66,999,518	$69,360,309	$84,141,499	$98,141,694
Reserve Fund Adjustment										
Potential Reserve potential	$83,002,156	$55,774,985	$58,648,408	$59,613,189	$74,456,626	$73,690,465	$97,539,442	$90,989,287	$47,467,977	$25,355,753
Potential Reserve additions	$59,672,804	$1,700,625	$2,124,036	$1,768,455	$1,628,656	$1,541,051	$0	$924,680	$14,781,190	$14,000,194
Subtractions from reserve fund	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Reserve fund total	**$59,672,804**	**$61,373,429**	**$63,497,466**	**$65,265,921**	**$66,894,577**	**$68,435,629**	**$68,435,629**	**$69,360,309**	**$84,141,499**	**$98,141,694**
CSD CCA Customer Charges, $/MWh (with Reserve Fund Adjustment)										
Rate adjustment from Reserve Fund	$9.3	$0.3	$0.3	$0.3	$0.3	$0.2	$0.0	$0.1	$2.3	$2.2
Average CSD CCA rate	$71.6	$64.5	$66.1	$67.9	$69.5	$71.1	$69.7	$72.7	$90.9	$106.2
SDG&E average exit fees for CCA load	$22.5	$23.8	$22.0	$21.3	$21.4	$21.5	$20.1	$18.8	$13.3	$7.9
Total CCA customer rate	**$94.1**	**$88.2**	**$88.1**	**$89.2**	**$90.9**	**$92.6**	**$89.8**	**$91.5**	**$104.2**	**$114.1**

Debt service

Start-up costs	$5,000,000
working Capital	$98,092,281
Total	$103,092,281
Interest rate	*6%*
term, years	5

Table 4. Base Pro Forma Supply Details

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
CCA Load Forecast (MWh)	6,772,211	6,754,441	6,816,419	6,819,713	6,824,191	6,817,438	6,791,370	6,754,505	6,717,293	6,675,251
RPS %										
1. SB 350 RPS Requirement	33%	40%	42%	43%	45%	47%	48%	50%	52%	53%
2. Accelerated RPS	50%	52%	55%	57%	60%	63%	66%	69%	72%	76%
Renewable Requirement (MWh)	3,386,105.75	3,536,943.15	3,738,209.34	3,916,896.39	4,104,836.20	4,294,716.97	4,480,633.29	4,667,068.51	4,860,865.92	5,058,893.93
Renewable Portfolio (%)										
Wind	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%
Solar	45%	45%	45%	45%	45%	45%	45%	45%	45%	45%
Baseload (e.g., Geothermal)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Large Hydro/Market (% of non-R	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Renewable Portfolio (MW)										
Wind	550	575	608	637	667	698	728	759	790	822
Solar	710	742	784	822	861	901	940	979	1,020	1,061
Baseload (e.g., Geothermal)	43	45	47	50	52	54	57	59	62	64
Portfolio (MWh)										
Wind	1,523,748	1,591,624	1,682,194	1,762,603	1,847,176	1,932,623	2,016,285	2,100,181	2,187,390	2,276,502
Solar	1,523,748	1,591,624	1,682,194	1,762,603	1,847,176	1,932,623	2,016,285	2,100,181	2,187,390	2,276,502
Baseload (e.g., Geothermal)	338,611	353,694	373,821	391,690	410,484	429,472	448,063	466,707	486,087	505,889
Large Hydro/Market	-	-	-	-	-	-	-	-	-	-
Excess RE Sold (keep RECs)	39,657	54,611	74,378	98,069	126,601	159,933	197,933	240,778	289,271	343,774
Makeup RECs Purchases	39,657	54,611	74,378	98,069	126,601	159,933	197,933	240,778	289,271	343,774
Total Market Purchases	3,465,420	3,326,719	3,226,966	3,098,955	2,972,557	2,842,587	2,706,603	2,568,992	2,434,969	2,303,905
Price Forecasts ($/MWh)										
Wind	53.35	53.35	53.35	53.35	53.35	53.35	54.55	55.80	57.00	58.21
Solar	42.01	42.01	42.01	42.01	42.01	42.01	42.96	43.94	44.89	45.83
Baseload (e.g., Geothermal)	75.50	75.50	75.50	75.50	75.50	75.50	77.20	78.96	80.67	82.37
Market Renewables	55.57	55.57	55.57	55.57	55.57	55.57	56.82	58.11	59.37	60.62
Market Purchases (w/o GHG)	26.59	24.76	25.30	26.11	26.65	27.26	27.81	28.53	29.28	30.01
Wholesale GHG cost	6.30	6.72	7.21	7.76	8.25	8.80	9.39	10.09	10.83	11.64
Market Purchases (w GHG)	32.89	31.48	32.50	33.87	34.90	36.06	37.19	38.62	40.11	41.65
Portfolio Costs ($)										
Wind	81,291,934	84,913,163	89,745,061	94,034,890	98,546,855	103,105,418	109,997,524	117,185,807	124,686,707	132,508,515
Solar	64,012,636	66,864,142	70,668,978	74,046,968	77,599,876	81,189,477	86,616,607	92,276,959	98,183,478	104,342,694
Baseload (e.g., Geothermal)	25,565,098	26,703,921	28,223,480	29,572,568	30,991,513	32,425,113	34,592,578	36,853,185	39,212,106	41,671,948
Large Hydro	-	-	-	-	-	-	-	-	-	-
Makeup RECs Purchases	899,037.37	1,315,150	1,715,272	2,127,147	2,615,638	3,119,753	3,884,445	4,693,969	5,571,009	6,523,675
Wholesale Market Purchases	113,342,164	103,874,613	103,679,042	103,315,429	101,546,242	99,615,499	96,989,832	94,564,079	91,866,101	88,792,348
Capacity Market Purchases	60,311,302	49,864,609	51,423,233	52,634,678	53,862,781	54,626,755	55,148,564	55,568,810	130,486,337	200,327,948
CAISO costs	18,998,219	18,344,458	19,000,029	19,565,242	20,083,960	20,574,511	21,297,625	22,062,855	26,950,316	31,579,192
Total Cost ($)	**381,691,500**	**368,556,835**	**381,727,848**	**393,083,506**	**403,505,012**	**413,360,627**	**427,888,652**	**443,262,805**	**541,456,341**	**634,454,676**
Total Cost Renewable	189,804,420	198,674,995	210,339,834	220,758,637	231,778,040	242,922,936	259,775,724	277,365,963	295,756,897	314,976,749
Total Cost non-Renewable	101,654,920	90,875,914	90,052,143	89,259,864	87,404,398	85,558,070	83,208,953	81,227,186	79,288,721	77,331,289
Total Cost GHG	23,588,171.52	23,905,533.61	24,513,198.10	24,903,684.84	24,804,199.76	24,517,057.14	23,964,810.94	23,266,121.42	22,223,319.93	20,784,255.29
Total Cost Capacity	66,643,988.80	55,100,392.57	56,822,672.75	58,161,319.33	59,518,373.54	60,362,564.24	60,939,163.47	61,403,534.62	144,187,402.00	221,362,382.51

2. SDG&E Rate Forecast

Forecast of SDG&E's generation rates and exit fees are necessary to compare the projected rates that customers would pay as CSDCCA customers to the projected rates and fees they would pay as bundled SDG&E customers.

To ensure a consistent and reliable financial analysis, a 16-year bottoms-up forecast of SDG&E rates was developed using market prices that are consistent with those used in the forecast of the CSDCCA's supply costs. The forecast of the costs includes SDG&E's existing resource portfolio, adding in market purchases only when necessary to meet projected demand.

To develop this forecast, the key cost drivers of each of SDG&E's generation rate components were examined, separately evaluating costs for renewable and non-renewable energy purchases, for SDG&E-owned generation facilities, and for capacity purchases. The study assumed that near-term changes to SDG&E's generation portfolio would be driven primarily by modest increases in underlying gas market prices. In 2028-2030, consistent with the CSDCCA forecast, the SDG&E must pay higher prices for incremental capacity and resource adequacy, reflecting the tightening of the capacity market at that time.

The forecast further assumes that SDG&E is compliant with the renewable and carbon-free requirements recently ordered in Senate Bill 100: a minimum of 60% renewable content in 2030 and a trajectory that would, when extrapolated, result in carbon-free power in 2045. In fact, given the current SDG&E renewable portfolio and the loss of load from the CSDCCA, SDG&E would need minimal if any new renewables to meet the 2030 goal.

The forecast for SDG&E's generation resources are based on publicly available data and forecasts. Like with the CCA cost forecast, major inputs include NYMEX gas price forwards, a long-term natural gas price forecast from the U.S. Energy Information Administration, SDG&E's January 2018 forecast of the annual cost from its current portfolio of renewable generation, recent publicly reported market prices for renewable generation sales in California, a National Renewable Energy Laboratory forecast of solar prices, the CPUC report on recent Resource Adequacy capacity prices in northern California, and the California Energy Commission's forecast of the price to build a new combustion turbine plant.

Over the 16-year period, the study forecasts that SDG&E's generation rates will escalate by an average of 2.9% per year. Escalation rates are expected to vary significantly over the course of this period. During the initial period from 2020-2027, rates generally are expected to increase by an average of 1.1% per year. Beginning in 2028, generation rates are expected to increase at a much faster rate (+4.1% per year) due primarily to an increase in capacity costs to account for the need for resources additions.

3. Rate Comparisons

Figure 6 shows the Base Case forecast of average CCA costs and SDG&E's generation rates. The bars in the chart show the forecasts of the major cost components of CCA operation, while the single line shows the forecast of SDG&E's generation rate. When the bars are below the line, the CCA's average operating costs will be below the SDG&E generation rate; meaning that it can offer power to customers at a rate lower than or competitive with SDG&E.

The bottom-most green segment represents the cost of renewable power to the CCA. The renewable power costs ramp up with increasing renewable content, such that by 2035, when 100% of the power is met renewably, roughly two-thirds of the costs are for the renewable power.

The brown segment is for the costs of non-renewable, wholesale market power. This segment slowly decreases, as renewable power increases. It does not completely go away, even in 2035 when the CCA's resources are "100%" renewable, because there will still be a need for generating power when renewables are not available. (The portfolio is still net 100% renewables, as renewable power generated in excess of the CCA's needs, such as sunny afternoons, offset the non-renewable market purchases.) Note that by 2035, battery storage technology may well be advanced enough so accomplish this instead, however explicit forecasts have not been made concerning the adoption and technological maturation (i.e., costs).

The blue segment is for capacity. That is, the CCA must demonstrate that it has the generating capacity (in megawatts) to ensure that it can serve all of its load, even if the "intermittent" renewable resources are not generating at their optimal rate (e.g., solar on rainy days). The more intermittent renewables—solar and wind—that are added to the CCA's generating mix, the more back-up capacity is needed to ensure reliability. As noted above, in the near term when there is a glut of capacity in California, from 2020 through 2027, capacity costs to are low: less than 1¢/kWh ($3.50-$4.00 per kilowatt-month). By 2030, the capacity glut will be filled (due to increased intermittent renewables and the retirement of aging fossil plants. This will increase the capacity costs to something closer to the cost of a new combustion turbine, around 5¢/kWh ($30/kW-month). These increased capacity costs are experienced by both the CCA and SDG&E—hence the increase for both entities in rates from 2028 to 2030.

The gray segment is for operations and debt service. That is, from 2021 through 2024 the loans associated with the start-up costs are paid down.

UNCERTAINTIES

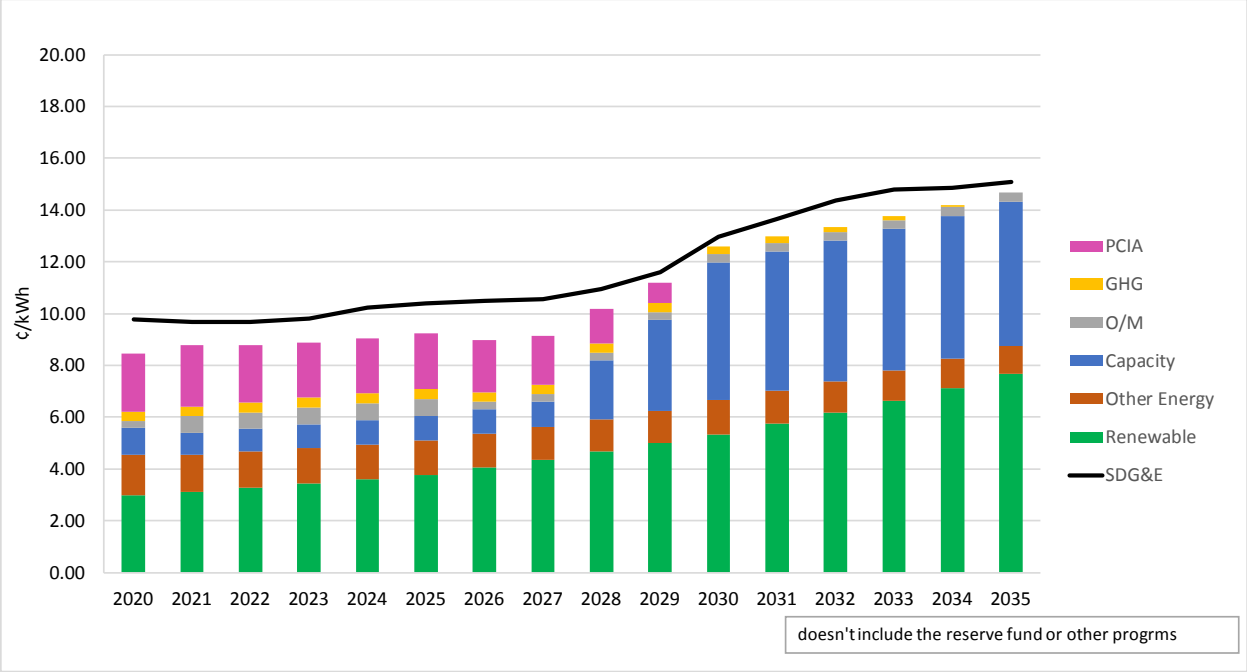
These comparisons are forecasts based on the best public data available. There is considerable uncertainty caused by not knowing how SDG&E would change its procurement practices in response to departure of the City's load to CCA. There is further compounded uncertainty after 2027, as the cost of capacity, a factor not important in the near term, becomes a driver of rate increases. Lastly, unknowable technology change, such as the pace and cost of the development of battery storage, can impact the forecasts of latter years. Nonetheless, because common assumptions are used across both SDG&E and the CCA, the relationship between the rates should approximately hold.

