



Business Plan and Risk Assessment

December 2015



TABLE OF CONTENTS

I.	Executive Summary	6
II.	Program Goals and Design	7
A.	Affordable and Reliable Service	7
B.	Cleaner Electricity Alternatives	7
C.	Local Renewable Projects and Local Jobs	7
D.	Long-term Rate and Financial Stability	7
III.	Market Conditions and Timing	8
A.	CleanPowerSF’s Market	8
1.	Retail Electricity Market in San Francisco.	8
2.	Supply Market Conditions	11
B.	Phasing Plan	13
C.	Base Case Assumptions and <i>Pro Forma</i>	14
1.	Assumptions	15
2.	CleanPowerSF Base Case Sources and Uses of Funds	16
D.	Sensitivities	17
E.	Risk Management	18
1.	Risks to Affordability	18
2.	Risks to Cleaner Alternatives	19
3.	Risks to Local Projects and Jobs	20
4.	Risks to Financial Stability	20
5.	Other Risks	20
IV.	Operations	21
A.	Organization and Management	21

1.	San Francisco Board of Supervisors	22
2.	San Francisco Public Utilities Commission.....	23
3.	Local Agency Formation Commission	23
4.	Rate Fairness Board	24
B.	Supply	24
1.	Approach.....	24
2.	Product Content Policy	27
3.	Local projects.....	29
4.	Local Jobs projections.....	32
C.	Rate Setting.....	34
D.	Back-office Services	35
E.	Service Offerings and Comparison with PG&E	35
F.	Other Activities	35
1.	Regulatory Advocacy.....	35
2.	Legal	36
V.	Financial Structure and Management	36
A.	Financial Structure	36
B.	Power Enterprise Support	37
C.	Reserve Policy	38
D.	Organization and Responsibilities	39
VI.	Execution	40
A.	Overview.....	40
1.	Governance Policies.....	40
B.	Performance Reporting Policy and Metrics.....	40

TABLE OF TABLES

Table 1: Average Usage and Current Suppliers for Potential Customers.....	8
Table 2: Strata for Residential and Commercial Customers.....	9
Table 3. Sensitivity Analyses.....	18
Table 4: Expected Operating Procedures.....	22
Table 5: Summary of California's RPS Requirements.....	28
Table 6: CleanPowerSF's Plans for Net Metering and FiT.....	30
Table 7: CleanPowerSF's Planned Activities for Energy Efficiency, Demand Response and Other Programs	31
Table 8: CleanPowerSF Phase 1 Positions and Functions.....	33
Table 9: CleanPowerSF Phase 1 Job Creation.....	34
Table 10: Financial Support Being Provided to CleanPowerSF by Power Enterprise	37
Table 11: Expected Financing Requirements	39
Table 12: Governance Structure for CleanPowerSF.....	40
Table 13: Recommended Performance Reporting Policy and Metrics.....	41
Table 14: Bill Comparison for Typical Residential Non-CARE Customers.....	43
Table 15: Bill Comparison for Typical Residential CARE Customers	43
Table 16: Bill Comparison for Typical Small Commercial Customer	43

TABLE OF FIGURES

Figure 1: Electric Usage for Bundled Customers	10
Figure 2: Monthly Usage and Coincident Peak Demands for Potential Participants	10
Figure 3: Historic Trends for PG&E Generation Rate and Renewable Supply Costs.....	11
Figure 4: Forward Electric Prices in Northern California	12
Figure 5: Phasing Plan for Program Expansion.....	13
Figure 6: Base Case Sources and Uses	16
Figure 7: Stylized Portfolio of Resources (Year 1)	25
Figure 8: Stylized Capacity Addition (Year 2)	26
Figure 9: Resource Planning and Procurement Process	27

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I. Executive Summary

CleanPowerSF is San Francisco's Community Choice Aggregation (CCA) program, with an April 2016 target launch date. Authorized under State law, the CCA program allows cities and counties to partner with local investor owned electric utilities to provide additional choice in the sources of energy generated and delivered to residents and businesses. Under CleanPowerSF, PG&E will continue to maintain the power grid, respond to outages and collect payment. CleanPowerSF will replace the generation component of the bill with a new charge that represents cleaner sources of energy.

The San Francisco Public Utilities Commission conducted a comprehensive analysis into the financial viability of CleanPowerSF. The analysis balanced the defined programmatic goals with current and forecasted market conditions to better understand the program's long-term financial sustainability. The programmatic goals of CleanPowerSF include affordable and reliable service, cleaner electricity alternatives, local renewable projects and jobs, and long-term rate and financial stability.

Additionally, we conducted analysis into identifying program risks and available mitigations. The risks we identified are linked to the programmatic goals of affordability, cleaner alternatives, local projects and jobs, and financial stability. Some of the specific risks include changes to PG&E's rates, renewable supply availability, impact on local jobs, and the ability to scale up the program.

We further identified key program variables and conducted a sensitivity analysis to understand potential variations in operation and financial stability. The sensitivities analyzed include variances on the customer opt-out preference, PG&E rates, renewable portfolio content, and supply management policy.

We are cautious but optimistic about the launch of CleanPowerSF. Based on a 5 year projection for the initial phase of the program (50 avg. MW), we forecast the contribution to the operating margin to be approximately 6.5%. From this net operating margin, we must fund the contingency/rate stabilization fund, the repayment of working capital loans, and any additional efforts as guided by the program decision makers. Under the current projections, this margin will be tight but manageable.

It is our recommendation to initiate the program with a focus on securing long-term financial stability to allow for ongoing stable operations and a prudent expansion from Phase 1 to the complete San Francisco customer base. A phasing policy determined on ensuring financial stability will allow CleanPowerSF to provide clear benefits to the City and County of San Francisco with a reasonable consideration of the potential risks from changing market conditions.

II. Program Goals and Design

A. Affordable and Reliable Service

CleanPowerSF expects to offer electric generation rates to CCA customers that are competitive with PG&E generation rates. CleanPowerSF is committed to providing equitable treatment of all classes of customers without undue discrimination in setting rates.

B. Cleaner Electricity Alternatives

CleanPowerSF intends to exceed State of California requirements for the purchase of renewable energy by retail electric providers (California's Renewable Portfolio Standard (RPS)) and has set a goal of providing a default "Green" product that is 33% to 50% renewable and a premium "Super Green" product that is 100% renewable, using California-sourced renewable energy at program launch. The supply alternatives will consist of power purchases from in-state generators as well as generators owned and operated by CleanPowerSF and its partners; our plan does not rely on purchasing Tradable Renewable Energy Credits or renewable energy from generators not able to deliver energy into the California grid. The target for the default Green product will, at a minimum, immediately achieve the RPS requirement of providing 33% of power from eligible renewable resources by 2020.

C. Local Renewable Projects and Local Jobs

CleanPowerSF will meet its renewable goals, to the extent feasible, through new, preferably local renewable generating capacity and demand-side efforts, including energy efficiency and conservation programs. CleanPowerSF will 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 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 SFPUC would consider any environmental review documents prepared by the City or other lead agency in compliance with CEQA and, if it approves such projects, the SFPUC would adopt any required CEQA findings as part of such approval actions.

D. Long-term Rate and Financial Stability

CleanPowerSF intends to maintain long-term stability of the rates that it offers its customers as well as its own financial condition. This will be accomplished through financially responsible 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.

III. Market Conditions and Timing

A. CleanPowerSF's Market

Two markets are critical to CleanPowerSF: the customers that it will serve and the electric generating resources that it will use to serve them. The following section summarizes these markets.

1. Retail Electricity Market in San Francisco.

At the present time, there are four broad categories of electricity customers in San Francisco: residential customers served by PG&E (“bundled”); bundled commercial customers; customers served by Electric Service Providers (ESPs) in the direct access market; and customers of the SFPUC’s Power Enterprise. Under state law, only the first three categories of customers are eligible to receive electric service from CleanPowerSF. Electricity customers currently served by the SFPUC are ineligible for CCA service. The following table summarizes the average usage and current suppliers for these customers.

Table 1: Average Usage and Current Suppliers for Potential Customers

	# of Accounts	Average Class Usage (Avg. MW/yr)	Supplier
Residential	349,000	152	PG&E
Commercial/Other	33,000	330	PG&E
Direct Access	552	60	ESPs
Power Enterprise ¹	2,300	110	SFPUC

Source: Aggregation of 2013 customer data provided by PG&E pursuant to 2013 Item 16 Customer Data, and Power Enterprise meter data management system.

The largest class in terms of number of customers is the residential customer class. However, the largest class of customers in terms of usage is the commercial customer class. Both of these customer groups are served by PG&E. The Direct Access customers are almost exclusively commercial customers that take generation service from third party suppliers called Electric Service Providers. ESPs provide essentially the same retail generation service that CleanPowerSF would provide. The Power Enterprise class, a mix of commercial and residential customer classes, is already served by SFPUC.

The residential and commercial customer classes consist of different size strata. The following table summarizes the range of usage for these two customer classes.

¹ Excludes wholesale and Treasure Island customers.

Table 2: Strata for Residential and Commercial Customers

Monthly Average Statistics (2013)				
	Rate Schedules	Customer Count	Total Usage (kWh)	Avg. Usage, (kWh/customer)
Residential CARE		55,000	19,547,000	400
Residential Non CARE		294,000	94,477,000	300
Residential Subtotal	E1, E6, E7, E8, E9	349,000	114,024,000	300
Small Commercial	A1, A6, A15	29,000	48,732,000	2,000
Medium Commercial	A10	3,000	45,274,000	15,000
Large Commercial	E19	1,000	75,736,000	76,000
Industrial	E20	80	70,961,000	887,000
EV	EV	50	18,000	400
Agricultural	AG	20	165,000	8,000
Total		383,000	354,911,000	900

Source: PG&E 2013 Item 16 customer data.

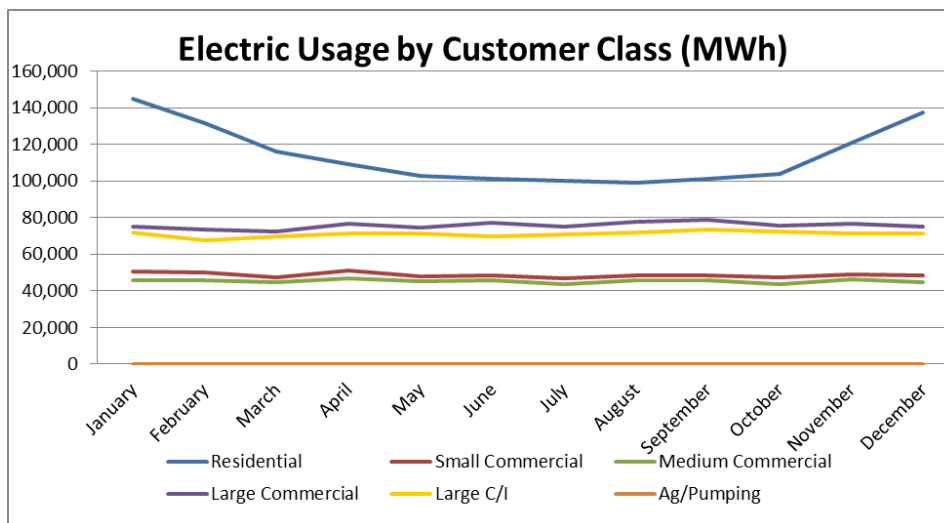
The Non Care residential customer group is the single largest number of potential customers for CleanPowerSF. There are far fewer commercial customers but their average usage is much greater than for residential customers.