The orange segment is for carbon cap and trade allowances. Because the CSDCCA's procurement is set to meet the City's Climate Action Plan of 100% renewable by 2035, the orange segment becomes nil by the end of the study period. Note that for practical purposes, the carbon cap-and-trade allowances would be built into the purchase prices of natural gas filed market resources. However, because it is an important variable on its own, the figures have separated it out.

The top-most pink segment is for the Power Charge Indifference Adjustment (PCIA), a fee paid to SDG&E to ensure that the operation of the CCA does not strand SDG&E's remaining bundled customers with costs associated with power purchased on behalf of customers who have shifted to the CCA.

The black line represents SDG&E's average generation rate. To forecast SDG&E's generation rates, the comparison model used information regarding SDG&E's utility-owned generation, power contracts, power market costs, and by closely tracking changes in SDG&E revenues and costs through its filings in several CPUC proceedings. In particular, it takes the most recent SDG&E filing of generation rates (for 2018) and applies the known and anticipated changes to the wholesale power market prices and SDG&E's power purchase contracts.

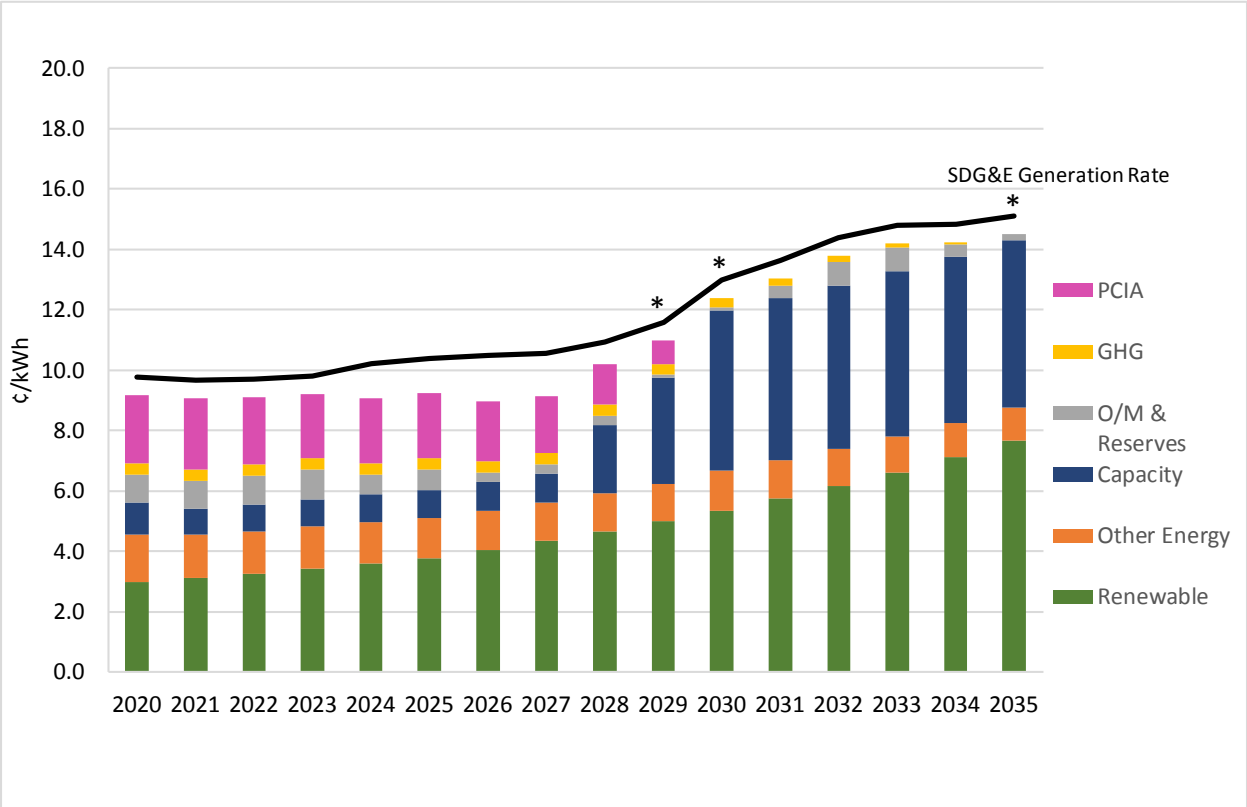
Figure 6. Average CCA Cost Projection (Base Case)



As noted on Figure 6, the CCA cost bars make no assumption concerning contributions to reserves or other programs. To show how the rate reserves can be managed, the Base Case was also run so that a 0.6¢/kWh (approximately a 5% reduction from the SDG&E generation rate) is maintained throughout the study period (see Figure 7). The contributions to, and withdrawal from, the reserves are included in the gray O&M component. Contributions to the reserve fund are set to equal the residual between the revenue generated by the CCA with the specified

0.6¢/kWh rate savings relative to SDG&E and the CCA's expenses. Contributions to the reserve continue until it reaches 15% of the annual revenue. If in a particular year the CCA's expenses (including the PCIA) exceed the rate target, the reserve fund is drawn upon so that the rate target is achieved. This is seen in 2029 and 2030 (marked with "*"), when without withdrawing from the reserves the target savings could not be achieved. Following those years, the gray bar increases so that the reserve can be replenished.

Figure 7. Average CCA Cost Projections, Including Reserves and a Minimum Rate Savings of 0.5c/kWh



C. Rate Comparison Sensitivities

The results shown in the base pro forma are for expected market conditions and outcomes. However, it is unlikely that the conditions assumed in the base case will occur exactly as assumed. In order to evaluate the robustness of the base case, the key variables must be identified, and pro forma analyses conducted with other assumptions for those key variables to "stress test" the assumptions. The four variables with the greatest potential impact on the overall average cost of the CCA were investigated: (1) higher or lower renewable supply costs, (2) higher or lower natural gas prices, (3) what would happen if the PCIA was 25% higher than forecast, and (4) higher opt-out resulting from SB 237, expansion of Direct Access program. The specific assumptions on the sensitivity scenarios are shown in Table 5 and the results summarized on Table 6.

Table 5. Sensitivity Case Definitions

SCENARIO	DEFINITION
Base Case	Business as usual
High Gas Price	Gas prices 70% higher than base case
Low Gas Price	Gas Prices 50% lower than base case
High Ren. Price	Renewable prices increase rapidly, 35% higher than base case by 2030
Low Ren. Price	Renewable prices remain flat, 10% lower than base case by 2030
High PCIA	25% higher than calculated in the base case or 1¢/kWh
High Opt-Out	50% of eligible non-residential customers opt-out of CCA service

Higher/Lower Natural Gas Prices Sensitivity. Natural gas prices have been low and relatively steady over the last few years, but they have historically been quite volatile and subject to significant swings from local supply disruptions (e.g., Hurricanes Katrina and Rita in 2005). Some of this volatility is illustrated in the historical section of Figure 4. The gas price sensitivity cases assume either a 70% increase over the base forecast of a 50% decrease. Natural gas price increases affect power supply costs for both CSDCCA and SDG&E, although because the CCA is assumed to receive an increasingly smaller portion of its power from non-renewable market resources, the impacts are greater on SDG&E. Thus, the changes from the base case scenario are due to higher (high gas) or lower (low gas) SDG&E rates rather than changes to the CCA. For the high case price case, the CCA can maintain a 1.0¢/kWh rate advantage over SDG&E, while with the low case price case, the average rate advantage decreases to 0.30¢/kWh.

Higher/Lower Renewable Power Prices Sensitivity. In the Higher Renewable Power Prices sensitivity, renewable prices are assumed to be flat in nominal dollars through 2022 if it were not for the tax credit expirations and add the impact of the tax credit expirations to the base case prices. Average renewable power prices in this scenario are about 20% higher in 2021 and 2022, and 35% higher after 2022. These higher prices affect both the CCA and SDG&E, but they have a greater effect on the CCA because SDG&E has significant amounts of renewable resources under long-term contract. The impact of this stress case is to reduce the 2020-2034 average rate advantage to less than zero (i.e., CCA rates higher than SDG&E's).

Lower renewable costs are beneficial to the CCA for the same reasons that the high renewable case is harmful. There, the 1.0¢/kWh average rate advantage over SD&GE's generation rate can be maintained.

High PCIA Case. The models used to create this report explicitly simulate the calculation of the PCIA. Therefore, underlying changes to the market—higher or lower natural gas or high or

lower renewable costs, explicitly ripple through to the PCIA. However, for the sake of interest and conservatism, a case where the PCIA is arbitrarily increased to the greater of 125% for the calculated PCIA or 1.0¢/kWh. Here, at best rate parity can be achieved.

High Opt-Out Case. The base case, and all other cases, account for the increase in Direct Access (DA) load provided for by Senate Bill 237 by decreasing the commercial and industrial loads served by the CCA. However, it is likely that the Direct Access interests will continue to push for greater expansion of the DA market, up to allowing all non-residential accounts to be eligible for DA service. To estimate the impact of a re-opening of DA, a case was run wherein the non-residential load served by the CCA was halved.

The calculated impact of this case was modest: the minimum rate advantage dropped from 0.7¢/kWh to 0.6¢/kWh. However, as discussed in greater detail in the Section VI.A, the reopening of Direct Access could occur a few years after the CCA has begun service. In this case, unless planned for, the CCA could find itself with power contracts delivering more power than is needed by the CCA and thus generating "stranded costs." This possibility must be explicitly planned for.

Likelihoods of Sensitivity Cases. While all the variables explored in the sensitives could occur, they are not equally likely, nor are any likely to persist throughout the 15-year study period. Table 6, below, shows the rate advantages possible for each scenario (as described above) along with MRW & Associates' qualitative professional opinion as to how likely they are to occur. First, with respect to gas prices (and hence market power prices), given that they generally at historic lows, having them decrease by another 50% and remain at that low level is unlikely. Events, such as storms in gas production areas or pipeline disruptions (such as is currently being experienced by Southern California Gas on a transmission pipeline near the Arizona boarder), could cause short-term price increases. Furthermore, increased environmental regulation of hydraulic fracturing (fracking) or increased markets for US natural gas could increase natural gas prices. As such, we find the high gas price case to be about as likely as the base case.

The high and low renewable prices are more uncertain. Prices offered for power sales contracts from new renewables have been falling remarkably over the past 10 years. However, this price trend cannot continue indefinitely, as the raw materials, labor, and administrative/regulatory costs will remain flat or increase, even if the cost of solar panels and wind turbines remain flat or decrease further. The driver behind the high renewable case is the removal of the various production and investment tax incentives without commensurate reduction in fundamental technology costs. While such a scenario could occur, we do not find it to be likely.

Table 6. Sensitivity Case Results Summary

SCENARIO	Consistent Savings Achievable	Likelihood
Base Case	0.7¢/kwh	Possible +
High Gas Price	1.0¢/kWh	Possible +
Low Gas Price	0.3¢/kwh	Not likely
High Renewable Price	-0.2¢/kWh	Not likely
Low Renewable Price	1.0¢/kWh	Possible -
High PCIA	0.0¢/kWh	Possible -
High Opt-Out	0.6¢/kwh	Possible

IV. Management Structures

In addition to selecting an operating structure, the City will decide between three primary governance options for the CCA:

1. where the City is the sole government agency responsible for the CCA's creation and operation,
2. participation with other agencies in a JPA, where multiple agencies share these responsibilities; or
3. a hybrid JPA, where the CSDCCA maintains rate and local program control, but shares some other common activities with other CCAs.

A. SD-Only Enterprise

In a sole jurisdiction approach, the City maintains full flexibility—and responsibility—for developing policies and procedures. This means that they can be tailored to and responsive to the City's stakeholders and constituents only and based upon their own objectives. The City would be responsible for setting policy priorities in general and making specific decisions about power generation, staffing policies, local economic development activities and strategies, formulation of financial and debt policies, and development of energy efficiency (EE), demand response, electric vehicle (EV), and distributed generation programs. Along with greater autonomy, the City would assume all risk, liability and costs associated with operating the CCA. In this case, the likely path would be for the City to establish the CCA as an enterprise fund, and work with appropriate legal counsel to explore options for controls and structural safeguards to insulate it and minimize risk to the City's general fund.

Within the City-Only option, the CSDCCA would determine if it is to be a fully in-house operation with existing or added City Staff, or if the City would outsource some of all the activities, with the City only administering contracts and managing vendors.

Examples of some of the categories of operating activities that would need to be performed in-house or outsourced:

- Power procurement, scheduling;
- Finance, budgeting, and accounting;
- Billing and customer service;
- Communications, outreach and public relations;
- Specific programs such as demand response, EE, EV or Distributed Generation (DG);
- Regulatory monitoring and compliance, CPUC filings, etc.

The likely best short-term option would be to outsource the highly technical functions, and maintain some of the management, planning and other public-facing functions like communication in-house. The range of options depends upon the degree of operating control the City wishes to maintain, the costs associated with maintaining those functions, and the degree of risk it is willing to accept on its own, or delegate to (and pay) third-party providers to assume

No matter the degree of outsourcing, the City would need to establish the CCA in as an enterprise fund. Enterprise funds are commonly used for public utilities such as electric, water and wastewater, or other city functions where a public service is operated and provided in a manner similar to a business enterprise, where fees and charges are collected for services provided, and accounting and budgeting are separate from a city's general fund. Setting the CCA up as an enterprise fund provides a structure where the revenues and expenditures are separated into separate funds, budgeted for on their own, and reported on their own financial statements. In an enterprise, financial transactions are reported like business activity accounting; revenues are recognized when earned and expenses are recognized when incurred. Establishing an enterprise fund provides management and CCA customers with more visibility and accountability, and the ability to more easily separate and measure performance, analyze the impact of management decisions, determine the cost of providing electric service, and use this information to develop cost-of-service electric rates. Enterprise accounting will allow the City to demonstrate to customers, the public and other stakeholders, that the cost of power is being recovered through its rates, and not being subsidized or comingled with other City funds or functions.

B. JPA with Others

The second option would be the formation of a JPA, where the JPA is an independent agency that operates on behalf of the public agencies which are party to its creation. In this approach, the City effectively shares responsibility with the other agencies participating in the JPA. The divisions of these responsibilities and the sharing of decision-making authority would be determined at the time the JPA is created. Other critical 'ground rules' would also need to be

negotiated and memorialized, such as financial and possibly staffing commitments of each participating agency, and the composition of the board and voting procedures.

Sections 6500 to 6536 of the California Government Code constitute the enabling legislation for Joint Powers Authorities, and the Public Utilities Code allows a CCA program to be carried out under a joint powers agreement between entities that each have the capacity to implement a CCA program individually. A JPA may be formed when it is to the advantage of two or more public entities with common powers to combine resources, or when local public entities wish to pool with other public entities to save costs and/or gain economies. It can also be employed to provide the JPA with powers and authority that participating entities might not have on their own. A JPA is a legal and separate public entity with the ability to enter contracts, issue debt, and provide public services, among other things, and like the City, it would have broad powers related to the operation and management of the CCA, and the study, promotion, development, and conduct of electricity-related projects and programs.