While all of the customers identified above are potential customers of CleanPowerSF, is it more likely that large commercial, industrial, and Direct Access customers will opt out from participation in CleanPowerSF, at least initially. This is because they are likely more satisfied with the service that they receive from their current suppliers.² Residential and small/medium commercial customers are less likely to opt out from service from CleanPowerSF.

Different categories of customers use different amounts of energy throughout the year. The following figure presents the electric usage by class and month for all customers except the Direct Access and Power classes (i.e., the PG&E “bundled” customers).

² CleanPowerSF expects that given the level of customer care (with assigned account representatives) that large commercial and Direct Access customers receive, they would be harder to get to participate in the program at the outset. However, CleanPowerSF intends to work with these customers to understand their needs and interests so that it can provide a compelling service offering.

Figure 1: Electric Usage for Bundled Customers

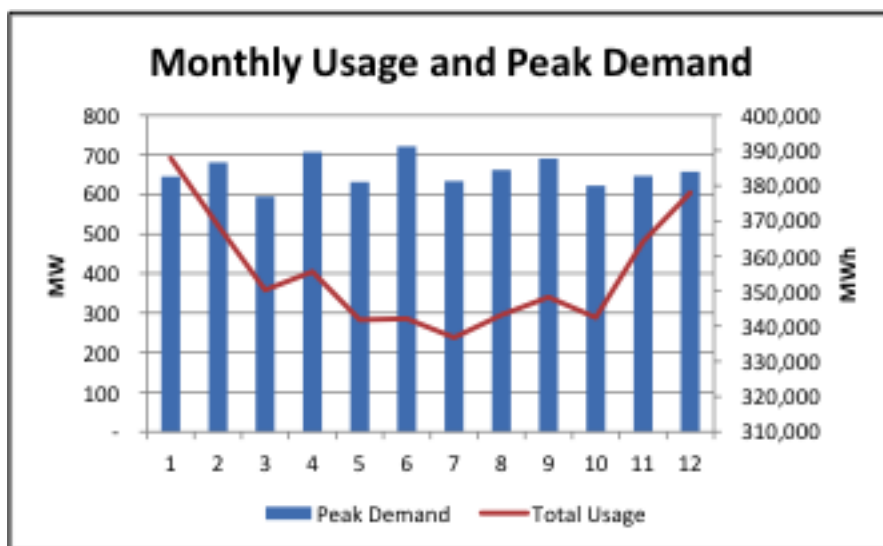


Source: PG&E 2013 Customer Data.

This data shows that residential customers tend to use more electricity during the winter months and less during the summer, while most other customer classes tend to have more similar loads throughout the year. As a result, the collective monthly usage shape for these customers is higher in the winter and lower in the summer.

Customers have their peak demands at different times of the year as well. The following presents the monthly-average usage and peak demand for bundled customers in San Francisco.

Figure 2: Monthly Usage and Coincident Peak Demands for Potential Participants



Source: PG&E 2013 Customer Data.

The figure shows that while monthly total usage peaks in the winter months, peak demand is relatively constant across the year but that the highest peak demands occur in April, June, and

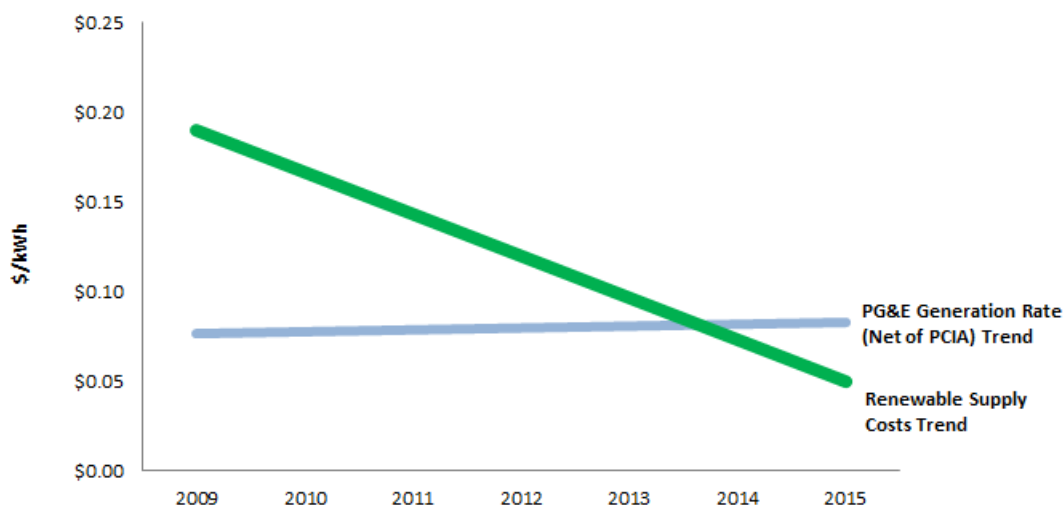
September. The higher peak demands in the summer months are a result of higher cooling loads for commercial customers.

2. Supply Market Conditions

CleanPowerSF plans to offer its customers greater levels of renewable energy than PG&E. Such an approach would reduce the carbon footprint for customers taking service from CleanPowerSF, and thereby for the San Francisco community. This supply portfolio will have less price volatility than a portfolio that is more dependent on fossil fuels since renewable resources typically have higher fixed costs but lower variable operating costs than non-renewable resources.

Historically, the costs of renewable energy have been much higher than the cost of non-renewable energy. However, in the last few years, renewable supply costs have fallen significantly. The following figure presents the historical trend in the cost of renewable resources relative to PG&E's generation costs (adjusted for the PCIA surcharge that CCA customers are obligated to pay PG&E).

Figure 3: Historic Trends for PG&E Generation Rate and Renewable Supply Costs



Source: Renewable Supply Costs Trend: 2009 Sunset Reservoir 5MW Renewable Energy Power Purchase Agreement (Contract #CS-921); 2012 Shell Indication Pricing per CCA BoS 09_18_12 presentation; and January 2014 Black & Veatch SFPUC Renewable Energy Assessment report.
PG&E Generation Rate (net of PCIA) trend: System Average rate per PG&E AET Advice Letters (2009-3349EA, pg. 18; 2010-3518EA, pg. 18; 2011-3727EA, pg. 19; 2012-3896EB, pg. 36; 2013-4096E, pg. 36; 2014-4278EB, pg. 229; 2015-4484EA, pg. 194; 2016-4696E, pg. 23).

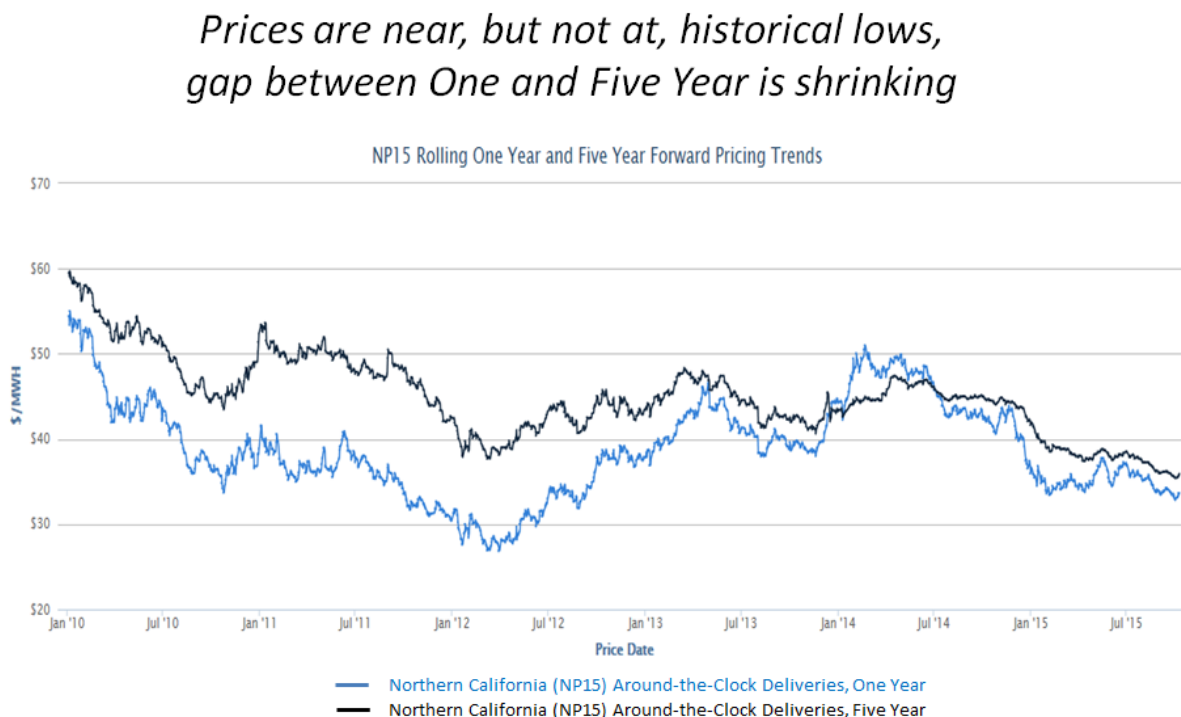
As seen in this figure, PG&E's generation rate has increased since 2009 while renewable supply costs have fallen by nearly 75% over the same timeframe. These cost reductions are the result of dramatic price reductions for solar photovoltaic generation. In addition, the prices for new renewable supply in California are very low because PG&E and the other investor-owned

utilities have excess renewable generation in their portfolios, thereby driving down the demand for new renewable power.

It is important to understand the change in PG&E's generation rate in the context of the changes in the underlying power and fuel markets. PG&E's portfolio consists of nuclear, hydroelectric, natural gas-fired, wind, and solar generation, and other electricity purchases. The cost of natural gas (and, as a result, short-term market purchases of electricity) have fallen significantly over the past 5 years, which has tended to counterbalance the high cost of renewables that PG&E procured to meet its RPS obligations.

It is also important to understand that CleanPowerSF will be entering the market for renewable and non-renewable power supplies at a time of very favorable prices. As seen above, renewable costs have fallen below the weighted-average cost of PG&E's portfolio. Also, both short- and long-term forward power prices are very low relative to historic levels. The following figure presents market data for the forward markets for power delivered in northern California.

Figure 4: Forward Electric Prices in Northern California



Source: Jeff Bush, Noble Americas Energy Solutions (2015).

As the figure shows, not only are 5-year forward prices almost 50% lower than in early 2010, but those 5-year forward prices are comparable to the 1-year forward prices today, meaning that market expectations are that wholesale prices should remain relatively low.

Despite current low market prices, CleanPowerSF plans to develop a portfolio of resources, consisting of short-, intermediate-, and long-term supplies from a range of different supply sources and fuel types, consistent with the policy for power procurement discussed elsewhere.

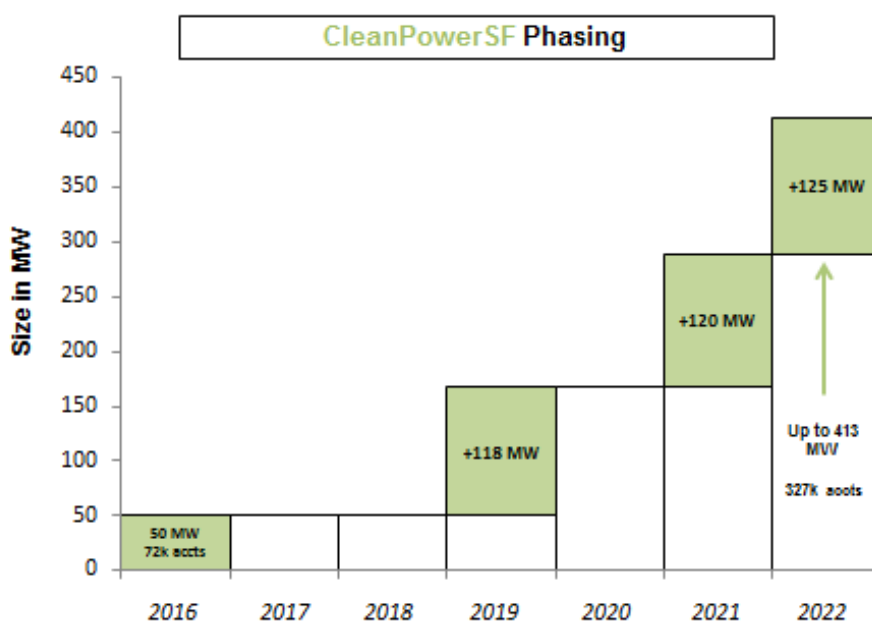
This diversification will allow CleanPowerSF to react to short-term market opportunities but to have the majority of its supply contracted, thereby mitigating to a certain extent market price risk. CleanPowerSF’s proposed procurement practices are discussed below.

B. Phasing Plan

As part of the prudent development and expansion of CleanPowerSF, we plan to phase in customers. This gradual expansion will allow CleanPowerSF to phase in operational and resource procurement. It will also allow CleanPowerSF to make mid-course corrections if necessary in order to successfully reach full build-out.

The following figure presents CleanPowerSF’s initial phasing plan for serving customers.

Figure 5: Phasing Plan for Program Expansion



Source: Pacific Energy Advisors Phasing Analysis December 4, 2015.

From the above figure, it is seen that CleanPowerSF plans to have an initial rollout of 50 MW of load. CleanPowerSF plans to include approximately 75,000 customers in its initial customer group. These customers would consist of both residential and commercial customers. CleanPowerSF has determined that offering service to a mixture of residential and commercial customers will provide the program greater revenue stability (residential customers are less likely to switch providers) and higher operating margins (small and medium commercial customers have higher average rates and more sales per account) than if offering service to either commercial or residential customers alone. In the initial phase, CleanPowerSF will invite any customer within the City to participate by enrolling early. CleanPowerSF will fulfill the balance of its sales target by enrolling customers in the Southeast and Central parts of the City.

CleanPowerSF has set a stretch goal of enrolling sufficient customers into its SuperGreen program to fulfill 5% of CleanPowerSF annual sales (i.e., approximately 2.5 MW of the 50 MW), with the remaining 95% of its annual sales coming from customers receiving the default Green service. CleanPowerSF will have sufficient flexibility in its supply portfolio to handle different opt-out levels and customers' product choices.

For the base case, CleanPowerSF conservatively assumes that 20 percent of the initial tranche of customers will opt-out and continue to take commodity service from PG&E. This is a very conservative estimate and is a higher opt-out rate than Sonoma or Lancaster experienced during their start-ups, but consistent with the average opt-out rate MCE has experienced. The CleanPowerSF phasing plan after the initial tranche assumes a 15% opt-out rate to inform how fast the build-out may occur.

After the first year, CleanPowerSF plans to have more phases and eventually expand to serve the entire city, as shown in Figure 5. This phasing plan assumes that CleanPowerSF meets all of its milestones and internal metrics that are established prior to the roll-out of each phase. These include that CleanPowerSF has:

- The ability to offer rates to customers sufficient to cover program costs and are competitive with PG&E's generation rate less PCIA and franchise fee surcharges;³
- Supply commitments that are sufficient to meet projected load resulting from existing customers plus new customer enrollment;
- Staff and systems and/or qualified third parties that can handle additional volumes and accounts;
- Sufficient and cost-effective sources of credit/collateral and working capital support for incremental growth; and
- Sought and obtained the necessary approvals for rates, supply and service contracts, and financial support.

Only after satisfying these conditions will CleanPowerSF expand its program. As a result of this financially responsible approach, scaling to full implementation is projected to take six years.

C. Base Case Assumptions and *Pro Forma*

CleanPowerSF has developed a base case projection of sources and uses of funds from May 2016 through FYE 2021. This section presents the key assumptions used in this analysis as well as the initial *pro forma* sources and uses chart.

³ Phase 1 would have CPSF rates 0.5% below PG&E's generation rate less PCIA.

1. Assumptions

The following summarizes the key assumptions used in the base case. Most of these assumptions are discussed elsewhere in this business plan in greater detail.

- Demand Assumptions
 - Phase 1 load will equal 30 MW, with load increasing to 50 MW after six months
 - The Phase 1 participants will represent a mix of both residential and commercial customers.
 - 20% of initial tranche of customers will opt-out of CleanPowerSF service and remain with PG&E.
 - 95% of load is enrolled under Green product with remaining 5% under SuperGreen product.
- Supply Assumptions
 - For the first 3 years, for the first 50 MW of CleanPowerSF load, the majority of supply volumes and prices will be fixed.
 - The Green product portfolio will consist of 35% eligible renewables; the SuperGreen product portfolio consists of 100% renewables.
- Operating Assumptions
 - Noble Americas providing back office and customer care functions at the contracted price.
 - CleanPowerSF will fund 10 full-time equivalent employees for its operations.
- Reserves and Repayments
 - Operating Reserves funded at 90 days of expenditures; operating reserve account is fully funded by 2020.
 - Rate Stabilization Reserve funded at 15% of revenues; rate stabilization reserve account will be fully funded after more than 5 years.⁴

⁴ This is a change from initial projections presented to the Commission November 10, 2015, where the rate stabilization reserve was fully funded by year 5. This change is because, on November 5, 2015, PG&E revised its June request of the CPUC (A.15-06-001) to further increase its PCIA rates, and on November 13, a proposed decision was issued granting PG&E's request. The base case now reflects the proposed decision.

- Repay Hetch Hetchy \$8 million working capital contribution by 2021 (i.e., within five years of program launch)
- Rates
 - Rates will be adopted per the San Francisco Charter §VIII.B.125.
 - Phase 1 CleanPowerSF rates will be 0.5% below PG&E's generation rates, less the PCIA and franchise fee charges.

2. CleanPowerSF Base Case Sources and Uses of Funds

Based on the assumptions noted above, CleanPowerSF developed a base case for the sources and uses of funds. The basic income, expenses and contribution to services are summarized in the figure below.

Figure 6: Base Case Sources and Uses

\$s in millions	OPERATIONS					
	FYE 2016 (May-June)	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
SOURCES						
Electricity Sales Revenue	0.3	28.1	33.9	35.0	36.0	37.1
Hetch Hetchy Loan	8.0	-	-	-	-	-
Total Sources	\$ 8.3	\$ 28.1	\$ 33.9	\$ 35.0	\$ 36.0	\$ 37.1
USES						
Energy Supply	1.7	21.2	24.2	25.3	26.4	27.3
Operating Costs	0.8	6.0	6.3	6.5	6.6	7.2
Deposit to Operating Reserve	5.8	0.1	1.3	0.1	0.0	0.0
Reserves and Repayments:						
Contingency/Rate Stabilization Reserve	0.0	0.0	0.0	1.0	0.9	1.1
Hetch Hetchy Loan Repayment	-	0.8	2.0	2.0	2.0	1.3
SuperGreen Programs/Projects	0.0	0.1	0.1	0.1	0.1	0.1
Add'l Reserve for Growth, Discounts, Etc.	-	-	-	-	-	-
Total Uses	\$ 8.3	\$ 28.1	\$ 33.9	\$ 35.0	\$ 36.0	\$ 37.1
RESERVE BALANCES (CUMULATIVE)						
Operating Reserve	5.8	5.9	7.3	7.3	7.3	7.3
Contingency/Rate Stabilization Reserve	0.0	0.0	0.0	1.0	1.9	3.0

The Sources and Uses figure shows the Operating Reserve target of 90 days of working capital fully funded at the completion of the programs' third full operating year with a remaining 6.5% of operating margin available for other accounts. The margin generated from Super Green customers is dedicated for SuperGreen programs and projects. The remaining operating margin was prioritized to first repay the \$8 million Hetch Hetchy Loan for working capital contribution within 5 years, then begin to fund the Rate Stabilization Reserve to 15% of revenue, with any remaining funds available to fund other activities. The Rate Stabilization Reserve is not fully funded in the 5 year target.

On November 5, 2015, PG&E revised its June request of the CPUC (A.15-06-001) to further increase its PCIA rates, and on November 13, a proposed decision was issued granting PG&E's request. The base case reflects the proposed decision. With PG&E's latest proposal to increase

PCIA rates, the base case shows we are not able to fully fund the Rate Stabilization Reserve within the initial 5 years.

D. Sensitivities

In order to identify potential financial risks, the discipline of Enterprise Wide Risk Management was employed, and a sensitivity study was conducted in which the five variables with the greatest risk ratings were identified and tested. These are:

- The residential-commercial customer class mix: How does having more or less of either class affect CleanPowerSF? Sensitivities were calculated for load increases of 5% in one class accompanied by a 5% decrease in the other class.
- The opt-out rate: what fraction of the potential CleanPowerSF customers will choose to remain with PG&E service? The opt-out rate was increased and decreased by 10 percentage points around the base case value (20% \pm 10%)
- Changes to PG&E's Generation Rates: PG&E's rates might differ from that predicted in the pro forma. To evaluate this, PG&E's generation rates were increased and decreased by 10% so as to identify the impact on revenue to CleanPowerSF. (This is assuming that CleanPowerSF's rates are maintained to be competitive with PG&E's.)
- Supply Portfolio Management Strategy: Sensitivities were conducted to ascertain the financial impact of market prices increasing or decreasing by 10%.
- Renewable Content: The sensitivity to the renewable content in CleanPowerSF's portfolio was also explored by increasing the base renewable content by 5% or decreasing it by 2%.