The JPA structure may reduce the risks of implementing a CCA program to the City by immunizing the financial assets of the City and the other participating agencies, and distributing the risks and costs associated with the CCA among the participating entities. It could also provide the benefits of scale and economy for certain aspects of CCA operation, such as power procurement or back office billing and accounting functions.

A CCA operated under a JPA could benefit from increased negotiating and buying power for power purchases, access to better financing terms for borrowing, and operating efficiencies gained by combining back-office functions such as billing and accounting. These benefits would accrue to customers through better pricing for power and debt, and ultimately more competitive electric rates. A larger JPA could also wield more political influence, which could be beneficial when participating in CPUC or other regional or state regulatory, legislative or policy making activities.

Key tradeoffs to the benefits of a JPA are that decision making is allocated amongst the parties and management independence is diminished. Objectives of participating agencies will likely differ, and reduced autonomy can manifest when setting priorities for local generation, economic development activities and importance of support programs. When the JPA is formed, a Board must be appointed to set policy and make decisions. The makeup of this board is subject to negotiation among the participating entities but would likely be made up of elected officials from each participating agency. The process of determining the makeup of the board, and each respective members' voting weight can be based on several factors, for instance percentage of customers or load or relative financial contribution, but in any case, decision making is certainly more complicated. The number of stakeholder interests and priorities are multiplied, and in many cases, reaching consensus on key decisions is more complex and time-consuming than if only one agency were involved.

A quantitative analysis of whether a JPA would benefit or reduce the financial prospects of the CCA, based upon the addition of specific agencies and their associated energy load, is beyond the scope of this report. Additional analysis would be necessary to determine if adding the load

of other agencies to the load served by the San Diego CCA would create different demand patterns and peaks, or compound existing peaks, either of which might adversely impact San Diego CCA customers, or the customers of the other prospective JPA members.

A standard JPA would be possible for the City, but it would require joining with at least one other jurisdiction. This could include one of the neighboring cities who has already formed a CCA or are also considering CCA, such as Solana Beach or Chula Vista, or even unincorporated San Diego County. If this option is to be pursued, discussions with potential partners would need to begin.

C. Hybrid JPA

The Hybrid JPA approach was established by the California Choice Energy Authority (CCEA). CCEA "was designed expressly to help cities in Southern California Edison territory to participate in community choice aggregation without having to sacrifice control often associated with JPAs or taking on the sufficient liability of a single entity CCA." CCEA started with the City of Lancaster, and currently works with CCAs in Pico Rivera, Hermosa Beach, San Jacinto and Rancho Mirage. CCEA can provide to their member city CCAs:

- Regulatory and legal affairs,
- Rate analysis,
- Financial projections,
- Project scheduling,
- Load forecasting,
- Electronic data exchange,
- Power procurement,
- Investor-Owned Utility (IOU) relations,
- Marketing assistance,
- Guidance to city council and management,
- Call center; and
- Banking and accounting functions.

The City's CCA would still maintain at minimum local governance, rate setting, community outreach and marketing.

There are two potential drawbacks to the hybrid JPA model for the City. First the only hybrid JPA, CCEA, is currently working only in Southern California Edison's (SCE) territory and would have to change its policies to include a San Diego CCA. Second, a CSDCCA would be comparatively very large whereas the hybrid JPA model is more designed to accommodate small CCAs—that is, allow them to take advantage of economies of scale by banding together with other small CCAs for common service needs. A CSDCCA would be significantly larger than all CCEA members, combined, with the interests and resources to conduct most of the CCEA's functions on its own, likely more efficiently than layering on another level of administration. If the City were to partner with other local communities, a full JPA would be the better path.

D. Discussion

The quantitative and pro forma analyses in this business plan assume the first option (a city-only CCA) only out of practicality and should not be seen as a recommendation. The City could quite reasonably team with other jurisdictions within SDG&E's service area to form a JPA. That path would require a longer start-up phase, as multiple political bodies would have to sign off on the JPA formation documents and basic policies. Furthermore, the total costs shown here are proportional to the CCA size; thus, joining with smaller cities would not appreciably lower the average cost relative to a city-only CCA.

IV. Operations

A. Supply Management

As shown in Section III, the vast majority of the CCAs costs are associated with the power supply. Therefore, sound supply management is critical to a CCA viability.

1. Approaches

The first fundamental decision that the CCA management or board would be how much, if any, of the supply management would be conducted by CCA staff, with the remainder outsourced to other entities. Some functions, such as schedule coordination (i.e., hour -to-hour management of the CCA's power in the CAISO market) would need to be handled by a qualified contractor. Other functions, such as the determination of desired resources, long-term resource planning, issuance of request for offers for power, can be handled either in-house or outsourced to qualified contractors.

CCAs in California have approached supply management in a variety of ways. For example, Solana Energy Alliance (Solana Beach), Redwood Coast Energy Authority (Humboldt County) and Desert Community Energy (Coachella Valley) outsource all of their supply management to The Energy Authority, a non-profit corporation set up to serve public power entities. Others use the California Choice Energy Authority (a "JPA-Light") to provide some level of direction to power procurement while still maintaining some control (and risk). Examples of these CCAs include Lancaster Choice Energy and PRIME Energy (Pico Rivera). Others, typically more experienced CCAs, conduct their own power planning, run their own procurement solicitations, and manage their supplier contracts. All, to date, outsource their schedule coordination services.

2. Integrated Resource Planning

An integrated resource plan (IRP) is a planning document that lays out a utility's (or CCA's) projected loads and identifies a least-cost plan to meet those loads. Under the direction of the CCA's procurement manager, the CSDCCA will establish an ongoing long-term (10 year) procurement plan to meet the CCA's goals while complying with all applicable state regulations.

Additionally, pursuant Senate Bill 350 the CPUC established a Rulemaking (R.16-02-007) which set the requirements for CCA (and other LSE) IRPs. The "IRP" coming out of this process differs from the conventional utility IRP planning document. It is designed so that the state overall has a clean pathway to meeting its aggressive climate and GHG-emission reduction goals. In the CPUC process, the CPUC first set overall GHG emissions targets. Those targets are

pro-rata assigned to all LSEs in the state, which then must submit plans, using specified computational tools, to meet or exceed the pro-rata GHG emissions. The first IRPS were submitted on August 1, 2018, with the first two-year update due in 2020.

3. Risk Management Policies

Once staffed, the Procurement Manager must develop a Supply and Risk Management Plan. This plan will address risks faced by the CCA arising from its procurement activities. The Procurement Manager will develop metrics that guide procurement decisions that include a rigorous analysis of net open position limits by month and a cost-at-risk which may include, but not limited to, total portfolio cost at risk, rate at risk, and cost per wholesale MWh at risk.

4. Product Content Policy

The power content of the CSDCCA would be dictated by the combination of the state's renewable portfolio standard requirements and the City's CAP goals.

5. Local Projects Prioritization

To the extent feasible, CSDCCA will meet its GHG goals through new, preferably local renewable generating capacity and demand-side efforts, including energy efficiency and conservation programs. The CSDCCA would evaluate opportunities for constructing or investing in new resources such as in-City solar photovoltaic (PV) cells, local renewable distributed generation such as fuel cells, and one or more regional wind turbine farms, as well as demand-side management, including conservation, peak shaving, and increased energy efficiency efforts. Before making any future decisions to construct or cause the construction of specific renewable energy projects subject to the California Environmental Quality Act (CEQA) the CCA would consider any environmental review documents prepared by the City or other lead agency in compliance with CEQA and adopt any required CEQA findings as part of such approval actions.

This goal requires CSDCCA management to define what is "local" and to set policies to balance the benefits of local generation, particularly distributed generation, against their increased costs. Initially, there will be three levels of "localness:"

Level 1: within the City limits of San Diego. Projects that are constructed within San Diego's City limits would be considered Level 1 local and receive the highest priority in procurement selection, subject to their financial impact on the CCA.

Level 2: within San Diego County but outside of the City. Projects that are constructed within San Diego County but outside of the City limits would be considered Level 2 local and receive the second highest priority in procurement selection, subject to their financial impact on the CCA.

Level 3: adjacent California counties. Projects that are constructed within Orange, Riverside and Imperial Counties would be considered Level 3 local resources and receive the third highest priority in procurement selection, subject to their financial impact on the CCA.

The degree to which Level 1, 2 or 3 projects are prioritized in procurement will be determined by the CSDCCA board.

With respect to the Level 1 resources, as part of a grant from the National Renewable Energy Laboratory, the Clean Coalition is conducting a solar siting potential survey, which will identify areas for installing solar 1 MW or more city-wide. This study also will include a "gap analysis," to identify costs under scenarios of 100% bulk renewable procurement versus mix of maximum local DG and bulk procurement.

Projects outside of the local area, including within Mexico, would be used as necessary to meet the fundamental goals of financial stability and the CAP.

6. Rate Setting

CCAs have, by statute, flexibility in how they set rates. CCAs typically set rates as a prescribed amount below their incumbent IOU's rates, be that a percent discount or a fixed cent per kilowatt-hour discount. The discounts are set so that the CCA collects enough revenue to cover its costs. The "discount-off-of" rate-setting provides for easy comparisons between incumbent utility and CCA rates but is by no means the only option. For example, Monterey Bay Community Power (MBCP) operates on more of a "cooperative" framework. Rather than offering a monthly discount, customers taking service from MBCP receive a 3% rebate every year (for residential customers), twice a year (for small/medium sized customers), or four times a year (for large customers). MBCP customers also have the option of redirecting their rebates towards the development of local renewable energy projects. MBCP customers can also donate their rebate to fund local non-profits whose mission is to lower GHG emissions or support low income ratepayers.

A CSDCCA would set rates to fully recover the costs of operations, debt service, and to fund reserve accounts. These rates will "provide sufficient resources for the continued financial health" of the enterprise and be based on cost of service. How exactly the rates would be set would be determined by its board.

CSDCCA's rate setting process would be open and transparent to the public. No later than November 15 of each year, the CSDCCA's staff will present to its board the CCA's projected rates for the following year, along with SDG&E's most recent rate projection (generally via the November Update to its Energy Resource Recovery Account Application).[13] In setting rates, the CSDCCA would consider its projected cost of operations for the upcoming year, debt service, reserve account status, and SDG&E's projected rates, including the PCIA or its successor. The CCA would set rates for its base product at or below the SDG&E's rates, unless reserves or other extraordinary factors dictate that exceeding the SDG&E rate would be needed.

The proposed rates would be presented to the board and public in December of the year prior their implementation. The board would review the proposed rates and take public comment. Once SDG&E issues its Advice Letter setting its rates for the following year, generally the last week of December in prior year.

[13] SDG&E files an application to the CPUC that forecasts its generation costs for the following year. Its final generation rates are presented in the update to this filing, made in early November of each year.

The new rates would be implemented one month following the implementation of SDG&E's Annual Electric Rate Advice Letter, which typically takes effect January 1 or each year.

When CSDCCA's new annual rates are set, it will publish on its website updated comparisons between the CCA's rates and SDG&E's. For illustrative purposes, the comparison of MCE and PG&E's residential (Schedule E-1) rates are shown in Table 7 below. The table provides comparisons of both PG&E and MEC's standard product as well as their 100% green options.

Table 7. Sample Rate Comparison

E-1 *

Residential: E-1	PG&E	PGE Solarchoice (100% Renewable)	MCE Light Green (50% Renewable)	MCE Deep Green (100% Renewable)
Generation Rate ($/kWh)	$0.09838	$0.09529	$0.06800	$0.07800
PG&E Delivery Rate ($/kWh)	$0.14049	$0.14049	$0.14049	$0.14049
PG&E PCIA/FF ($/kWh)	N/A	$0.02919	$0.02977	$0.02977
Total Electricity Cost ($/kWh)	$0.23887	$0.26497	$0.23826	$0.24826
Average Monthly Bill ($)	**$107.69**	**$119.50**	**$107.41**	**$111.92**

Monthly usage: 451 kWh
Rates are current as of June 1, 2017

In addition to meeting the requirements and goals of the existing rate policies, CSDCCA will also establish additional rate setting policies that are consistent with the needs of CSDCCA and its customers. These are:

- **Minimize rate volatility.** CSDCCA will endeavor to review rates once per year in the Spring and make adjustments if needed.
- **Allow flexibility for modest intra-year rate adjustments if necessary.** While the goal of CSDCCA is to have rate adjustments no more than once per year, it may be necessary to make additional intra-year adjustments. Such adjustments might be needed in order to ensure cost recovery and to remain compliant with the two overarching rate setting requirements established by the Charter. If such intra-year adjustments are needed, CSDCCA would limit such changes to no more than a +/- 2% change in the bill of the average customer.

Based on these policies, customers will have cost-based rates that are not highly volatile and still fully cover the costs of operation of CSDCCA.

B. Back-Office

The City will need to determine which aspects of the CCA will be operated and managed by City staff and which aspects are candidates for outsourcing to other entities. The City could break up the various services required to operate the CCA and select vendors for certain specialized functions where specific expertise or experience is necessary, for instance power procurement and/or CAISO scheduling.

There are multiple third-party ESPs that can provide energy procurement services as well as the required Schedule Coordinator interface to the CAISO. In addition, SDG&E provides services

for any CCAs within their service territory including billing and offers additional support services which can be used by CCAs for a fee. Utilization of these types of contracted services has been explored during the feasibility analysis and are assumed as the basis for many aspects of the City's possible future CCA operation.

It is worth noting that while outsourcing services to an ESP may reduce initial startup and operational costs, the cost over time will likely be greater. This option involves less direct control, where an ESP could provide most of the key functions of the program, including power procurement and rate development, and even scheduling, billing, and customer service. The CCA's role would be providing higher level administrative and management functions serving as the connection between the vendor(s) and the customers. It may be possible under this model for the CCA to negotiate terms with its vendor(s) to transfer much of the risk to them, subject to the vendor's willingness to accept them. There is a cost tradeoff for this transfer of risk. An ESP may be willing to guarantee certain service components, such as savings, rate certainty, renewable content, etc., but will likely require a greater premium for doing so. Another tradeoff for transferring this risk, is transferring the potential rewards, such as financial savings or returns should the CSDCCA successfully negotiate advantageous power purchase terms. A thorough and detailed procurement and negotiating process can provide the CSDCCA with much more detail about which components of CSDCCA operation can be cost-effectively outsourced, provide an indication of the terms that vendors may be willing to provide or negotiate, and generally provide more specific information upon which to base this decision.