Table 3 shows the results of the sensitivity analyses in terms of the average annual net impact in dollars and as a percent of revenue. The impact of most of the variables tested was relatively minimal; less than \$800,000 annually or a 2.8% reduction or increase in revenue. The exception to this is the sensitivity to PG&E's generation rates. Here, a 10% change could result in an impact of \$4,500,000, or over 15% of revenue. However, it must be noted that this sensitivity assumes that PG&E's rates are changing independent of CleanPowerSF's power costs. Since CleanPowerSF and PG&E will be participating in the same wholesale markets, this is not necessarily likely to occur. On the other hand, if CleanPowerSF is highly hedged (i.e., most of its generation costs are fully locked-in) and PG&E is refunding a large over collection (or making up for a large under collection) from the prior year, a \pm 10% impact is not impossible, especially given the accompanying effect of the PCIA.

Table 3. Sensitivity Analyses

Sensitivity Factor	Change from Base Case	Avg Annual Net Impact	% of Revenue
Opt-Out	Opt-out rate decrease by 10%	+ \$0.8M	+ 2.8%
	Opt-out rate increase by 10%	- \$0.8M	- 2.8%
Customer Mix	Commercial load increases by 5%, Residential decrease by 5%	+ \$0.1M	+ 0.4%
	Commercial load decreases by 5%, Residential increase by 5%	- \$0.1M	- 0.4%
PG&E Rate Change (No Change in Cost)	Rate increase by 10%	+ \$4.5M	+ 15.8%
	Rate decrease by 10%	- \$4.5M	- 15.8%
Supply Portfolio Hedging Strategy	25% open position market prices decrease by 10%	+ \$0.5M	+ 1.7%
	25% open position market prices increase by 10%	- \$0.5M	- 1.7%
Renewable Content	Base product renewable content decrease by 2%	+ \$0.2M	+ 0.7%
	Base product renewable content increase by 5%	- \$0.5M	- 1.7%

E. Risk Management

1. Risks to Affordability

A primary goal is to offer power to San Francisco residents and businesses at an affordable and competitive price relative to PG&E. In this circumstance, affordability is tied to the rate offered by PG&E. A number of factors can cause CleanPowerSF customers' net power costs to exceed PG&E rates. CleanPowerSF will have in place risk management plans and options to both mitigate these risks as well as to address unexpected risk.

Changes to PG&E Generation Rates: There could be circumstances that result in PG&E's generation rates being less than CleanPowerSF's, particularly if CleanPowerSF is setting its rates to recover its cost of service. Assuming that PG&E's rates are based on PG&E's cost of service, CleanPowerSF obviously has little or no ability to influence the rates that PG&E offers.

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

Changes to PG&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. In order to maintain bundled customer rates, the CPUC has instituted an exit fee, known as the “Power Charge Indifference Adjustment” or “PCIA” that is charged to all CCA customers. The PCIA is intended to ensure that generation costs incurred by PG&E before a customer transitions to CCA service are not shifted to remaining PG&E bundled service customers.

Thus, for a customer taking CleanPowerSF service to be economically better off (i.e., pay less for electricity), the sum of the CleanPowerSF charges plus the PCIA must be lower than PG&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 and fairly allocated to CleanPowerSF customers, it will be necessary for CleanPowerSF to monitor and possibly actively participate in the regulatory proceedings in which the CPUC sets the PCIA.

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

Mitigation: First, CleanPowerSF will manage its supply portfolio so 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 CleanPowerSF’s average costs exceeding PG&E’s generation rates less the PCIA, CleanPowerSF will endeavor to reduce rates (to the extent feasible and prudent given existing reserves) such that CleanPowerSF’s prices will remain competitive with PG&E.⁵

Changes to Customer Base: Customers may choose to opt-out of CleanPowerSF service when their Phase is implemented, or in fact at any time.

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, without having to either dump power at a loss or purchase excessive amounts at high spot market prices.

2. Risks to Cleaner Alternatives

A second goal of CleanPowerSF is to provide cleaner power alternatives to San Francisco 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 affordability goal. This could occur if a greater-than-expected number of

⁵ The Rate Stabilization Reserve, intended to help smooth potential rate increases or offer rate discounts to stay competitive with PG&E, will not be available to mitigate the effects of cost increases, as discussed above.

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

Mitigation: These risks can be minimized by contracting with only experienced, creditworthy, reputable developers of renewable energy, and by prudent portfolio management. In addition, CleanPowerSF will limit the number of customers that can participate in SuperGreen to the amount of renewable energy available to serve the program. If it turns out that there is greater than 5% demand, CleanPowerSF will establish a waiting list for the program and enroll additional customers only when sufficient renewable energy supply has been secured.

3. Risks to Local Projects and Jobs

A third goal is for CleanPowerSF to meet its renewable goals, 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. As noted in the report by the Civil Grand Jury, San Francisco and the general Bay Area is highly developed, with minimal land available for utility-scale renewable generation. Furthermore, local projects will tend to be more costly than remote ones, and even then require 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. Second, CleanPowerSF can work with other City agencies to identify locations that could hold megawatt-scale solar arrays. Third, CleanPowerSF 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.

4. Risks to Financial Stability

CleanPowerSF must be financially stable. This is necessary to ensure that CleanPowerSF can adapt to changing market conditions for any unhedged supplies or to have a rainy-day fund available to help offset costs that would otherwise lead to bills that exceed those from PG&E. Financial stability and a prudent reserve will support obtaining a credit rating, which in turn should reduce the costs of purchasing supply and facilitate efficient funding of owned generation.

Mitigation: CleanPowerSF will implement supply management protocols to contain the costs of non-power supplies; manage power market exposure, supplier exposure, and load uncertainty by prudent hedging and power portfolio management. In addition, CleanPowerSF will implement cost-containment strategies when building or contracting for higher-cost local projects. Third, CleanPowerSF will match short-term and long-term revenues and costs (i.e., pay for short-term costs with long-term revenue streams). Last, CleanPowerSF will prudently set rates so as to generate a reserve fund to cover unexpected costs or changes to PG&E rates that would impact the comparability of CleanPowerSF's rates and customer bills.

5. Other Risks

Regulatory Risk. PG&E's rates are set by the CPUC. The CPUC acts in response to legislative mandates and market forces. PG&E actively participates in proceedings before the CPUC.

CleanPowerSF's competitive position relative to PG&E is based in part on rates and charges set by the CPUC.

Mitigation: In order to keep abreast of PG&E activities at the CPUC and legislature, CleanPowerSF will need to diligently participate in important proceedings at the CPUC and at the state legislature. Such activities can help "level the playing field" between CleanPowerSF and PG&E as well as attempt to minimize the chance that adverse CPUC decisions or legislation could harm CleanPowerSF's competitive position.

Ability to Execute Efficiently at Larger Scale. The proposed phasing for CleanPowerSF is contingent upon satisfying financial stability requirements prior to expansion and calls for adding one-third of the remaining potential customer base in 2019, another third in 2021, and the rest of the potential customer base in 2022. Put differently, CleanPowerSF's peak load would grow to over 400 MW and it would be serving over 300,000 accounts in six years.⁶ This also means that at full expansion CleanPowerSF would be four times the size of the SFPUC's current power requirement. Such rapid growth could stress systems and staff.

Mitigation: Expansion of CleanPowerSF will occur only if management is assured that the staffing, systems, and platforms are robust enough to scale to the next level. Well-defined metrics and milestones must be met prior to incremental expansion. In addition, market conditions will need to be favorable to ensure a low-cost supply to serve the incremental customers.

IV. Operations

A. Organization and Management

The organizational structure of CleanPowerSF is determined by the requirements of State law, the San Francisco City Charter, and applicable City ordinances. The key entities with a role related to CleanPowerSF are: (1) the San Francisco Board of Supervisors, which established the City's CCA program by ordinance in May 2004 (Ord. 86-04) and provides broad policy direction for the program; (2) the SFPUC, which manages and controls CleanPowerSF; (3) the San Francisco Local Agency Formation Commission, which advises the Board of Supervisors and the SFPUC regarding various aspects of CleanPowerSF; and (4) the Rate Fairness Board, which advises the SFPUC regarding CCA program rates. A general description of the roles and operating procedures of these entities is shown in the Table below and the sections that follow.

⁶ For comparison, Marin Clean Energy expanded to 180 MW over 5 years.

Table 4: Expected Operating Procedures

Function	Start-Up	Near-Term	Long-Term
Program Governance	SFPUC & Board of Sup.	SFPUC & Board of Sup.	SFPUC & Board of Sup.
Program Monitoring	SFLAFCO	SFLAFCO	SFLAFCO
Program Management	SFPUC	SFPUC	SFPUC
Outreach/Marketing	SFPUC (with LAFCO and SFE)	SFPUC (with LAFCO and SFE)	SFPUC (with LAFCO and SFE)
Customer Service	Noble	Noble	SFPUC (3 rd party support)
Key Account Management	SFPUC	SFPUC	SFPUC
Regulatory	SFPUC	SFPUC	SFPUC
Legal	City Attorney	City Attorney	City Attorney
Finance	SFPUC	SFPUC	SFPUC
Rate development	SFPUC (with Rate Fairness Board)	SFPUC (with Rate Fairness Board)	SFPUC (with Rate Fairness Board)
Resource Planning	SFPUC (3 rd party support)	SFPUC (3 rd party support)	SFPUC (3 rd party support)
Energy Efficiency	SFPUC (with SFE)	SFPUC (with SFE)	SFPUC (with SFE)
Resource Development	SFPUC	SFPUC	SFPUC
Portfolio Management	SFPUC (3 rd party support)	SFPUC (3 rd party support)	SFPUC (3 rd party support)
Scheduling Coordinator	3 rd Party	3 rd Party	3 rd Party
Data Management	Noble (contractor)	Noble	SFPUC (3 rd party support)

1. San Francisco Board of Supervisors

The Board of Supervisors is the legislative branch of the City. The Board consists of eleven full-time members elected by district, who may serve up to two successive four-year terms. Regular Board meetings are held weekly (except for holidays) and are subject to the public meeting requirements of California's Brown Act and the San Francisco Administrative Code. In addition, the Board has several standing Committees that hold regular public meetings. The Mayor may approve or veto legislation approved by the Board.

The Board may override a mayoral veto by a vote of not less than two-thirds of the members of the Board.

In addition to establishing the City's CCA program and providing general policy guidance for the program, the Board's responsibilities related to CleanPowerSF include reviewing rates set by the SFPUC (Charter Sec. 8b.125) and reviewing certain contracts that the City Charter requires to be approved by the Board (Charter Sec. 9.118).

2. San Francisco Public Utilities Commission

Pursuant to the San Francisco Charter, the SFPUC is responsible for the management and control of CleanPowerSF. Headquartered at 525 Golden Gate Avenue in San Francisco, the SFPUC has approximately 2,300 employees with a combined annual operating budget of approximately \$700 million.

The SFPUC is comprised of three separate enterprises: Water, Wastewater, and Power. The Water Enterprise is responsible for managing the transmission, treatment, storage and distribution of potable water to San Francisco's wholesale and retail customers, and operates the Hetch Hetchy Water and Power project. The Project is San Francisco's primary source of potable water and hydroelectric generation, and is funded by Water Enterprise and Power Enterprise ratepayers. The Wastewater Enterprise is responsible for managing the collection, treatment and disposal of San Francisco's storm water and wastewater. The Power Enterprise is responsible for managing electric energy for San Francisco municipal customers, including: retail power sales, transmission and power scheduling, energy efficiency programs, street lighting services, utilities planning for redevelopment projects, energy resource planning efforts and various other energy services.

As a division of the Power Enterprise, the CleanPowerSF program is under the direct administrative oversight of its Assistant General Manager, who in turn reports to the SFPUC General Manager. The program will be funded by CleanPowerSF ratepayers.

The SFPUC is overseen by a Commission consisting of five members appointed by the Mayor to four-year terms, subject to confirmation by the Board of Supervisors. Each Commissioner fills a designated seat on the Commission based on particular qualifications: Seat 1 requires experience in environmental policy and an understanding of environmental justice issues; Seat 2 requires experience in ratepayer or consumer advocacy; Seat 3 requires experience in project finance; Seat 4 requires expertise in water systems, power systems, or public utility management; Seat 5 is an at-large member (Charter Sec. 4.112(b)). The Commission holds regular meetings twice monthly that are subject to the public meeting requirements of California's Brown Act and the San Francisco Administrative Code. Subject to the overall policy direction given by the Board of Supervisors, the Commission's duties include evaluation and approval of key policies and goals related to the development, implementation, and operation of CleanPowerSF. The Commission is responsible for reviewing and approving the contracts recommended by SFPUC staff with third-party suppliers of electricity and other services for CleanPowerSF.

The Commission will also approve rates for CleanPowerSF services, subject to rejection by the Board of Supervisors. The Commission will recommend the program budget for inclusion in the Mayor's budget, which is then considered by the Board of Supervisors.

3. Local Agency Formation Commission

The San Francisco Local Agency Formation Commission (LAFCO) was created pursuant to California Government Code Sections 56000 *et seq.* LAFCO consists of two members from the Board of Supervisors representing the County of San Francisco, two members appointed by the Board of Supervisors to represent the City of San Francisco, and a fifth member representing the

general public. LAFCO holds regular monthly meetings that are subject to the public meeting requirements of California's Brown Act and the San Francisco Administrative Code.

In June 2007, the Board of Supervisors formally asked LAFCO to monitor the implementation process and advise the SFPUC and the Board of Supervisors regarding the development, implementation, operation and management of the CCA program (Ordinance 146-07).

4. Rate Fairness Board

In accordance with Charter Section 8B.125, the Rate Fairness Board (RFB) advises the Commission regarding the setting of rates for the public utility services under the jurisdiction of the SFPUC. The RFB consists of seven members, including three designated City officials, two City residential retail customers and two City business retail customers. The RFB's duties include making recommendations to the SFPUC Commission on utility rates, holding public hearings on rate recommendations, and reviewing five-year rate forecasts. The RFB's hearings and meetings are subject to the public meeting requirements of California's Brown Act and the San Francisco Administrative Code.

B. Supply

Power supply costs are projected to be approximately 70% of the operating costs of CleanPowerSF. As such, understanding and controlling these costs is critical to the success of CleanPowerSF.

CleanPowerSF will leverage the experience of SFPUC with regards to power supply acquisition, portfolio management, and risk management. Having this in-house experience provides CleanPowerSF a major leg up on other potential CCAs. The Major functions associated with the acquisition and management of CleanPowerSF's supply portfolio that will be performed by CleanPowerSF staff are summarized below.

1. Approach

CleanPowerSF's general approach for supply management will be to diversify its supply portfolio across suppliers, technologies, project size and location, price terms, and tenor. This diversified procurement strategy will result in relatively fixed pricing for CleanPowerSF's customers over the short- and intermediate term. Such a portfolio structure is consistent with the stated preferences of customers, who generally are averse to price volatility, even if prices are slightly higher on an expected value basis.

The first step in constructing the supply portfolio is the development of a set of guidelines for procurement. These guidelines will include requirements for counterparty credit quality and proven track record, firm rules for resource/technology and supplier diversification, and plan review requirements. For Phase 1, these guidelines were embedded in the request for offer for power supplies published by the Commission.⁷ CleanPowerSF will establish and obtain further

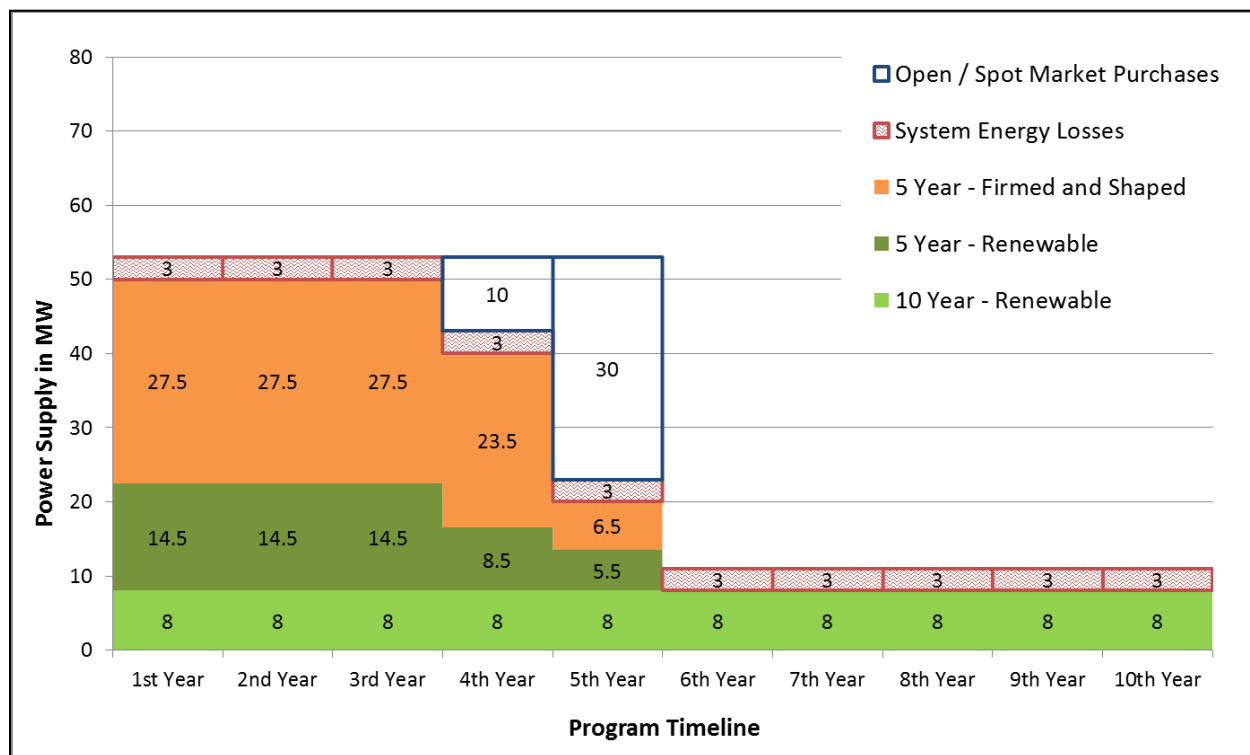
⁷ See Request for Offers Agreement No. CS-1032, Community Choice Aggregation Power Supplies, August 11, 2015.

approval for the guidelines in advance of the go-live date for the program. Risk limits and reporting requirements for CleanPowerSF's mid- and long-term purchases will be developed to ensure that those transactions comport with the guidelines established by CleanPowerSF. Also, Power Enterprise will amend its Energy Trading Risk Management Policy to incorporate the CleanPowerSF program, including risk reporting mechanisms such that CleanPowerSF management will be apprised of risk within the portfolio.

Having established and received approvals for the procurement guidelines and risk tolerances, CleanPowerSF will make purchases consistent with these guidelines and limitations. Mid- and long-term purchases will occur through formal Requests for Offer (RFOs).⁸ Short-term purchases will occur on a bilateral basis consistent with the SFPUC Power Enterprise's existing guidelines and authorities.

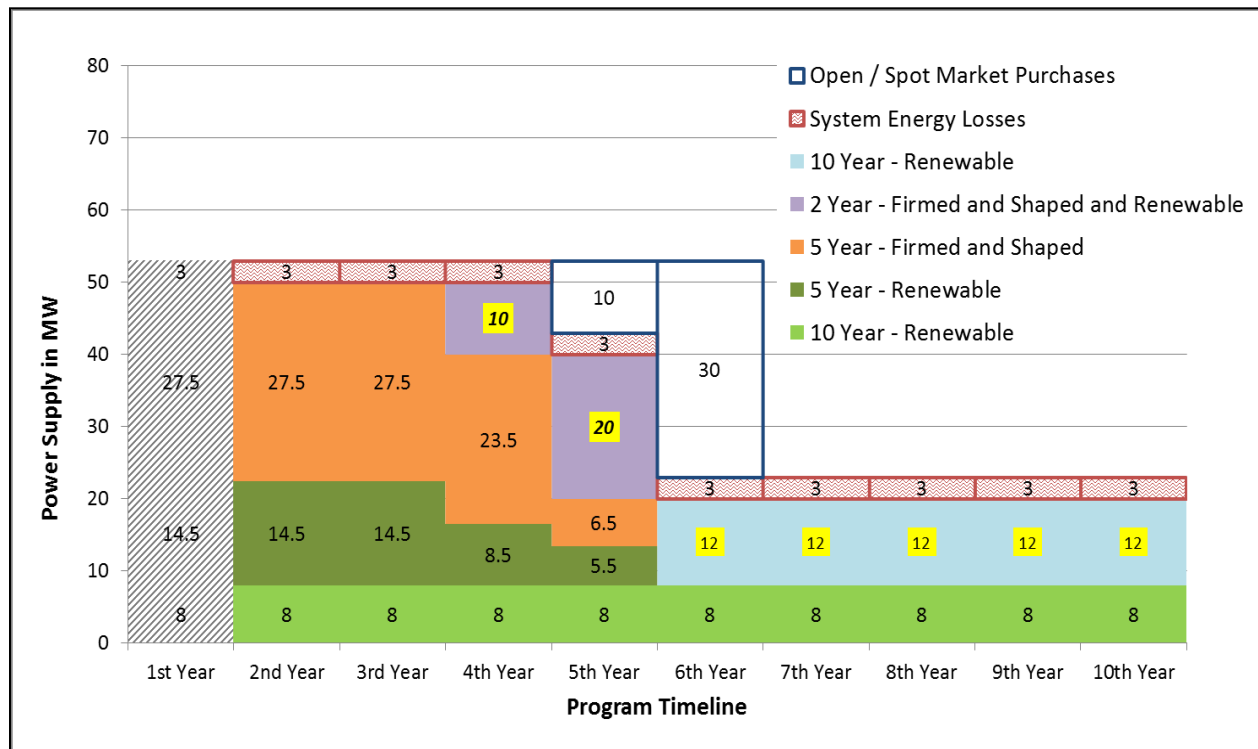
The following figures present a stylized portfolio structure for the first two years of operation for CleanPowerSF (for the initial 50 MW tranche of load).