1. Data Management

Data management entails daily electronic communication with SDG&E: SDG&E sending the CCA data on customer use, bills paid, unusual account activity, etc.; calculating the CCA portion of each customers' bill based on the usage data provided by SDG&E; and communicating that bill amount to SDG&E for it to put on the customer's bill and collect.

The CSDCCA or its JPA will outsource its data management services.

2. Communications /Call Center

Consistent with all currently operating CCAs in California, initially the CSDCCA would likely initially outsource its call center. CPUC required and general communications would be coordinated through the City's Sustainability Department and Communications Department, which would coordinate CCA communications and outsource appropriate activities (e.g., brochure production, banners, advertising, etc.)

3. Legal

Assuming it organizes as a City Enterprise, CSDCCA will utilize the San Diego Office of the City Attorney (City Attorney) as legal counsel to advise regarding administration of CSDCCA; review contracts; represent the program as necessary before the CPUC, other regulatory agencies, and the courts; and to provide overall legal support to the activities of CSDCCA. If CSDCCA is a part of a JPA, then separate counsel would be retained, either as a JPA employee or from a qualified outside law firm.

4. Regulatory

Activities at the major regulatory bodies as well as the legislature can impact virtually all aspects of CSDCCA's or its JPA's operations. An overview of state-level agencies currently impacting CCA development and operation is below.

California Public Utilities Commission (CPUC). While the CPUC does not regulate CCA's rates, they do enforce various operational requirements placed on them by the legislature. These include the Integrated Resources Planning, Distributed Resources Planning, Renewable Portfolio Standard, Energy Storage mandates, Resource Adequacy (RA) requirements and public goods charge energy efficiency funding. CSDCCA regulatory staff must be knowledgeable concerning the requirements of these programs and the reporting protocols to remain in compliance.

In addition, there are numerous proceedings at the CPUC that can directly or indirectly effect CSDCCA, such as SDG&E rate setting proceedings or Commission Rulemaking proceedings that address the exit fees CCA customers must pay. CSDCCA regulatory staff will collaborate with other local governments and CCA programs or other strategic partners to leverage resources and influence CPUC policy and proceeding outcomes. The staff will also proactively engage with the CPUC Commissioners and Energy Division staff to inform them of CCA program benefits and challenges.

California Independent System Operator (CAISO): The CAISO operates the power grid throughout most of the state, including in San Diego. CSDCCA must remain in compliance with all market rules and requirements as it schedules power to be delivered to the city.

California Air Resources Board (CARB): The CARB manages GHG reporting and operates the state's Cap and Trade Program. Thus, the CSDCCA must comply with all GHG requirements as directed by the CARB.

California Energy Commission (CEC): The CEC has must approve any thermal power plant over 50 MW, as well as collecting various data (e.g., sales, distributed PV) from all the load-serving entities for forecasting and setting state energy policy.

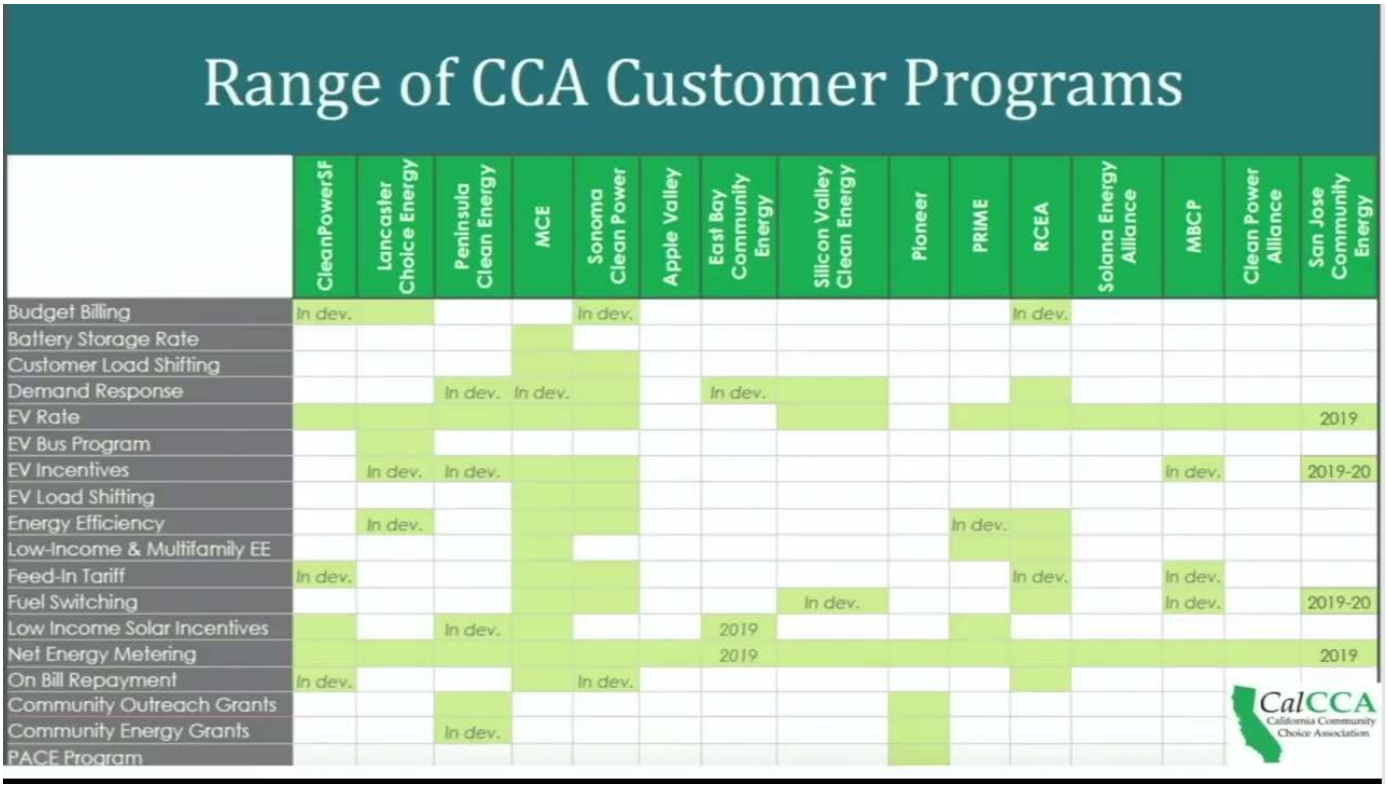
To the extent practical and necessary, CSDCCA will work with CCA trade organizations such as CalCCA to coordinate regulatory and legislative advocacy, such as participation on CPUC proceedings and lobbying and communications with state legislators. Nonetheless, there may be times that CSDCCA will need to have its own voice and directly participate in CPUC proceedings or communicate with legislators.

CSDCCA's or its JPA's compliance with regulatory requirements will be coordinated with the department or outsourced vendor providing the service being regulated. For example, resource adequacy and RPS compliance is tied closely to power procurement. Thus, the CSDCCA staff overseeing procurement will coordinate with the vendors to ensure compliance with the applicable statutes and regulatory reporting requirements.

V. Other Program Opportunities

For many CCAs, the opportunity to offer programs that are tailored to their specific communities is driving their formation. The table below illustrates many of the programs being developed and implemented by CCAs throughout the State. After establishment, the CSDCCA can consider leveraging the other CCAs' experience in one or more of these programs or develop its own.

Table 8. Sample California CCA Program Offerings



Budget Billing - sometimes also known as Balanced Payment Plans, when customers choose to enroll in Budget Billing, their previous 12 months of usage is averaged to determine a monthly payment amount. This enables customers to avoid large spikes in their electricity bills, especially if their usage changes between seasons. Depending on the CCA, customers' monthly payment amount may be adjusted to reflect any significant changes in their actual energy usage.

Customer Load Shifting - These programs involve shifting customer load from periods of high demand (typically in the evening), to periods when renewable prices are lower and market prices are higher.

Demand Response (DR) - Demand response is an umbrella term for a variety of methods to reduce overall demand on the electrical grid. Typically offered to nonresidential customers (though specific residential only DR programs exist), these programs involve customers curtailing their usage with varying lengths of lead time, ranging from just a few hours' notice to

one day ahead. Financial incentives in place that severely penalize customers who do not curtail their usage during the high peak periods.

Electric Vehicle (EV) Rate - Electric vehicle rates are specific to charging electric vehicles. Most EV rates are structured like standard time-of-use tariffs and charge different prices, depending on the time of day. In addition, depending on the CCA, these EV rates may not be tiered, meaning that the price per kWh of electricity is only dependent on the time of day and not at all based on total consumption of electricity.

EV Incentives - Several CCAs, as well as the state of California, offer incentives for new EV customers. The California Air Resource Board offers a $500 clean fuel rebate for new electric vehicle owners, while the California Clean Vehicle Rebate Program offers new EV owners up to $2,500 in rebates. Some CCAs, like Sonoma Clean Power, offer free EV charging equipment.

EV Load Shifting - EV rates are structured to incentivize customers to charge their EVs at night, when demand on the electric grid is low and the price of electricity is low. EV rates typically have the lowest price per kWh of electricity during normal "bedtime" hours.

Energy Efficiency (EE) - Energy Efficiency is a blanket term that encompasses a variety of programs CCAs may employ to reduce their customers' electricity consumption. Energy saving water heaters, efficient heating/air conditioning (HVAC) systems, and smart thermostats are just a few of the types of energy efficient upgrades customers can make.

Low-Income and Multi-Family Energy Efficiency - These energy efficiency programs are geared specifically for low-income and multifamily dwellings. MCE, for example, provides technical assistance, rebates, a free direct install service for light touch efficiency measures, and access to other resource conservation programs. But rather than providing an exhaustive list of specific programs, MCE works with properties to assess their unique needs in efforts of presenting them with the best energy saving measures.

Feed-In Tariff (FIT) – Feed-in Tariffs enable customers to sell back to the CCA electricity generated by their own distributed energy resource. The customer enters into an agreement with the CCA at a guaranteed price for a set period of time.

Fuel Switching - These programs involve switching customers to more efficient and safe fuel types (e.g. switching customers from gas to electric heating pumps).

Low Income Solar Incentives - Low Income Solar Incentives enable low income customers to benefit from rooftop solar systems. For example, MCE partners with GRID Alternatives to provide no-cost rooftop solar systems to low-income families. Application processes vary by CCA.

Net Energy Metering (NEM) - Net Energy Metering allows customers to credit excess electricity generated from their renewable energy system (e.g. rooftop solar). The maximum capacity of these systems varies by CCA. Customers have a special meter installed on their premises that tracks the difference between electricity consumed and electricity generated and bills the customer for the "net" amount.

On Bill Repayment/Financing - On Bill Repayment programs allow customers to take out loans to cover the upfront costs of energy efficiency improvements to their properties. The loan is then repaid through monthly installments as part of their electricity bill.

Community Outreach Grants - These grants provide funding for local organizations to communicate the benefits of their local CCA. Grant awardees develop outreach materials for their local communities.

Community Energy Grants - Community Energy Grants provide funds for organizations and individuals interested in energy development, innovation, greenhouse gas reduction or energy programs benefiting the local community. Depending on the CCA, grants may be as high as $75,000 for innovative energy projects.

Property Assessed Clean Energy (PACE) Program - Pioneer Community Energy's Property Assessed Clean Energy Loss Reserve Program, operated by mPower, provides fixed-rate, no money down financing to residential, commercial, industrial, agricultural, multifamily and non-profit property owners for energy efficiency upgrades, water conservation measures, and energy generation systems. There are currently 9 PACE providers administering programs in the City of San Diego.

VI. Risks and Risk Management

A. Opt-Out / Participation

Changes to Customer Base: Customers may choose to opt-out of CSDCCA service when their Phase is implemented, or in fact at any time. (Reduced CCA participation due to high rates is addressed in Section B, below). The opt-out risk comes at two distinct time periods. The first is the initial roll-out of the CCA program. While the most recent CCA launches have experienced only very modest opt-outs: around two to three percent of the eligible customers choosing not to take service form their CCA. If there are negative communications to San Diego citizens and businesses during the initial roll out (e.g., bad press), then the opt-out rate could increase. Second, customers could choose to leave CCA service after the initial opt-out period. The most likely driver of this opt-out risk is expanding Direct Access eligibility. As noted earlier, about 20% of the load in SDG&E's territory is served through Direct Access, with an additional 3% likely to occur prior to, or coincident with, the CSDCCA launch due to the limited expansion of the DA cap from SB 327. Additional expansions are possible, if not likely.

Mitigation: The experience of the prior CCAs suggests that opt-outs at the beginning of service tend to be in a relatively narrow range, allowing for some predictability in initial opt-outs. In addition, prudent power procurement strategies will allow for a reasonable uncertainty in load, especially that associated with DA expansion, without having to either dump power at a loss or purchase excessive amounts at high spot market prices. CCAs also can charge an "exit fee" akin to the PCIA to customers who have left CCA service after power contracts have been signed to serve their load, but to date none have been imposed.

B. Rate Competitiveness and Affordability

A primary goal is to offer power to San Diego residents and businesses are a competitive price relative to SDG&E. In this circumstance, competitiveness is tied to the rate offered by SDG&E. A number of factors can cause CSDCCA's net power costs exceed SDG&E. CSDCCA will have in place risk management plans and options to both mitigate these risks by lowering rates passed on to customers back down to a competitive rate as well as to address unexpected risk.

Changes to SDG&E Generation Rates: There could be circumstances that result in SDG&E's generation rates to be less than CSDCCAs. Assuming that SDG&E's rates are based on its cost of service, CSDCCA obviously has little or no ability to influence the rates that SDG&E offers.

Mitigation: While CSDCCA has little ability to affect SDG&E's generation rates, it will take proactive steps to mitigate the impact of reductions in SDG&E's generation rate. These steps are discussed below.

Changes to SDG&E's PCIA Rate: Assembly Bill 117, which established the Community Choice Aggregation program in California, included a provision that states that the customers that remain with the utility should be "indifferent" to the departure of customers from utility service to CCA service. This has been broadly interpreted by the CPUC to mean that the departure of customers to CCA service cannot cause the rates of the remaining utility "bundled" customers to go up. To maintain bundled customer rates, the CPUC has instituted an exit fee, known as the "Power Charge Indifference Amount" or "PCIA" that is charged to all CCA customers. The PCIA is intended to ensure that generation costs incurred by SDG&E before a customer transitions to CCA service are not shifted to remaining SDG&E bundled service customers.

Thus, for a CSDCCA customer to realize an economic benefit (i.e., pay the same or less for electricity), the sum of the CSDCCA charges plus the PCIA must be lower than SDG&E's generation rate.