Figure 7: Stylized Portfolio of Resources (Year 1)



⁸ CleanPowerSF could also decide to develop a project on City-controlled land. Under this approach, CleanPowerSF would likely competitively solicit via an RFP for a design-build contractor. A feed-in tariff program with set price and standard contract terms will also be developed, but likely for relatively small projects.

Figure 8: Stylized Capacity Addition (Year 2)



These two figures stylistically present several key concepts as relates to CleanPowerSF's procurement approach:

- A variety of tenors for contracts: 2, 5, and 10 years;
- A variety of supply options: as-delivered and firm and shaped;
- A variety of fuel sources: renewable and all-sources;
- A variety of pricing structures: fixed price, indexed price, and tolls;
- A limited spot market purchase exposure, with the exposure remaining 4 years out from the prompt year, thereby allowing CleanPowerSF to take advantage of favorable market opportunities;
- A movement toward longer-term purchases: in year 2, ladder in an additional 12 MW of long-term renewables to reduce open position in years 6-10; and
- A reduced reliance on all-source resources over time, consistent with an increased need for renewables to meet RPS requirements.

These figures do not depict other important aspects to CleanPowerSF's portfolio: geographical diversity, size diversity, reliance on Hetchy supply when not adverse to POU ratepayers, and technology diversity within the renewable supply plan. The figures also do not address how

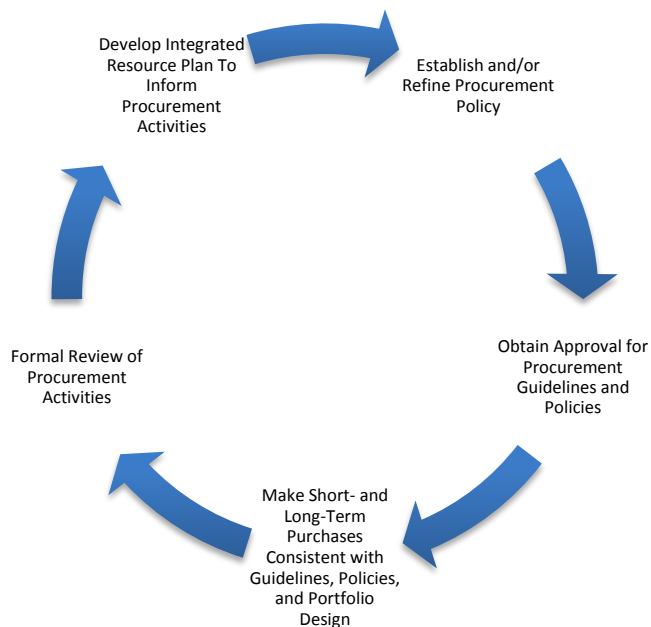
demand-side resources such as energy efficiency, demand-response, feed-in tariff generation, and behind-the-meter renewables such as Net Energy Metering resources would be included in the resource mix.

In order to demonstrate the performance of the portfolio, CleanPowerSF will establish a formal review process of past procurement decisions. This review process will consist of reviews on a monthly, quarterly, and annual basis. The purpose of such a review is to provide information for CleanPowerSF's power procurement team for process improvement. This information will also be very useful for the key annual procurement planning exercise: CleanPowerSF's Integrated Resource Plan (IRP) process.

The annual IRP process requires CleanPowerSF to describe in a highly structured and comprehensible manner its current and future supply options and demand requirements, the key uncertainties and risks facing the enterprise, and any suggested changes to pre-established procurement guidelines. The IRP will be presented to management for discussion and approval. After approval, the IRP will serve as the guiding document for procurement over the following year.

The following figure presents a stylized representation of CleanPowerSF's procurement program.

Figure 9: Resource Planning and Procurement Process



2. Product Content Policy

CleanPowerSF's portfolio will consist of renewable and non-renewable resources. The Product Content Policy defines the source and fuel type for different elements of CleanPowerSF's supply portfolio.

There are a number of constraints that CleanPowerSF must meet as a load-serving entity. These include RPS product requirements and Resource Adequacy requirements. CleanPowerSF must demonstrate its compliance with these requirements via filings with the CPUC and other regulatory bodies.

Aside from the requirements established by state law and regulations, CleanPowerSF will establish certain self-imposed constraints on its supplies. These choices reflect the preferences of its customers and the need to provide energy supplies that have a carbon intensity less than that forecasted by PG&E.

Finally, CleanPowerSF will make certain commitments and disclose to its customers the contents of its supply.

The following sections describe the elements of CleanPowerSF's Product Content Policy.

a) Renewable Resources

In order to meet its RPS requirements, CleanPowerSF must procure specific quantities and types of renewable resources pursuant to SB 2 and SB 350. The following table summarizes these requirements:

Table 5: Summary of California's RPS Requirements

Timeframe	% of Retail Load Served by Eligible Renewables	Minimum PCC1	Maximum PCC3	Maximum PCC2 and PCC3
Compliance Period 2 (2013-2016)	21%-25%	65%	15%	35%
Compliance Period 3 (2017-2020)	25%-33%	75%	10%	25%
Compliance Period 4 (2021-2025)	33%-40%	75%	10%	25%
Compliance Period 5 (2025-2027)	40%-45%	75%	10%	25%
Compliance Period 6 (2027-2030)	45%-50%	75%	10%	25%

To meet the preferences of its customers, CleanPowerSF plans to provide renewable energy using renewable energy generated and/or delivered directly into California (i.e., Product Content Category (PCC) 1 resources); it will not procure unbundled RECs (i.e., PCC3). Such an approach

will ensure compliance with the RPS mandate assuming that CleanPowerSF meets or exceeds its minimum RPS requirements.

b) Non-Renewable Generation

In order to meet the needs of its customers at the lowest possible costs, CleanPowerSF plans to meet a portion of its supply requirements through non-renewable sources. However, CleanPowerSF will limit its purchases of non-renewable generation to energy generated using natural gas and large hydro; CleanPowerSF will not purchase power directly from nuclear or coal-fired generators. CleanPowerSF can procure system power as needed.

c) Geographical Preferences

Bundled renewables can be purchased from sources delivered to the CAISO grid. While CleanPowerSF will acquire sources from various locations, it will have a preference for local or regional sources (i.e., generated within the 9 Bay Area counties). As discussed more fully below, this preference for local resources includes a strong preference for developing local projects of different types in San Francisco.

d) Renewable Content Commitments to Customers

CleanPowerSF will initially offer two products: Green and SuperGreen. The SuperGreen product will contain 100% eligible renewable energy. The Green product will contain between 33% - 50% of eligible renewable energy. For Phase 1, CleanPowerSF plans to have the Green product contain 35% of eligible renewables, with the remainder of the Green product being sourced from other resource types as discussed above.

While CleanPowerSF will meet its Renewable Content Commitments to customers for the Green product, CleanPowerSF also plans to exceed those commitments if possible. CleanPowerSF will obtain greater levels of renewables as market opportunities present themselves. However, such opportunistic improvements will only be undertaken if CleanPowerSF is able to obtain incremental renewable supplies and remain within the current rate outlook. In other words, CleanPowerSF will attempt to increase the renewable portion of its portfolio consistent with the goals of affordability, financial stability, and development of local projects.

3. Local projects

CleanPowerSF will pursue local supply and load reduction projects. CleanPowerSF will test the market for such resources on a regular basis through regular, standardized procurement activities with a stated preference for local projects. CleanPowerSF will procure such resources if they fit within the resource portfolio and meet affordability, risk, and other metrics. Such projects will provide employment and economic activity to San Francisco and the Bay Area.

a) Local/Regional Supply Resources

There are a wide variety of local/regional supply options available to CleanPowerSF. These include both wholesale resources as well as behind-the-meter resources. Wholesale projects

include projects located on City-owned or controlled property and Feed-in Tariff (FiT) programs. Behind-the-meter projects include renewables developed pursuant to Net Energy Metering (NEM) tariffs and/or GoSolarSF⁹ incentives. The following table summarizes CleanPowerSF's plans for these resources:

Table 6: CleanPowerSF's Plans for Net Metering and FiT

Service	CleanPowerSF Customers Eligible?	CleanPowerSF Action
Net Energy Metering	Yes. PG&E provides T&D and CleanPowerSF receives generation from customers	CleanPowerSF to propose NEM, including net surplus generation rate, in Spring 2016 for launch
Self Generation Incentives	Yes	GoSolarSF funds available in addition to PG&E rebates.

To access the FiT or NEM resources, CleanPowerSF will need to develop policies, rules, and tariffs for these programs. Policy issues could include ownership of RECs from NEM projects, renewable resources eligible for participation, and size limits. CleanPowerSF will also establish an initial limit on total capacity procured from these resources in order to ensure that there is not an excess supply or unacceptable upward pressure on rates.

b) Local / Regional Demand-Side Resources

CleanPowerSF has options for reducing its customer loads and peak demands, which would reduce its need for supply resources. As a CCA, CleanPowerSF is eligible to receive energy efficiency funds that would have otherwise gone to PG&E. CleanPowerSF customers are also eligible to participate in PG&E's energy efficiency programs, for which they will continue to contribute as PG&E ratepayers. As a result, CleanPowerSF will focus initially on helping its customers utilize existing PG&E-ratepayer funded programs. After start-up, CleanPowerSF will then work to expand the menu of demand-side resource options available to its customers, starting with locally-responsive energy efficiency and demand response pilot programs.¹⁰ The following table summarizes CleanPowerSF's expected activities.

⁹ GoSolarSF is the rooftop solar incentive and workforce development program that SFPUC funds and operates; any San Francisco resident and business is eligible to receive GoSolarSF incentives. See <http://sfwater.org/index.aspx?page=133>.

¹⁰ The City has Local Government Partnership programs. Initially, CleanPowerSF expects that those programs would be kept in place. CleanPowerSF also plans to apply to the CPUC to administer funds directly. This could result in CleanPowerSF participating in Local Government Partnership programs as well as other programs since there will be both CCA customers and PG&E customers in SF.