Mitigation: The PCIA is established at the CPUC. To ensure that this charge is properly calculated and that it is correctly allocated to CSDCCA customers, it will be necessary for CSDCCA to monitor and actively participate in the regulatory proceedings in which the CPUC sets the PCIA.

CSDCCA Costs. CSDCCA will incur costs to purchase power and operate. These costs can increase so that they exceed the level at which CSDCCA can be competitive with SDG&E.

Mitigation: First, CSDCCA will manage its supply portfolio in a manner that it is not exposed to unmanageable down-side risks. In general, this will consist of fixed price contracts with creditworthy counterparties. Second, if in a particular year, a short-term event results in CSDCCA's average costs exceeding SDG&E's generation rates less the PCIA, CSDCCA will endeavor to reduce rates (to the extent feasible and prudent given existing reserves) such that CSDCCA's prices will remain competitive with SDG&E.

Managing a portfolio of power supply is an exercise in forecasting dynamic and often unpredictable consumer demand under various scenarios and identifying the types of energy

supply contracts that meet the load requirements in the most cost-effective and reliable manner. In the case of the power supply portfolios explored in this study, renewable energy provides between half and all of the energy supply. While geothermal generation has predictable output like fossil fuel generation, solar and wind generation is intermittent. The forecast accuracy for wind and solar generation is improving[14], but customer-side and supply-side renewable generation output variation results in both the extremely high and low CAISO prices. LSEs (including CCAs) with high adoption rates for customer owned solar as well as significant variable renewable supplies increase exposure to such CAISO price spikes:

- An overabundance or over-generation condition from renewable resources can force CAISO market prices negative, potentially creating a loss for the CCA when compared to the premium price paid for that renewable supply.
- Under production or scarcity conditions resulting from failure of intermittent resources to produce can force CAISO market prices to spike at a time when the CCA may potentially be required to buy power to make up for renewable energy shortfalls.

Customer adoption of DG PV also increases variability within the load forecast. Developing an actual load forecast and the associated procurement and resource management responsibility for a CCA becomes more difficult and less predictable as the amount of DG increases. Over-procuring or under-procuring resources are both risks that can result for the CCA; as well as other power procurement risks.

Several strategies can assist in mitigating such risk. First, maintaining up to date forecasting technology, understanding market dynamics and market rules, and having codified power procurement processes and procedures are all important means to managing power procurement risk. Having a robust power supply plan, diversifying supply portfolios by production type, generation size and location, contract length, timing of contract purchases, and the use of hedging instruments are also useful risk mitigation practices. Perhaps most importantly, however, is working with an experienced, reliable team of professionals who understand power risk management, power supply planning and procurement, scheduling and coordination, demand forecasting, and regulatory issues. This team will be necessary to help the CCA form a robust and responsive risk management plan and institute appropriate risk evaluation techniques and mitigation mechanisms/programs, as necessary.

C. GHG Goals

A second goal of CSDCCA is to provide cleaner power alternatives to San Diego residents and businesses. This means purchasing greater quantities of renewable power than is required by law. The primary risk to meeting this goal is a lack of renewable power at prices that won't jeopardize the cost competitiveness goal. This could occur if a greater-than-expected number of customers

choose the 100% green option, or if a renewable supplier is not able to deliver the power according to its contract.

Furthermore, genuine GHG reduction cannot occur if the CSDCCA simply relies upon renewable generators that are in place at the time the CCA is formed. While using existing generators is necessary during the first years, real GHG reduction requires the CCA to contract with new renewable generators. The City has already issued Request for information and request for qualifications for new renewables, which received a robust response from numerous developers.[15] This indicates the goal of developing new, incremental renewable resources to serve the City is feasible.

In addition, because of California's aggressive climate policies, such as the recently passed Senate Bill 100, the incremental benefit of using a CCA to meet its renewable energy goals is diminished. While under current policy, the CCA would accelerate the achievement of GHG-free power by 10 years (from 2045 to 2035), the legislature could continue to ratchet down California's GHG emissions targets so that the net GHG impact of the CCA is *de minimis*.

Mitigation: The GHG-free procurement risks can be minimized by contracting with only experienced, creditworthy, reputable developers of renewable energy, and by prudent portfolio management. The CCA must also work to develop new renewable resources so at to generate genuine GHG reduction rather than simply using already-generating renewable resources.

D. Local Impacts

A third goal is for CSDCCA to expand its renewable portfolio, to the extent feasible, through new, preferably local renewable generating capacity and demand-side efforts. There are a number of hurdles to meeting this goal. Furthermore, local project will tend to be more costly than remote ones, and even then, requires a workforce with particular skills.

Mitigation: First, even without central-station solar, there is a large potential for behind-the-meter local distributed solar within this city that can be leveraged. The results of City's current work with the Clean Coalition and the National Renewable Energy Laboratory (NREL) to conduct a survey of potential sites throughout the city where solar is viable. The study will not only viable solar siting opportunities across the urban and suburban environments, but also evaluate those opportunities based on the interconnection potential of the local grid for each identified site. This will provide valuable data on the potential of local solar resources and can provide a backbone on local resource planning.

Second, CSDCCA can work with other entities such as municipalities, to identify locations that could hold megawatt-scale solar arrays. Third, CSDCCA can partner with local job-creation agencies to ensure that there are local workers with the requisite skills to install and maintain the renewable and energy efficiency infrastructure that will be created.

E. CCA Financial Stability / City Financial Exposure

How the newly formed CCA will cover the upfront fixed and variable operating costs is a complex issue that must be carefully overseen by an experienced individual or firm, preferably one that has worked with other newly formed CCAs in California and elsewhere. For some of the CCA costs, the amount of initial funding required will depend on expenses that are somewhat easier to quantify, such as:

- Initial real estate, facilities, and office equipment costs;
- Staff salaries and benefits from onset ramping up to full operation;
- Regulatory filings, environmental, and compliance services; and
- Consulting and contractor costs.

These costs are laid out in Section III.A.2 Administrative and General Costs.

However, a large portion of potential costs will be more difficult to quantify and to assess in terms of risk, as they relate directly to the pace and magnitude of customers opting out of the CCA at its onset and over time.

- How much power will the CCA need to procure and how will it change over time?
- What will be the desired level of renewable energy versus conventional generation resources ultimately demanded by customers and how much are the differences in cost?
- What portion of power will be purchased on the market or through long-term power purchase agreements?
- How will market power purchases be transacted and by whom?
- What will be the costs and terms of long-term power purchase agreements?

The answers to these and other questions will have significant impact on the appropriate financing strategies and resulting liquidity requirements for the CCA, both up front and on an ongoing basis.

1. Sources of Financing

The CCA will need to evaluate the financing options available and the relative costs and benefits of each in consideration of the CCA's risk tolerance. Financing options include:

Direct Loan from City (startup): The City could loan funds from the General Fund all or a portion of the stat up needs. The City would be secured by the CCA revenues once launched. The City would likely assess a risk-appropriate rate for such a loan which is likely higher than the City earns for funds otherwise invested. This rate is estimated to be 4.0 percent to 6.0 percent per annum.

Collateral Arrangement from City (startup and ongoing): As an alternative to a direct loan from the City, the City could establish an escrow account to backstop a lender's exposure to the

CCA. The City would agree to deposit funds in an interest-bearing escrow account which the lender could tap should the CCA revenues be insufficient to pay the lender directly.

Loan from a Financial Institution with Support (startup and ongoing): Another alternative to a direct loan from the City would be for the City to backstop a lender's exposure to the CCA via a letter of credit, loan guarantee, or other promissory. The financial institution would not call upon the City unless the CCA was unable to make payment.

Loan from a Financial Institution without Support (startup and ongoing): At least one CCA, Silicon Valley Clean Energy Authority (SVCEA), was able to use this option to fund ongoing working capital. After members funded a total of $2.7 million in start-up funds, SVCEA has obtained a $20 million line of credit without collateral.

Vendor Funding (ongoing): The City can pursue arrangements with its power suppliers to eliminate or reduce the need for or size of funding for the start-up and operations. This could come in many forms such as a "lockbox" approach with a power provider. That is, the revenues that SDG&E would collect on the CCA's behalf would first go into a secured "lockbox" account, from which the power suppliers would be directly paid. After the power providers are made whole, the remaining revenue would then flow the CCA.

Long-term bonds: Bond issuances may secure an adequate (large) pool of cash that could sustain the CCA for a significant period of time and provide a cushion for swings in demand and power prices. However, as a new entity, the CCA itself with no credit or business history would not likely about to issue debt. The City, using its own credit rating could in theory issue the bonds, but doing so would place the city's own credit rating at risk. Furthermore, risk with bond issuance is it may result in the CCA incurring an unnecessarily high level of debt or a shortage of funds depending on the accuracy of the sales and power cost forecast. Bond issuances can also be expensive and the CCA could incur significant issuance/underwriting costs.

Short-term commercial paper (ongoing): Short-term commercial paper (less than nine months maturity typically) is usually not backed by any form of collateral and as such it is a form of unsecured debt—however only large entities with high-quality debt ratings will find issuers without having a much higher cost for the debt issue. The CCA is a new entity and does not have an established credit history or recognized debt rating and as such access to this instrument would be difficult without the backing of the City's General Fund.

Letters of credit (ongoing): These typically would be letters of credit required by the power producers/marketers, with the required level of extreme specificity and additional complexity and rigidity associated with these instruments. Typically, a letter of credit is issued by the entity's existing Banker; as a new entity the CCA would need to explore this option with their potential Banker(s), and/or have the letter backed by the City's General Fund.

2. Other CCA's Initial of Financing

The City of San Jose's CCA's (SJCE) is similar in size to a CSDCCA. SJCE's initial capital requirement will be provided from the City budget and via conventional financing methods (e.g., bank loans or lines of credit). Subsumed in the initial capital requirement is SJCE's initial start-

up funding (up to $7.5 million), plus capitalized interest and fees on startup funding, which will be provided by the City of San Jose through the issuance of Commercial Paper and will be repaid by from the working capital financing. For the working capital financing, SJCE will make repayments (including any interest, as applicable) over an assumed 5-year term. SJCE will recover the principal and interest costs associated with the initial funding via retail generation rates charged by SJCE to its customers. It is anticipated that the initial working capital financing will be fully recovered through such customer generation rates within the first several years of operations.

Table 9. Financial Used By Other CCAs

Forms of Support		
CCA Name	**Pre-Launch Funding Requirement[1]**	**Funding Sources**
Marin Clean Energy	$2- $5 million	Startup loan from the County of Marin, individual investors, and local community bank loan.
Sonoma Clean Power	$4 - $6 million	Loan from Sonoma County Water Authority as well as loans from a local community bank secured by a Sonoma County General Fund guarantee.
CleanPowerSF	~$5 million	Appropriations from the Hetch Hetchy reserve (SFPUC).
Lancaster Choice Energy	~$2 million	Loan from the City of Lancaster General Fund.
Peninsula Clean Energy	$10 - $12 million	PCE has also obtained a $12 million loan with Barclay and almost $9 million with the County of San Mateo for start-up costs and collateral.
Silicon Valley Clean Energy[2]	$2.7 million	Loans from County of Santa Clara and City members $21 million Line of Credit with $2 million guarantee, otherwise no collateral,

VII. Financial Structure and Costs

CSDCCA will be financially-independent Enterprise with no funds or debts comingling with the City General Fund. It will establish reserve funds commensurate with the working capital, operating reserves, and contingency requirements of the enterprise. To do so, CSDCCA shall develop a rate design that recovers sufficient revenue to adequately fund these reserves in the intermediate term. As a part of the City, CSDCCA will be able to utilize the expertise and systems of the City to reduce overhead costs. Another way that CSDCCA will control costs is to use contractors and/or City staff as appropriate.

A. Relation to the City

Based upon the policies and structures described above, CSDCCA plans to execute its plan in the timeframe specified while adhering to the necessary requirements, conditions, and protocols. The following sections describe the governance policy and the recommended performance and reporting metrics.

1. Governance Policies

Were the City to pursue an Enterprise CCA, its operations will follow from the broad policy directions established by the Mayor and City Council. Under a JPA, this policy direction and contract would come from the JPA board, which would include City representation. There will be significant levels of controls outside of CSDCCA, including external audits as well as review of performance to ensure that CSDCCA meets City-wide procedures and reporting requirements for an operation of this magnitude.

Table 10. Governance Structure for a CSDCCA

Function	Responsible Entity	Role
Overall Guidance	If Enterprise: ● Mayor ● City Council / Rate-setting board If JPA: ● JPA Board of Directors	● Broad oversight ● Policy Adoption ● Contract Approval
Strategic Direction	● CCA Management	● Policy Recommendations ● Prioritization of Efforts
Execution of Strategic Direction and Plan	● CCA Director and Staff	● Policy Analysis and Development ● Implementation of Plans ● Reporting and Metric Evaluation ● Rate setting
Controls	• CCA Management	● Adhere to Power, Business Services, and City-wide Procedures and Reporting Requirements ● External Audits

2. Performance Reporting Policy and Metrics

In order to ensure compliance with management's strategic direction for CSDCCA as well as City policy, CSDCCA will need to have clear, objective performance metrics and reporting requirements. The following table summarizes CSDCCA's recommended performance metrics.

Table 11. Recommended Performance Reporting Policy and Metrics

Performance Area	Metric
Customer metrics	• Number and type of customer served
Renewable Energy Content	• % of supply from renewable energy by resource type • Location of projects supplying energy
Local Energy Production and Savings	• Amount of energy produced (and saved) locally (MWh) • Amount of capacity and energy supplied behind-the-meter (MW and MWh)
Environmental Benefits	• GHG content of energy supplied (lbs/MWh) • Citywide GHGs reduced (lbs CO2e)
Economic and Social Benefits	• Direct and indirect jobs created (# of job-years) • Jobs numbers and types directly created by CCA Program • Customer bill savings (incl. energy efficiency and net metering) ($ and % saved)
Financial Metrics	• Progress towards reserves balance targets • Debt coverage ratio

The reporting metrics presented above are high-level reporting requirements. Individual elements within CSDCCA will also have reporting requirements, which will be recommended by CSDCCA management and approved by upper management. Examples include unhedged supply, value at risk, average supply costs by resource type and function (e.g., baseload, peaking, Resource Adequacy), retail prices relative to comparable SDG&E tariffs, and development status of different projects.

B. Reserves policies

CSDCCA has a policy related to establishing reserves to support its operations. There are two main reserves:

- Establish an Operating Reserve target level equal to 90 days of operating expenditures and
- Establish a Contingency/Rate Stabilization Reserve target level equal to 15% annual revenues.

There are two main reasons for establishing and funding these reserve accounts. First, having sufficient reserves ensures the long-term financial stability of the program by providing sufficient funds for ongoing operating cash needs, mitigating short-term, unexpected changes in revenues and expenditures, stabilizing rates, and funding future program growth. Second, having a prudent reserve policy is critical to securing favorable commercial terms with counterparties in power purchase agreements and lenders.