Table 7: CleanPowerSF's Planned Activities for Energy Efficiency, Demand Response and Other Programs

Service	CleanPowerSF Customers Eligible?	CleanPowerSF Action
Energy Efficiency	Yes. May access all PG&E programs.	Plan to develop additional programs tailored to CleanPowerSF customer base; apply to CPUC for energy efficiency funds
Demand Response	Yes. In addition, CleanPowerSF to develop its own generation-funded programs	Will ensure PG&E Demand Response programs provide full value, where CleanPowerSF customers eligible
Low-Income Rates	Yes.	No action needed.
Balanced Payment Plan	Yes (for PG&E charges) No (for CleanPowerSF charges at start)	Plan to create companion balanced payment program for generation component (target date: Fall 2016)

For additional information about these and other programs, please see Appendix 2.

c) Key Steps and Risk Mitigation

CleanPowerSF plans to leverage existing programs whenever possible to provide local programs. For example, CleanPowerSF would encourage customers to participate in programs offered by PG&E and other programs funded by the City. In order to ensure customers will be eligible for PG&E programs, CleanPowerSF will need to advocate at the CPUC to ensure that CleanPowerSF customers can participate in PG&E's self-generation, energy efficiency, demand response, low income, and balanced payment plans. If necessary, CleanPowerSF will develop comparable, more locally-responsive services.

CleanPowerSF plans to develop and/or fund its proposed NEM, FiT, and GoSolarSF programs. As discussed above, it will be necessary for CleanPowerSF to establish rules and tariffs for some of these programs.

While these local programs appear promising, CleanPowerSF will pursue them only to the degree that they meet affordability, financial needs, and renewable content enhancement goals¹¹. In addition, CleanPowerSF will also establish spending limits to mitigate risk of high costs and/or project failure.

4. Local Jobs projections

The formation and activities related to CleanPowerSF will create local jobs. These jobs consist of staffing for CleanPowerSF, both City employment and through third party service providers, and jobs directly related to development of new renewable and demand-side resources.

CleanPowerSF expects to directly create and fund 10 full-time equivalent (FTE) positions at the SFPUC to manage and operate the first phase of the CleanPowerSF program. These jobs include program management and administration; contract management; power purchasing; forecasting and scheduling; local program development; outreach and communications; and regulatory advocacy and compliance.

The estimated FTEs associated with Phase 1 of the CleanPowerSF program are summarized in Table 8 below.

¹¹ Renewable content enhancement refers to the fact that when CleanPowerSF has margin, it will be able to choose how to spend it – apply margin to rate decreases, to reserves, to buying more renewables to bring the target 35% up to an “enhanced” level.

Table 8: CleanPowerSF Phase 1 Positions and Functions

Positions	Functions	FTEs
CleanPowerSF Program Director (1) Management Assistant (1) Utility Specialists (2) Utility Analysts (2)	<ul style="list-style-type: none"> ▪ Program Management, Budgeting and Oversight ▪ Power Supply and Service Contract Management ▪ Key Account Management ▪ Regulatory ▪ Integrated Resource Planning ▪ Complimentary Program Development and Administration (e.g., energy efficiency; net metering; feed-in tariff) 	6
Communications Manager (0.75) Outreach Coordinator (1) Public Relations Officer (0.75)	Outreach, Marketing and Communications	2.5
Senior Power Generation Technician (1)	Power Purchasing, Scheduling and Portfolio Management Support	1
Utility Specialist (0.5)	Energy Data Systems Support	0.5
Utility Specialist (0.5)	CAISO Settlements	0.5
TOTAL		10.0

Aside from the direct creation of jobs related to the management and administration of CleanPowerSF, there will also be local jobs created as a result of the operations of program call center activities and the future development and operation of local renewable energy supply and/or demand-side management programs. Noble Americas, the SFPUC's partner for data management and customer care services, expects one new local FTE will be created to support CleanPowerSF's Phase 1 call center functions in San Francisco, with more jobs created potentially as the program grows. Table 9 shows our projected job creation from procurement of supply and development of renewable and demand side management programs.

Table 9: CleanPowerSF Phase 1 Job Creation

Job Type	Job-years¹² Created
Local and regional construction from new renewables ¹³	167
CleanPowerSF role as energy efficiency administrator	3
Energy efficiency implementation jobs from direct CleanPowerSF funding	28
Energy efficiency implementation jobs from customer leveraged funding ¹⁴	84
TOTAL	282

C. Rate Setting

CleanPowerSF will set rates to fully recover the costs of operations, debt service and to fund reserve accounts. The rate setting will comport with existing policies in the Charter¹⁵ as well as with the current SFPUC Rate Policy.

Consistent with existing rate setting policies, CleanPowerSF will set rates as required by the Charter. These rates will “provide sufficient resources for the continued financial health” of the enterprise. Rates will also be “based on cost of service.”

CleanPowerSF will also set rates consistent with SFPUC Rate Policy. Key policy considerations include affordability, compliance, sufficiency, and transparency. Consistent with these requirements, CleanPowerSF’s rate setting process will be open and transparent to the public.

In addition to meeting the requirements and goals of the existing rate policies, CleanPowerSF will also establish additional rate setting policies that are consistent with the needs of CleanPowerSF and its customers. Specifically, CleanPowerSF will minimize rate volatility. CleanPowerSF will endeavor to review rates once per year in the spring and make adjustments if

¹² Job-years refers to the number of jobs created by an investment or activity for the duration of one year.

¹³ This projection assumes that approximately 5% of CleanPowerSF’s Phase 1 annual energy requirements are, over time, supplied by local/regional solar projects (about \$31 million of local and regional solar investment and about 5 construction job-years created per million dollars invested). See EnerNex Report (2015): <http://www.sfbos.org/Modules/ShowDocument.aspx?documentid=50676>

¹⁴ Assumes that as a program implementer CleanPowerSF receives approximately \$500,000 per year in energy efficiency funding in Phase 1 and that energy efficiency expenditures create approximately 7 job-years per million dollars invested. As an energy efficiency program administrator, CleanPowerSF estimates that \$4 million per year in funding will generate approximately 28 direct jobs-years and about 112 leveraged job-years (i.e., from customer energy efficiency investments). See EnerNex Report (2015): <http://www.sfbos.org/Modules/ShowDocument.aspx?documentid=50676>

¹⁵ See SF Charter Section 8B.125:
http://library.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:sanfrancisco_ca

needed. As is the SFPUC practice, the CleanPowerSF program will report typical customer bill impacts during the rate setting process. See Appendix 1.

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

D. Back-office Services

CleanPowerSF has contracted with Noble Americas to manage and perform “back office” and customer care functions. Noble Americas will provide comprehensive customer care, account management, billing, and data services for CleanPowerSF, including: (1) management of CleanPowerSF customer accounts and billing; (2) exchange of customer usage, billing and payment data with PG&E; (3) timely response to CleanPowerSF customer service calls; and (4) handling of CleanPowerSF customer service issues. This will include initial and ongoing CleanPowerSF customer enrollment, administering billing, data management, and staffing and managing the CleanPowerSF Call Center.

Noble Americas is currently providing these services to all three of the existing California CCAs: Marin Clean Energy, Sonoma Clean Power and Lancaster Choice Energy.

E. Service Offerings and Comparison with PG&E

CleanPowerSF has performed a detailed review of various additional services provided by PG&E and the availability of these services and comparable service provisions to cover any gaps for customers who opt-in to CleanPowerSF. See Appendix 2 for more details.

F. Other Activities

1. Regulatory Advocacy

Activities at the major regulatory bodies as well as the legislature can impact virtually all aspects of CleanPowerSF’s operations.

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

In addition, there are numerous proceedings at the CPUC that can directly or indirectly affect CleanPowerSF, such as PG&E procurement and rate setting proceedings or Commission Rulemaking proceedings that address the exit fees CCA customers must pay. CleanPowerSF 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 Francisco. CleanPowerSF 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 greenhouse gas reporting and operates the state's Cap and Trade Program. Thus, the CleanPowerSF 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 collect various data (e.g., sales, distributed PV) from all the load-serving entities for forecasting and setting state energy policy. Further, the CEC implements the state's Power Content Disclosure requirements, and the CleanPowerSF staff must report to the CEC in compliance with those requirements annually.

2. Legal

CleanPowerSF will utilize the San Francisco Office of the City Attorney (City Attorney) as legal counsel to advise regarding administration of CleanPowerSF; 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 CleanPowerSF.

V. Financial Structure and Management

CleanPowerSF will be a financially-independent entity with separate and defined ratepayers. Such financial separation is required under the Power Enterprise bond indenture. The SFPUC will establish reserve funds for CleanPowerSF commensurate with the working capital, operating reserves, and contingency requirements of the program. To do so, CleanPowerSF shall develop a rate design that recovers sufficient revenue to adequately fund these reserves in the intermediate term. As a program of the SFPUC, CleanPowerSF will be able to leverage the expertise and systems of the SFPUC and the Power Enterprise in order to reduce overhead costs. Another way that CleanPowerSF will control costs is to use contractors and/or SFPUC staff as appropriate and cost-effective.

A. Financial Structure

CleanPowerSF was established as a financially separate program within the Power Enterprise. Pursuant to the Power Enterprise bond indenture,¹⁶ CleanPowerSF must be financially separate

¹⁶ See "TRUST INDENTURE By and Between PUBLIC UTILITIES COMMISSION OF THE CITY AND COUNTY OF SAN FRANCISCO and U.S. BANK NATIONAL ASSOCIATION, as Trustee Dated as of May 1, 2015, Article VII, Section 7.1." This section of the Trust Indenture reads in relevant part:

Maintenance of Existence and Powers. The SFPUC shall at all times maintain its existence as a separate department of the City and the existence of the Power Enterprise as a separate utility of the SFPUC formed under the authority of the Charter, and shall at all times use its best efforts to maintain all the powers of the SFPUC and of the Power Enterprise as a separate utility of the SFPUC. The SFPUC shall undertake any City-wide retail electric power program as a Separate System.

from the Power Enterprise. This means the revenues, expenses, assets and liabilities of CleanPowerSF must remain separate from the rest of the Power Enterprise and SFPUC. As a result, the Power Enterprise's bondholder pledge excludes CleanPowerSF revenues and expenditures.

In order to maintain the required separation, CleanPowerSF will be established in a separate fund for financial management/reporting purposes. This will allow for separate tracking of CleanPowerSF's revenues and expenditures and the production of an annual audited financial statement that clearly identifies CleanPowerSF activities. By maintaining a clear separation of finances and assets, CleanPowerSF will eventually be able to establish its own credit rating.

Even though it is financially independent, the Power Enterprise will provide limited financial backing to support an effective launch of CleanPowerSF.

B. Power Enterprise Support

CleanPowerSF needs financial backing in order to start up. This financial backing includes a line of credit, working capital, and operating reserves. The Power Enterprise will provide this limited financial support. The following table summarizes the nature of the financial support being provided by the Power Enterprise.