While funding the reserves will increase rates to consumers in the near-term, these reserves will ultimately lower costs to consumers because it will allow CSDCCA to obtain a strong credit rating, thereby reducing the costs for its line of credit and longer-term borrowing.

It is important to note that CSDCCA's requirements for financial reserves and credit facilities will increase as the program expands. The following table presents estimates for these requirements for Phase 1 and for full build-out.

Table 12. Expected Financing Requirements

Financial Need	Target	Phase 1 [16]	Full Program
Startup Costs[17]	Sufficient for Initial Operation	$4 million	N/A
Operating Reserve/Working Capital Needs	90 days' expenses	$30 million (assumes ¼ load in first phase)	$100 million
Rate Stabilization Reserves	15% of annual revenues	TBD	$60 million to be built up from rate revenues
Credit/Collateral to Support Supply Commitments	Sufficient to support fixed-price supply commitments for 3-5 years	TBD	TBD

As seen from this table, the financial requirements for a full-scale program are 4 times greater than the hypothetical Phase 1 requirements. Thus, the rate element that funds the establishment of these reserves will continue for several years after full program build-out, especially if the program grows quickly.

C. Financial Risk Mitigation Strategies

An important aspect of implementing an overall energy risk management program is the development of related strategies to mitigate all of the related risks associated with Energy product trading activities. key strategies are outlined below.

Portfolio management: The CSDCCA would strive to maintain an integrated and balanced portfolio of resources to cover its power delivery obligations, maintain the value of its assets, and manage resources within the CCA's financial requirements and within a dual volume and cost-at-risk framework, integral to the risk management strategy. The "cost at risk" will be designed

[16] Note that the phasing shown here is hypothetic and differs from the assumption in the pro forma analysis.

to capture all of the volume mismatches, basis risk, shape risk, and other balancing risks associated with a given wholesale electricity contract.

Minimum Coverage Requirements: The CSDCCA would manage price and volatility risk by implementing a diversified procurement strategy that involves purchasing energy products to hedge costs for serving load. The CSDCCA would purchase energy based on defined minimum coverage thresholds as set forth by the CSDCCA management. This minimum coverage, along with the cost-at-risk metric will guide CSDCCA's procurement strategies. The objective of the dual framework is to develop a procurement strategy focused on hedging against the risk of open load positions, as measured over time, and to mitigate CSDCCA exposure to market price volatility and other pricing risk. The actual covered positions taken by CSDCCA may deviate from the recommended coverages contained in the dual framework based upon staff evaluation of current market conditions and other applicable requirements (e.g., regulatory requirements).

Diversification of Portfolio: The CSDCCA will develop an integrated resource portfolio that includes a minimum level of diversification in fuel type, contract duration, geographic location, counterparties, pricing terms, cash reserves and types of products.

VIII. Start-Up Schedule and Milestones

This section provides a general overview of the main implementation requirements for establishing a CCA and discusses the main parties with which the CCA interacts, set up requirements, and CCA structure.

An implementation timeline for a CCA startup in 2021 shown in Table 13. The overall schedule is driven by CPUC requirements, which are shown in the second column.[18] While there are number of CPUC requirements for anew CCA, the factors driving the launch of the CCA are: submitting implementation plan for CPUC approval one year prior to launch; meeting the RA requirement filing requirements throughout the year prior to launch; and meeting the customer notification requirements 90 days before launch. The detailed CPUC process is also discussed in the following section.

Through both legislation and regulation, SDG&E is required to work cooperatively with a CCA during exploration, implementation, and operation of the CCA. During operation, SDG&E will provide electricity meter data to the CCA, bill customers, and remit customer payments back to the CCA. SDG&E is also required to include customer notices with the utility billing statements on a cost basis for the CCA. Some CCAs in CA did not use utility billing statement inserts opting instead to use direct-mail notices providing requisite information about enrollment and opt-out.

Prior to launch, the electronic communications between the CCA and SDG&E must be tested and verified. Communications with SDG&E will be vital to ensuring successful CCA transactions related to electric meter reading and billing. SDG&E uses the Electronic Data Interchange (EDI) standard to facilitate the electronic communications and data exchange with

[18] Per CPUC Resolution 4907.

CCAs. As part of the process of working with SDG&E to establish the CCA, SDG&E will conduct EDI testing to ensure that operational data exchange is functioning prior to the CCA commencing service.

Although not listed on the table, the CCA must also interact with the CAISO. CAISO is an independent non-profit organization which coordinates, controls, and monitors the state's transmission, generation, and electric energy markets. CAISO operates the CA wholesale power system which balances the need for higher transmission reliability with the need for lower costs. To become a CAISO market participant, a CCA must:

- Assign a certified Scheduling Coordinator (SC)[19] to manage bids in the CAISO ancillary service and energy markets. The SC must both be specially trained in CAISO procedures and must have access to a secure communications link to the CAISO system through either the Internet or through the Energy Communications Network (ECN).
- Develop and implement processes and systems to support resource interconnection
- Utilize appropriate metering and telemetry where required[20]
- Participate in CAISO energy markets and related market products[21]

The CCA's contracted power provider and/or SC addresses these requirements.

[19] CAISO Scheduling Coordinators: http://www.caiso.com/participate/Pages/SchedulingCoordinator/Default.aspx
[20] Metering and telemetry ensure operational accuracy: http://www.caiso.com/market/Pages/MeteringTelemetry/Default.aspx
[21] CAISO market processes and products: http://www.caiso.com/market/Pages/MarketProcesses.aspx

Table 13. Implementation Schedule

Time	PER CPUC Requirements	COORDINATION WITH SDG&E	Internal CCA
Mid-year			City Commit to CCA formation
Sept-Nov	Draft Implementation Plan		Establish City Enterprise/JPA/governance model
Dec-19	File Implementation Plan with CPUC		Hire CEO, Procurement Manager, Finance Manager, Operations Manager
Jan-20	CPUC notifies SDG&E CPUC confirms it has the Implementation Plan	CSD begins meetings with SDG&E to confirm its operations will conform with SDG&E's tariffs	Issue RFPs for: • Initial power provider • Scheduling coordinator (if separate) • EDI/ data management • Communications • Banking/finance services • Working capital loan
Feb-20	CCA provides draft customer notices to CPUC public advisor Within 15 Days, CPUC PA finalizes notice and returns to CCA CCA submit registration packet to CPUC (signed serve agreement with SDG&E, Bond amount currently $147,000)		
Mar-20	CPUC informs CCA regarding any Exit Fees If the registration packet is complete, the CPUC confirms Registration as a CCA.		Evaluate Responses to RFPs
Apr-20	April 1: CCA submits year ahead RA forecast		Negotiate with selected firms
May-20			
Jun-20			Have key contracts in place

Time	PER CPUC Requirements	COORDINATION WITH SDG&E	Internal CCA
Jul-20			Begin public roll out
Aug-20	CCA submits its updated year ahead RA forecast	CCA Service Agreement EDI Agreements Electronic Funds Transfer agreements	Set rate policies; NEM
Sep-20		Issue Binding Notice of Intent	
Oct-20	October 22: CCAs submit their January load migration forecast for the Resource Adequacy program.	EDI Testing	
Nov-20	Nov 1: Send out 1st opt out notice		Lock in power prices
Dec-20	Dec 1: Send out 2nd opt out notice	Dec 1: Receive Customers Mass enrollment information from SDG&E	Set rates/ NEM compensation
	Dec 31: Utility shall transfer all applicable accounts to the new supplier		
Jan-21	Begin service		

Set Up. The three main CCA set up requirements include participating in the Open Season, providing certain customer notifications, and undergoing electronic communications compliance testing as described below.

CCA Open Season[22] is a specific calendar period within which a CCA can voluntarily notify SDG&E of the planned implementation date of its program. This notification limits the CCA's exposure to additional stranded cost charges or exit fees. During Open Season, a CCA may submit a Binding Notice of Intent (BNI) informing SDG&E of the number of customers by class and date that the CCA will serve, including arrangements for phased service. SDG&E utilizes the BNI to modify power procurement forecasts to reflect loss of the CCA load, thus limiting the CRS. While Open Season participation is optional, it is an important tool for a CCA to limit customer cost exposure. Open Season occurs annually from January 1 through February 15 or as late as March 1 when the California Energy Commission (CEC) LSE Load Forecasts are due on or after May 1.

Customer Notifications, Opt-Out and Enrollment. CPUC Section 366.2(c)(3) contains several requirements regarding CCA customer notifications, enrollment, and opt-out rights.

A CCA must inform potential customers at least twice within two months (60 days) prior to the customers' designated date of CCA enrollment as follows:

- The customer is to be automatically enrolled in the CCA;
- The customer has the right to opt out of the CCA without penalty; and
- The terms and conditions of the services offered.

A similar notification must be made twice within two billing cycles subsequent to a customers' enrollment in the CCA. The CCA must pay SDG&E for providing these notices or can opt for direct mail notification.

A. Requirements per CPUC Resolution 4907

As noted above, the CPUC must review certain actions of newly-forming CCAs. CPUC Resolution E-4907 establishes the schedule for its process of review to coordinate the timeline of the mandatory forecast filings of the Commission's Resource Adequacy program to ensure that newly launched and expanding CCAs comply with Resource Adequacy requirements, as established by Section 380, before they serve customers.

[22] SDG&E Rule 27.2 Community Choice Aggregation Open Season: http://regarchive.SDG&E.com/tm2/pdf/ELEC_ELEC-RULES_ERULE_27_2.pdf

Table 14. CCA Implementation Schedule Per CPUC Resolution 4907

Date	Action
Day 1, Year 1 (On or before January 1 Year 1)	(1) The prospective or expanding CCA submits its Implementation Plan to Energy Division and serves it on selected docket service lists
Day 1 – 10, Year 1	(1) The CPUC notifies the Utility servicing the customers that are proposed for aggregation that an implementation plan initiating their CCA program has been filed.
Day 1 – 60, Year 1	(1) The CCA provides a draft customer notice to CPUC's Public advisor. (2) Within 15 days of receipt of the draft notice, the Public Advisor shall finalize that notice and send it to the CCA.
DAY 1 – 90, Year 1	(1) The CPUC sends a letter confirming that it has received the Implementation Plan and certifying that the CCA has satisfied the requirements of Section 366.2(c) (3). (2) The CPUC provides the CCA with its findings regarding any cost recovery that must be paid by customers of the CCA in order to prevent cost shifting. (P.U. Code Section 366.2 (c) (7).) (3) The CCA and the Utility should Meet-and-Confer regarding the CCA's ability to conform its operations to the Utility's tariff requirements.
DAY 1 – 90, Year 1	(1) The CCA submits its registration packet to the CPUC, including: a. Signed service agreement with the utility, b. CCA interim bond of $100,000 or as determined in R.03-10-003
Day 90 – 120, Year 1	(1) If the registration packet is complete, the CPUC confirms Registration as a CCA.
April, Year 1	(1) The CCA submits its year ahead Resource Adequacy forecast (P.U. Code Section 380)
August, Year 1	(1) The CCA submits its updated year-ahead RA forecast
October Year 1 (75 days before service commences)	(1) CCAs submit their Monthly load migration forecast for the Resource Adequacy program, filed about 75 days prior to the compliance month.
Within 60 days of the CCA's Commencement of Customer Automatic Enrollment	(1) The CCA shall send its first opt-out notice.

Date	Action
Within 30 days of the CCA's Commencement of Customer Automatic Enrollment	(1) The CCA shall send a second opt-out notice. (2) Once notified of a CCA program, the Utility shall transfer all applicable accounts to the new supplier
January 1, Year 2	(1) CCA begins service.

Appendix 1: Peer Review of Business Plan and MRW Response to Peer Review

EES Consulting

October 24, 2018

Ms. Cody Hooven
City of San Diego
202 C St.
San Diego, California 92101

SUBJECT: Peer Review Analysis of the Business Plan for the Formation of Community Choice Aggregation Program for the City of San Diego

Dear Ms. Hooven:

EES Consulting, Inc. (EES) was retained by the City of San Diego (City) to provide a peer review of the Community Choice Aggregation (CCA) Business Plan (Plan) (authored by MRW). EES is well qualified to provide this peer review based on our extensive work over the past 40 years in the areas of electric utility power supply planning and procurement, rates and regulatory analysis, utility formation and merger studies, and more recently with the emerging CCA programs in California.

EES is a registered professional engineering and management consulting firm that has been serving the utility industry since 1978. We currently have over 500 utility clients all across North America with our primary focus within the WECC reliability area. We have completed CCA Business Plans and/or Implementation Plans for the Counties of Los Angeles, Butte, San Bernardino and Alameda, plus Coachella Valley Association of Governments, West Riverside Council of Governments, along with the City of San Jose. EES has also performed peer review work for the Cities of Solana Beach, King City and now San Diego, and feasibility study work for the Cities of Encinitas, Oceanside, Del Mar, and Carlsbad. As such, EES is well-versed in CCA operations, San Diego Gas & Electric (SDG&E) rates, and CCA-related issues in California.

Scope of Services for EES

Our review of the City's Plan is focused on a technical analysis of load data, rate projections, and cost comparisons.

570 Kirkland Way, Suite 100
Kirkland, Washington 98033

Telephone: 425 889-2700 Facsimile: 425 889-2725

A registered professional engineering corporation with offices in Kirkland, WA, Portland, OR, and Indio, CA.

Conflict of Interest

EES has no professional relationship with the author of the study, MRW, or any party of interest. Our opinions expressed below are independent and based upon EES's past work for California CCAs and our knowledge of the electric utility industry.

Summary of EES Review

In summary, our peer review showed that the City and MRW have prepared a thorough, comprehensive Plan, which once updated, can be relied upon in the City's decision on whether or not to proceed with the formation of a CCA. EES does have some specific areas where we recommend further analysis or where different alternatives might be considered. The following sections provide our detailed comments related to the various sections of the Plan.

Detailed Comments on Methodology and Key Inputs

Load Forecast

Within the Plan, loads were analyzed in aggregate for residential and non-residential customers. The Plan could benefit from a more disaggregated approach according to SDG&E tariffs. For example, the California governor recently signed into law a bill (SB 237) that increases the cap on Direct Access customers. Generally, commercial and industrial customers are more likely to be direct access customers; however, the aggregate non-residential class also includes streetlighting and agriculture. While the Plan included the new cap on Direct Access, we suggest updating the calculation such that only commercial and industrial loads are analyzed for potential, new Direct Access service customer participation.[1]

The Plan assumes an opt-out rate of 5% for SDG&E's bundled customers. This assumption is consistent with what has been observed and is considered conservative based on the most recent opt-out rates in the 2-3% range.

Next, the Plan utilized one year of historic load data for the City as the basis of the forecast. Using one year of historic data may skew the results for certain weather characteristics. An analysis of historic heating and cooling degree days for the San Diego region would add confidence to the forecast load levels and shape observed in the historic year used in the Plan.

[1] Senate Bill 237 expands the cap on direct access load by 16%.

Finally, the Plan forecasts CCA loads to decrease on average by 0.2% per year from 2020 to 2029. This assumption is reasonable when compared with the California Energy Commission's (CEC) mid-demand baseline case mid-AAEE and mid-AAPV forecast showing negative growth averaging -0.6% annually for SDG&E customers.[2]

Startup Costs

Startup costs for a new CCA are estimated in the Plan at $5 million including feasibility analysis, power supply solicitation and contracting, staffing, technical consulting, legal counsel, marketing and communications, SDG&E service fees, CCA bond, equipment and lease, and contingencies. These startup costs are assumed to be financed over 5 years at 5% interest. These assumptions are conservative and reasonable.

An additional $120 million is added to startup costs based on three months of working capital. A three-month working capital requirement is conservative and may not be required if more favorable power supply terms are achieved through contract negotiations. For example, 60-day payment terms for power supply expenses would reduce working capital requirements accordingly. Further, the Plan correctly notes that a phase-in approach to start-up will also reduce working capital requirements at the beginning of implementation. In summary, the three months of working capital assumed in the Plan is appropriate and conservative.

Administrative and General

The Plan included ongoing administrative and general (A&G) costs. These costs include administration labor and non-labor costs, professional services, data management fees, and SDG&E meter and billing fees.

Data management fees are estimated based on $1.88/customer/month. This value is conservatively high compared with actual and observed CCA data management costs in the $1-$2/customer/month range. Generally, data management fees are reduced on a $/customer basis as the number of customers increases. Considering the size of a San Diego CCA, unit costs for data management might be closer to $1/customer/month. Regardless, the Plan's assumption in this regard is reasonable and conservative.

The other administrative costs (salaries at $2.5 million, non-labor at $1 million, and professional services $3.5 million) are reasonable based on CCA studies and EES's past experience.

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[2] California Energy Demand Forecast 2018-2030 Mid-Demand Baseline Case, Mid AAEE and AAPV Savings. February 16, 2018. Available Online: TN# 222583 https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=17-IEPR-03

Power Costs

The Plan assumes that 45% of renewable power will be sourced from utility-scale photovoltaic solar plants, 45% from wind turbines, and 10% from geothermal, biomass, or another baseload renewable. Utility scale solar projects with storage in California have been reported below $40/MWh. Similarly, the price for wind and geothermal are reasonably estimated at $54 and $75/MWh, respectively. Renewable power costs include 6% line losses, and average $61/MWh. This amount is in line with expected renewable energy costs which EES estimates to range from $58 to $65/MWh based on recent contracts and California market conditions. These assumptions in the Plan are conservative but appropriate.

The Plan correctly applies resource adequacy requirements at 115% of projected peak demand. The Plan estimates resource adequacy costs in the near-term at $3.50-$4/kW-mo. These estimates are consistent with what EES has observed in recent contract negotiations. After 2027, the Plan escalates these costs to long-term contracts which are significantly greater in cost at $30/kW-mo. Capacity costs become a large driver for increased SDG&E and CCA rates in the last half of the Plan period. This assumption is conservative and should be tested through more market research.

CAISO expenses are estimated at about $3/MWh,[3] which is also reasonable based on current rates.

PCIA

The exit fee or power charge indifference adjustment (PCIA) paid by CCA customers is based on the California Public Utilities Commission's (CPUC) Alternative Proposed Decision (APD) methodology in the Plan. The Plan forecasts the PCIA to begin at nearly 2.50 cents/kWh in 2020 and decline through the Plan period. The PCIA forecast in the Plan is developed based on public information on SDG&E's contracts, and current values for renewable energy, capacity, and wholesale market power prices. The power prices, capacity, and renewable energy values assumed in the study are consistent with what EES has observed in recent contracts. Therefore, the resulting PCIA forecast for 2020 is appropriate based on the 2019 PCIA tool and an escalation factor assumed by MRW.

Due to the confidential nature of these contracts, there is significant uncertainty around any PCIA forecast. It is appropriate to include sensitivity around the PCIA forecast, as MRW has done.

[3] Draft Business Plan Table 4.

SDG&E Generation Rate Forecast

SDG&E's system generation rate is currently estimated at $0.10/kWh for 2019. The Plan assumes this rate will remain fairly flat until 2023. After 2023, the SDG&E generation rate is assumed to increase by 2-3 percent annually until 2029. This escalation rate is reasonable given renewable and non-renewable generation costs increase by approximately 2-3% annually. After 2029, the Plan projects SDG&E rates to increase significantly so that they reach $0.18/kWh by 2035, or an average annual increase of 7%. This large rate increase follows the Plan's assumption that capacity costs escalate to $30/kW-mo toward the end of the Plan's study period.

Customer Programs

The Plan points out that for many jurisdictions, CCAs are a means for local control in customer program offerings. Authors should consider adding language about how the CCA can obtain access to public purpose and other funds for clean energy programs. Not all programs would need to be funded through CCA generation rates.

GHG Goals

The Plan states that the CCA must contract with new renewable generators to reduce GHG emissions. However, the CCA may also reduce GHG utilization through higher renewable power content purchases compared with SDG&E as this strategy does meet Climate Action Plan goals.

Summary of Recommendations

Based on our review, EES recommends the following updates to the Plan:

1. Analyze loads at the tariff level rather than residential vs. non-residential level.
2. Evaluate whether the historic year used for load analysis is reflective of normal weather conditions.
3. Adjust Direct Access customer loads based on tariff schedule rather than aggregated group (residential vs. non-residential).
4. Review and discuss specific assumptions for SDG&E generation rate forecast growth during later part of the Plan's study period.
5. Include sensitivity analysis that evaluates the break-even participation rate or "opt out" rate for the CCA.
6. Revise GHG discussion to state that higher renewable power purchases will help the City meet its Climate Action Plan goals.

Conclusion

EES concludes that the Plan provides a reasonable basis for evaluating the formation of a CCA within the City. The Plan's assumptions related to the load forecast, participation rates, resource portfolios, start-up costs, operating costs, exit fees, and resource prices all appear to be in the appropriate range and the rate savings estimates are appropriate.

We hope this peer review is responsive to your needs. Please feel free to contact us directly with any additional questions.

Very truly yours,

Gary Saleba
President

cc: Aaron Lu

October 24, 2018

Ms. Cody Hooven
Mr. Andrew Lu
City of San Diego
202 C St.
San Diego, California 92101

Dear Ms. Hooven and Mr. Lu:

pfm

601 South Figueroa Street
Suite 4500
Los Angeles, CA 90017
213.489.4075

pfm.com

Introduction

PFM Financial Advisors LLC (PFM) was hired by EES Consulting, Inc. (EES) as a sub-consultant to assist EES with its peer review of the Community Choice Aggregation (CCA) Business Plan for the City of San Diego (City). PFM has significant experience providing financial advice to utility clients both in California and across the country. We represent a majority of the public power entities in California and a majority of the members of the Large Public Power Council nationally. Of most relevance for this assignment, PFM has provided financial advice, business plan review, pro-forma review, rating planning and assistance with credit facility procurement/negotiation to a variety of CCAs. Of note, we have worked with Marin Clean Energy, the Clean Power Alliance (County of Los Angeles), Western Riverside Council if Governments, East Bay Clean Energy, CleanPowerSF and the City of San Jose.

PFM's review of the Community Choice Aggregation Business Plan is focused on the level of cash working capital requirements, financial management metrics, and the external financing assumptions.

Summary of PFM Review

In summary, our peer review showed that the underlying financial assumptions used by the City and MRW are largely conservative as outlined/asserted in the draft report. We believe the financial analysis is sound and provides a reliable basis to assist the City with its decision making. We have highlighted only the interest rate assumption of 5% from the September draft report where we believe the City and MRW may wish to be more conservative given recent interest rate trends. This was updated to 6% for the final report, which we believe is a good planning assumption today. However, the balance of what we have highlighted are a few suggestions where the City and MRW may wish to refine assumptions and be less conservative.

External Financing Assumptions

The September draft report has assumed 5% for the cost of borrowing. This has been a consistent assumption for several CCA business plans over the last few years and was until recently conservative. There are two underlying components of the cost of borrowing which are moving in opposite directions, but in total the cost of borrowing for a start-up CCA program has risen. First, the underlying interest rate index for the credit facilities is 1-month LIBOR which risen significantly over the last year and last reset at 2.23% after hovering close to 0% for many years. The credit spreads assessed by the bank lenders have been going down. Spreads had been in the 300 to 350 basis point range, but most recently have dropped under 300basis points. Current estimated borrowing cost for the City is right about 5.00%. Given the likelihood of Fed rate increases and upward pressure on short term rates the City and MRW may wish to use a higher assumption of say 6.00% to be a bit more conservative. This rate was updated for the final report to reflect a 6% rate which we believe is a good planning assumption today.

The draft report also assumes a 5-year level repayment assumption for the credit facility. We view this as a solidly conservative assumption as almost every CCA launched to date has been able to repay the credit facilities within 2 or 3 years.

Cash Working Capital Requirements

The $120MM working capital assumption is high relative to comparably sized programs. PFM views this as a very conservative assumption. The City and MRW could consider something substantially lower. PCE, EBCE, San Jose and CPA are all comparable in terms of ultimate size to San Diego and the maximum credit facility size any of them needed was $55MM.

Financial Management Metrics

The assumptions related to Operating Reserve and Rate Stabilization reserve targets are right in line with other programs. PFM would note that reserve targets will be mandated by the bank as part of negotiations for the credit support facility for the program. We recognize there are many demands on excess monies, but wanted to make sure the City and MRW understood that some of the reserve requirements won't be optional.

Please feel free to contact me directly with any questions.

PFM Financial Advisors LLC

Michael Berwanger

Managing Director

Memorandum

To: Aaron Lu, Program Coordinator Sustainability Department
City of San Diego

From: Mark Fulmer

Subject: Responses to the Recommendations in the October 23, 2018 draft "Peer Review Analysis of the Business Plan for the Formation of Community Choice Aggregation Program For the City of San Diego" And the PFM Review of the Business Plan's Financial Assumptions

Date: October 24, 2018

On September 27, 2018, EES Consulting provided a peer review of the September 17, 2018 Draft CCA Business Plan. On October 23, EES provided a slighted updated version of the peer review memo. In those review, EES recommended six updates to be made to the Business Plan prior to finalization.

This memo describes how MRW incorporated EES's recommendations into the final Business Plan and responds to the September 26, 2018 letter from Michael Berwanger of PFM Financial Advisors LLC recommendations concerning the Business Plan's financial assumptions.

From EES Consulting's peer review memo:

1. ***Analyze loads at the tariff level rather than residential vs. non-residential level.***

Consistent with the load analysis performed in the CCA Feasibility Study, the loads were initially synthesized at the major tariff level. It is presented in an aggregate form in the Business Plan for the sake of simplicity.

2. ***Evaluate whether the historic year used for load analysis is reflective of normal weather conditions.***

MRW reviewed the sales forecasts from SDG&E's 2018 and 2019 Energy Resource Recovery Account ("ERRA") applications, as well as historic loads going back to 2011. The total loads used in the Business Plan are consistent with these prior years.

3. ***Adjust Direct Access customer loads based on tariff schedule rather than aggregated group (residential vs. non-residential).***

Existing Direct Access load was not included in the base forecast load of the CCA. The language in the Business Plan has been revised to clarify this. The additional DA load that will occur from the passage of Senate Bill 237 is taken pro-rata from the commercial and industrial (e.g., AL-TOU) classes only, and the "opt-out" sensitivity case accounts for incremental additional load loss from further expansion of the Direct Access program.

4. ***Review and discuss specific assumptions for SDG&E generation rate forecast growth during later part of the Plan's study period.***

The assumptions concerning SDG&E's generation rates in the latter years were reviewed and modified. In particular, the treatment of incremental capacity costs was refined/corrected. MRW thanks EES for calling this anomaly to our attention. Also, a fuller discussion of the SDG&E rate forecast is included in the revised Business Plan.

5. ***Review PCIA ruling after the October 11 CPUC meeting and revise PCIA forecast accordingly.***

The PCIA forecast modeling in the revised Business Plan reflects the outcome of the October 11 CPUC meeting.

6. **Include sensitivity analysis that evaluates the break-even participation rate or "opt out" rate for the CCA.**

See response to question 3. A sensitive case has been added reflecting additional DA load departure.

<u>From PFM Financial Advisor's letter:</u>

1. ***Consider increasing the cost of borrowing from 5% to 6%.***

This recommendation is included in the Final Business Plan.

2. ***Overly conservative assumptions on Cash Working Capital***

PFM states that the working capital assumption of $120 million was particularly conservative, based on their observation that other similar-sized CCAs have not needed more that $55 million. MRW acknowledges this, but chose to keep the more conservative assumption in the analysis.

Appendix 2: Full Study Period Pro Formas

MRW Financial Analysis of the CSD CCA

OCT 15 2018

	2020	2021	2022	2023	2024	2025	2026	2027
Expenses								
Cost of Power (including losses)	$394,304,793	$394,869,396	$409,402,887	$421,860,980	$433,461,429	$444,366,585	$460,279,221	$477,038,833
O&M/A&G Costs	$16,127,196	$16,125,624	$17,114,854	$17,548,899	$17,985,101	$18,403,161	$18,774,799	$19,139,255
Total Expenses	**$410,431,989**	**$410,995,020**	**$426,517,741**	**$439,409,879**	**$451,446,530**	**$462,769,747**	**$479,054,020**	**$496,178,088**
Debt Service	**$0**	**$25,212,069**	**$25,212,069**	**$25,212,069**	**$25,212,069**	**$25,212,069**	**$0**	**$0**
Total Revenue Requirement	**$410,431,989**	**$436,207,089**	**$451,729,810**	**$464,621,948**	**$476,658,599**	**$487,981,816**	**$479,054,020**	**$496,178,088**
Total Load, MWh	6,256,282	6,238,512	6,300,490	6,303,783	6,308,261	6,301,509	6,275,441	6,238,575
SDG&E CCA Customer Charges, $/MWh (before Reserve Fund Adjustment)								
Average CSD CCA generation	$65.6	$69.9	$71.7	$73.7	$75.6	$77.4	$76.3	$79.5
SDG&E average exit fees for CCA load	$24.7	$24.7	$23.2	$22.7	$23.0	$23.3	$22.4	$22.0
Total CCA customer rate	**$90.3**	**$94.7**	**$94.9**	**$96.4**	**$98.6**	**$100.8**	**$98.7**	**$101.5**
SDG&E average gen rate for CCA load, $/MWh	**$101.6**	**$102.0**	**$101.8**	**$104.0**	**$106.9**	**$109.4**	**$113.3**	**$115.3**
Reserve Fund Adjustment	15%							
Target	$61,564,798	$65,431,063	$67,759,472	$69,693,292	$71,498,790	$73,197,272	$71,858,103	$74,426,713
Reserve Fund Adjustment								
Potential Reserve potential	$70,872,598	$45,625,038	$43,590,746	$47,780,828	$52,175,279	$54,441,137	$91,421,966	$86,237,114
Potential Reserve additions	$61,564,798	$3,866,265	$2,328,408	$1,933,821	$1,805,498	$1,698,483	$0	$1,229,441
Subtractions from reserve fund	$0	$0	$0	$0	$0	$0	$0	$0
Reserve fund total	**$61,564,798**	**$65,431,063**	**$67,759,472**	**$69,693,292**	**$71,498,790**	**$73,197,272**	**$73,197,272**	**$74,426,713**
CSD CCA Customer Charges, $/MWh (with Reserve Fund Adjustment)								
Rate adjustment from Reserve Fund	$9.8	$0.6	$0.4	$0.3	$0.3	$0.3	$0.0	$0.2
Average CSD CCA rate	$75.4	$70.5	$72.1	$74.0	$75.8	$77.7	$76.3	$79.7
SDG&E average exit fees for CCA load	$24.7	$24.7	$23.2	$22.7	$23.0	$23.3	$22.4	$22.0
Total CCA customer rate	**$100.1**	**$95.3**	**$95.2**	**$96.7**	**$98.9**	**$101.0**	**$98.7**	**$101.7**

Debt service

Start-up costs	$5,000,000
working Capital	$101,202,408
Total	$106,202,408
Interest rate	*6%*
term, years	5

MRW Financial Analysis of the CSD CC/

OCT 15 2018

	2028	2029	2030	2031	2032	2033	2034	2035
Expenses								
Cost of Power (including losses)	$576,520,582	$664,654,045	$783,252,160	$802,546,337	$822,485,081	$843,873,579	$867,358,527	$892,835,771
O&M/A&G Costs	$19,486,989	$19,823,282	$20,165,538	$20,545,000	$20,921,898	$21,309,303	$21,720,118	$22,141,146
Total Expenses	**$596,007,570**	**$684,477,326**	**$803,417,698**	**$823,091,337**	**$843,406,979**	**$865,182,883**	**$889,078,645**	**$914,976,917**
Debt Service	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Revenue Requirement	**$596,007,570**	**$684,477,326**	**$803,417,698**	**$823,091,337**	**$843,406,979**	**$865,182,883**	**$889,078,645**	**$914,976,917**
Total Load, MWh	6,201,364	6,159,321	6,115,046	6,078,424	6,042,021	6,005,837	5,969,869	5,934,117
SDG&E CCA Customer Charges, $/MWh (before Reserv								
Average CSD CCA generation	$96.1	$111.1	$131.4	$135.4	$139.6	$144.1	$148.9	$154.2
SDG&E average exit fees for CCA load	$18.6	$15.5	$11.1	$10.3	$9.6	$5.4	$3.2	$0.0
Total CCA customer rate	**$114.7**	**$126.7**	**$142.4**	**$145.7**	**$149.2**	**$149.5**	**$152.1**	**$154.2**
SDG&E average gen rate for CCA load, $/MWh	**$120.2**	**$128.7**	**$145.3**	**$154.5**	**$164.7**	**$171.8**	**$174.9**	**$180.4**
Reserve Fund Adjustment								
Target	$89,401,136	$102,671,599	$120,512,655	$123,463,701	$126,511,047	$129,777,432	$133,361,797	$137,246,538
Reserve Fund Adjustment								
Potential Reserve potential	$33,775,244	$12,349,845	$17,228,995	$53,822,209	$93,687,476	$133,801,282	$136,065,966	$155,548,344
Potential Reserve additions	$14,974,422	$12,349,845	$17,228,995	$4,483,725	$3,047,346	$3,266,386	$3,584,364	$3,884,741
Subtractions from reserve fund	$0	$0	$0	$0	$0	$0	$0	$0
Reserve fund total	**$89,401,136**	**$101,750,980**	**$118,979,976**	**$123,463,701**	**$126,511,047**	**$129,777,432**	**$133,361,797**	**$137,246,538**
CSD CCA Customer Charges, $/MWh (with Reserve Fun								
Rate adjustment from Reserve Fund	$2.4	$2.0	$2.8	$0.7	$0.5	$0.5	$0.6	$0.7
Average CSD CCA rate	$98.5	$113.1	$134.2	$136.1	$140.1	$144.6	$149.5	$154.8
SDG&E average exit fees for CCA load	$18.6	$15.5	$11.1	$10.3	$9.6	$5.4	$3.2	$0.0
Total CCA customer rate	**$117.1**	**$128.7**	**$145.3**	**$146.4**	**$149.7**	**$150.0**	**$152.7**	**$154.8**

Debt service

Start-up costs
working Capital
Total
Interest rate
term, years

Scenario	2	2. Accelerated RPS		Excess RE % Sold	50%			
losses:	6%							
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
CCA Load Forecast (MWh)	6,772,211	6,754,441	6,816,419	6,819,713	6,824,191	6,817,438	6,791,370	6,754,505
RPS %								
1. SB 350 RPS Requirement	33%	40%	42%	43%	45%	47%	48%	50%
2. Accelerated RPS	50%	52%	55%	57%	60%	63%	66%	69%
Renewable Requirement (MWh)	3,386,105.75	3,536,943.15	3,738,209.34	3,916,896.39	4,104,836.20	4,294,716.97	4,480,633.29	4,667,068.51
Renewable Portfolio (%)								
Wind	45%	45%	45%	45%	45%	45%	45%	45%
Solar	45%	45%	45%	45%	45%	45%	45%	45%
Baseload (e.g., Geothermal)	10%	10%	10%	10%	10%	10%	10%	10%
Large Hydro/Market (% of non-RPS)	0%	0%	0%	0%	0%	0%	0%	0%
Renewable Portfolio (MW)								
Wind	550	575	608	637	667	698	728	759
Solar	710	742	784	822	861	901	940	979
Baseload (e.g., Geothermal)	43	45	47	50	52	54	57	59
Portfolio (MWh)								
Wind	1,523,748	1,591,624	1,682,194	1,762,603	1,847,176	1,932,623	2,016,285	2,100,181
Solar	1,523,748	1,591,624	1,682,194	1,762,603	1,847,176	1,932,623	2,016,285	2,100,181
Baseload (e.g., Geothermal)	338,611	353,694	373,821	391,690	410,484	429,472	448,063	466,707
Large Hydro/Market	-	-	-	-	-	-	-	-
Excess RE Sold (keep RECs)	39,657	54,611	74,378	98,069	126,601	159,933	197,933	240,778
Makeup RECs Purchases	39,657	54,611	74,378	98,069	126,601	159,933	197,933	240,778
Total Market Purchases	3,465,420	3,326,719	3,226,966	3,098,955	2,972,557	2,842,587	2,706,603	2,568,992
Price Forecasts ($/MWh)								
Wind	53.35	53.35	53.35	53.35	53.35	53.35	54.55	55.80
Solar	42.01	42.01	42.01	42.01	42.01	42.01	42.96	43.94
Baseload (e.g., Geothermal)	75.50	75.50	75.50	75.50	75.50	75.50	77.20	78.96
Market Renewables	55.57	55.57	55.57	55.57	55.57	55.57	56.82	58.11
Market Purchases (w/o GHG)	26.59	24.76	25.30	26.11	26.65	27.26	27.81	28.53
Wholesale GHG cost	6.30	6.72	7.21	7.76	8.25	8.80	9.39	10.09
Market Purchases (w GHG)	32.89	31.48	32.50	33.87	34.90	36.06	37.19	38.62
Portfolio Costs ($)								
Wind	81,291,934	84,913,163	89,745,061	94,034,890	98,546,855	103,105,418	109,997,524	117,185,807
Solar	64,012,636	66,864,142	70,668,978	74,046,968	77,599,876	81,189,477	86,616,607	92,276,959
Baseload (e.g., Geothermal)	25,565,098	26,703,921	28,223,480	29,572,568	30,991,513	32,425,113	34,592,578	36,853,185
Large Hydro	-	-	-	-	-	-	-	-
Makeup RECs Purchases	899,037.37	1,315,150	1,715,272	2,127,147	2,615,638	3,119,753	3,884,445	4,693,969
Wholesale Market Purchases	113,342,164	103,874,613	103,679,042	103,315,429	101,546,242	99,615,499	96,989,832	94,564,079
Capacity Market Purchases	60,311,302	49,864,609	51,423,233	52,634,678	53,862,781	54,626,755	55,148,564	55,568,810
CAISO costs	18,998,219	18,344,458	19,000,029	19,565,242	20,083,960	20,574,511	21,297,625	22,062,855
Total Cost ($)	**381,691,500**	**368,556,835**	**381,727,848**	**393,083,506**	**403,505,012**	**413,360,627**	**427,888,652**	**443,262,805**
Total Cost Renewable	189,804,420	198,674,995	210,339,834	220,758,637	231,778,040	242,922,936	259,775,724	277,365,963
Total Cost non-Renewable	101,654,920	90,875,914	90,052,143	89,259,864	87,404,398	85,558,070	83,208,953	81,227,186
Total Cost GHG	23,588,171.52	23,905,533.61	24,513,198.10	24,903,684.84	24,804,199.76	24,517,057.14	23,964,810.94	23,266,121.42
Total Cost Capacity	66,643,988.80	55,100,392.57	56,822,672.75	58,161,319.33	59,518,373.54	60,362,564.24	60,939,163.47	61,403,534.62

Scenario
losses:

	2028	2029	2030	2031	2032	2033	2034	2035
CCA Load Forecast (MWh)	6,717,293	6,675,251	6,630,975	6,594,353	6,557,951	6,521,766	6,485,798	6,450,046
RPS %								
1. SB 350 RPS Requirement	52%	53%	55%	55%	55%	55%	55%	55%
2. Accelerated RPS	72%	76%	79%	83%	87%	91%	95%	100%
Renewable Requirement (MWh)	4,860,865.92	5,058,893.93	5,263,008.47	5,481,476.38	5,709,027.77	5,946,041.00	6,192,910.24	6,450,046.10
Renewable Portfolio (%)								
Wind	45%	45%	45%	45%	45%	45%	45%	45%
Solar	45%	45%	45%	45%	45%	45%	45%	45%
Baseload (e.g., Geothermal)	10%	10%	10%	10%	10%	10%	10%	10%
Large Hydro/Market (% of non-RPS)	0%	0%	0%	0%	0%	0%	0%	0%
Renewable Portfolio (MW)								
Wind	790	822	855	891	928	966	1,007	1,048
Solar	1,020	1,061	1,104	1,150	1,198	1,248	1,299	1,353
Baseload (e.g., Geothermal)	62	64	67	70	72	75	79	82
Portfolio (MWh)								
Wind	2,187,390	2,276,502	2,368,354	2,466,664	2,569,062	2,675,718	2,786,810	2,902,521
Solar	2,187,390	2,276,502	2,368,354	2,466,664	2,569,062	2,675,718	2,786,810	2,902,521
Baseload (e.g., Geothermal)	486,087	505,889	526,301	548,148	570,903	594,604	619,291	645,005
Large Hydro/Market	-	-	-	-	-	-	-	-
Excess RE Sold (keep RECs)	289,271	343,774	404,284	471,699	545,560	626,008	713,206	807,251
Makeup RECs Purchases	289,271	343,774	404,284	471,699	545,560	626,008	713,206	807,251
Total Market Purchases	2,434,969	2,303,905	2,176,534	2,056,274	1,940,044	1,827,742	1,719,301	1,614,503
Price Forecasts ($/MWh)								
Wind	57.00	58.21	59.45	60.77	62.09	63.45	64.89	66.37
Solar	44.89	45.83	46.81	47.85	48.89	49.97	51.10	52.26
Baseload (e.g., Geothermal)	80.67	82.37	84.13	86.00	87.87	89.80	91.83	93.92
Market Renewables	59.37	60.62	61.92	63.29	64.67	66.09	67.58	69.12
Market Purchases (w/o GHG)	29.28	30.01	33.97	34.50	34.87	35.16	35.33	35.59
Wholesale GHG cost	10.83	11.64	12.55	12.75	12.91	13.04	13.10	13.23
Market Purchases (w GHG)	40.11	41.65	46.51	47.25	47.78	48.19	48.44	48.81
Portfolio Costs ($)								
Wind	124,686,707	132,508,515	140,799,755	149,903,128	159,520,070	169,781,546	180,837,151	192,631,402
Solar	98,183,478	104,342,694	110,871,560	118,039,933	125,612,711	133,693,023	142,398,664	151,685,945
Baseload (e.g., Geothermal)	39,212,106	41,671,948	44,279,419	47,142,294	50,166,678	53,393,759	56,870,582	60,579,697
Large Hydro	-	-	-	-	-	-	-	-
Makeup RECs Purchases	5,571,009	6,523,675	6,227,807	7,567,350	9,215,965	11,202,634	13,657,496	16,393,962
Wholesale Market Purchases	91,866,101	88,792,348	91,837,266	86,018,654	79,658,579	72,997,919	66,002,394	59,107,765
Capacity Market Purchases	130,486,337	200,327,948	300,564,480	301,923,627	302,928,606	303,751,726	304,549,988	305,106,902
CAISO costs	26,950,316	31,579,192	38,201,916	39,082,724	39,990,644	40,965,133	42,037,395	43,202,812
Total Cost ($)	**541,456,341**	**634,454,676**	**767,511,217**	**785,207,460**	**803,448,383**	**823,026,771**	**844,569,484**	**867,983,769**
Total Cost Renewable	295,756,897	314,976,749	333,907,288	356,531,239	380,689,544	406,718,414	435,109,101	465,526,562
Total Cost non-Renewable	79,288,721	77,331,289	82,511,658	79,366,595	75,910,137	72,369,788	68,691,738	65,314,080
Total Cost GHG	22,223,319.93	20,784,255.29	18,968,520.81	15,684,018.13	12,112,592.39	8,292,911.83	4,240,907.33	-
Total Cost Capacity	144,187,402.00	221,362,382.51	332,123,750.24	333,625,607.57	334,736,109.98	335,645,657.60	336,527,736.85	337,143,126.38