Table 10: Financial Support Being Provided to CleanPowerSF by Power Enterprise

	Working Capital and Operating Reserves	Letter of Credit
Purpose	Start-up working capital loan	To secure certain CleanPowerSF power contract obligations
Amount	Up to \$8 million	Up to \$40 million facility with JP Morgan
Tenor of Obligation	Up to 5 years after launch of CleanPowerSF	Up to 5 years, with ability to extend an additional 5 years
Priority for Power Enterprise	One-time loan	The repayment of any draw is subordinate to all other Power Enterprise expenditures
CleanPowerSF Obligation	Repayment of principal and interest to Power Enterprise	Payment of all annual fees and repayment of all power enterprise obligations

In this way the Power Enterprise provides start-up financial support to CleanPowerSF without posing undue risk to its credit rating and funding requirements. If CleanPowerSF were fail or to face a pending draw on the Letter of Credit, there are a number of strategies to mitigate the impact on the Power Enterprise and its ratepayers. These mitigations could include re-negotiating extended contract terms with power providers, incorporating all or a portion of the

remaining CleanPowerSF supply contracts to serve its Power Enterprise load obligations, defer non-essential capital projects.

C. Reserve Policy

CleanPowerSF has a policy related to establishing reserves to support its operations. Staff is proposing the establishment of two reserve funds:

- An Operating Reserve with target level funding equal to 90 days of operating expenditures
- A Contingency/Rate Stabilization Reserve with target level funding equal to 15% annual revenues

There are three 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. Third, a prudent reserve policy is critical to establishing an investment grade credit rating, particularly for a low-margin undertaking such as a CCA which unlike a public power enterprise is exposed to a range of competitive risks.

While funding the reserves may slow the pace of enrollment and some local projects and programs in the near-term, these reserves will ultimately lower costs to consumers because it will allow CleanPowerSF to build the track record required to establish a credit rating, which would allow CleanPowerSF to achieve its other objectives..

It is important to note that CleanPowerSF'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 11: Expected Financing Requirements

Financial Need	Target	Phase 1	Full Program
Operating Reserve/Working Capital Needs	90 days' expenses	\$4-\$7 million	\$54 million
Rate Stabilization Reserves	15% of annual revenues	\$6 million	\$44 million
Credit/Collateral to Support Supply Commitments	Sufficient to support fixed-price supply commitments for 3-5 years	\$20-\$30 million	\$140-\$240 million
Total Financing Needs		\$30-\$43 million	\$240-\$340 million

CleanPowerSF's financial requirements for a full scale program are around eight times greater than Phase 1 requirements. Thus, the establishment of these reserves will need to continue for several years after program launch before reaching the necessary levels for build-out. CleanPowerSF will only build-out additional phases if the operating cash and working capital reserves are funded.

D. Organization and Responsibilities

The CleanPowerSF Program Director will be responsible for managing the financial affairs of CleanPowerSF, including developing the annual budgets and revenue requirements, managing and maintaining cash flow requirements, arranging potential bridge loans and other financial tools, arranging financing for capital projects and preparing financial reports, and managing a large volume of billing settlements. Financial management will also include risk management functions, including establishing credit policies and monitoring the credit of suppliers, as well as ensuring that revenues from customers will only be used for CleanPowerSF activities, and will not be used to fund other City programs.

Management of CleanPowerSF's financial affairs will utilize the experience and financial management systems of the SFPUC Financial Services Department. The Financial Services Department provides the financial services for the SFPUC's three utility enterprises and supporting bureaus. The Financial Services Department's functions include developing and maintaining long-range capital and financial plans, and support for financial accounting and reporting, accounts payable, billing and collection of water, wastewater, and power charges, and other revenues.

The CleanPowerSF Program Director will use contractors and/or SFPUC staff in support of these activities, as appropriate.

VI. Execution

A. Overview

Based upon the policies and structures described above, CleanPowerSF 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

CleanPowerSF recommends the following structure regarding governance of the enterprise:

Table 12: Governance Structure for CleanPowerSF

Function	Responsible Entity	Role
Overall Guidance	<ul style="list-style-type: none">• Mayor• Board of Supervisors• SFPUC Commissioners	<ul style="list-style-type: none">• Broad oversight• Policy Adoption• Contract Approval
Strategic Direction	<ul style="list-style-type: none">• SFPUC Executive Management	<ul style="list-style-type: none">• Policy Recommendations• Prioritization of Efforts
Execution of Strategic Direction and Plan	<ul style="list-style-type: none">• CleanPowerSF Director and Staff• Business Services, External Affairs, and Communications Support	<ul style="list-style-type: none">• Policy Analysis and Development• Implementation of Plans• Reporting and Metric Evaluation• Customer Outreach and Education
Controls	<ul style="list-style-type: none">• Business Services	<ul style="list-style-type: none">• Adhere to Power, Business Services, and City-wide Procedures and Reporting Requirements• External Audits

CleanPowerSF's operations will follow from the broad policy directions established by the Mayor, Board of Supervisors, and the SFPUC Commissioners. SFPUC Executive Management will propose strategy to the General Manager and also provide strategic direction to CleanPowerSF. There will be significant levels of controls outside of CleanPowerSF, including external audits as well as review of performance to ensure that CleanPowerSF meets City-wide procedures and reporting requirements for an operation of this magnitude.

B. Performance Reporting Policy and Metrics

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

Table 13: Recommended Performance Reporting Policy and Metrics

Performance Area	Metric
Renewable Energy Content	<ul style="list-style-type: none">• % of supply from renewable energy by resource type• Location of projects supplying energy
Local Energy Production and Savings	<ul style="list-style-type: none">• Amount of energy produced (and saved) locally (MWh)• Amount of capacity and energy supplied behind-the-meter (MW and MWh)
Environmental Benefits	<ul style="list-style-type: none">• GHG content of energy supplied (lbs/MWh)• Citywide GHGs reduced (lbs CO₂e)
Economic and Social Benefits	<ul style="list-style-type: none">• Direct and indirect jobs created (# of job-years)• Customer bill savings (incl. energy efficiency and net metering) (\$ and % saved)
Financial Metrics	<ul style="list-style-type: none">• Progress towards reserves balance targets• Debt coverage ratio

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

APPENDIX 1

BILL COMPARISON EXAMPLES

FOR RESIDENTIAL AND COMMERCIAL CUSTOMERS

An example report of CleanPowerSF's currently projected retail prices against PG&E's comparable rate tariffs' current prices has been included below.

Table 14: Bill Comparison for Typical Residential Non-CARE Customers

Example Monthly Residential Electric Charges	PG&E	CPSF Green	CPSF SuperGreen
	27% Renewable Energy	35% Renewable Energy	100% Renewable Energy
PG&E Electricity Delivery (all customers)	\$ 28.11	\$ 28.11	\$ 28.11
Electric Generation (all customers)	\$ 28.52	\$ 21.02	27.16
Additional PG&E Fees (CPSF customers only)	n/a	\$ 7.36	\$ 7.36
Average Total Cost	\$ 56.63	\$ 56.49	\$ 62.63

Table 15: Bill Comparison for Typical Residential CARE Customers

Example Monthly Residential Electric Charges	PG&E	CPSF Green	CPSF SuperGreen
	27% Renewable Energy	35% Renewable Energy	100% Renewable Energy
PG&E Electricity Delivery (all customers)	\$ 9.17	\$ 9.17	\$ 9.17
Electric Generation (all customers)	\$ 28.52	\$ 21.02	27.16
Additional PG&E Fees (CPSF customers only)	n/a	\$ 7.36	\$ 7.36
Average Total Cost	\$ 37.69	\$ 37.55	\$ 43.69

A typical residential customer energy usage of 307 kWh was used to compute the bills above. The typical usage amount was based off of San Francisco 2013 load data from PG&E Item 16 Customer Data. Source for the PG&E rate is 2016 AET filing for summer baseline quantity, except the PCIA which was determined from the Nov 5, 2015 ERRA filing.

Table 16: Bill Comparison for Typical Small Commercial Customer

Example Monthly Small Commercial Electric Charges	PG&E	CPSF Green	CPSF SuperGreen
	27% Renewable Energy	35% Renewable Energy	100% Renewable Energy
PG&E Electricity Delivery (all customers)	\$ 210.75	\$ 210.75	\$ 210.75
Electric Generation (all customers)	\$ 196.46	\$ 164.82	\$ 189.56
Additional PG&E Fees (CPSF customers only)	n/a	\$ 30.65	\$ 30.65
Average Total Cost	\$ 407.21	\$ 406.23	\$ 430.96

A typical A-1 commercial customer energy usage of 1649 kWh was used to compute the bill above. The typical usage amount was based off of San Francisco 2013 load data from PG&E Item 16 Customer Data. Source for the PG&E rate is 2016 AET filing for summer rate, except the PCIA which was determined from the Nov 5, 2015 ERRA filing.

APPENDIX 2

COMPARISON OF SERVICE OFFERINGS WITH PG&E

Program Type	Program Description	Availability to CCA Customers	Plan to Ensure Service for CleanPowerSF Customers
Assistance Programs	<p>The assistance programs PG&E provides its customers include</p> <ul style="list-style-type: none"> - California Alternative Rates for Energy (CARE) program - Family Rate Assistance Program (FERA) (Federal Program) - Medical Baseline - Energy Savings Assistance Program - Relief for Energy Assistance through Community Help (REACH) - Low Income Home Energy Assistance Program (LIHEAP – Federal Program) - Payment Arrangements 	Yes - All of these assistance programs will continue to be offered to CleanPowerSF customers.	No additional action is necessary for CleanPowerSF, including on the CARE and FERA programs which are bill discounts that will continue to be offered at the same rate.
Balanced Payment Plan (BPP)	PG&E averages enrolled customers' annual energy costs over the previous 12 months to determine a more consistent, levelized monthly payment amount. The utility will adjust the monthly amount once every four months if the actual energy usage has significantly changed.	Partial – At launch only the PG&E charges will continue to be billed at a levelized BPP rate for enrolled customers.	CleanPowerSF will develop a Balanced Payment Plan program to restore the complete program. CleanPowerSF will communicate to customers that this will be delayed and will not auto enroll BPP customers until the program is developed.
Energy Efficiency	Available to PG&E customers is a statewide pool of ratepayer funds that incent real, additional, and achievable energy savings and reductions without reduced levels of productivity or output (energy efficiency).	Yes – Additionally, CleanPowerSF will apply for additional statewide energy efficiency funds to be provided for our customers.	Will file an application at the California Public Utilities Commission to access additional statewide energy efficiency funds for CleanPowerSF customers.

Program Type	Program Description	Availability to CCA Customers	Plan to Ensure Service for CleanPowerSF Customers
Demand Response (DR)	A program that compensates end-use customers for reducing their electricity use (load), when requested by a utility, especially during periods of high power prices or when the reliability of the grid is threatened.	Yes – Most DR programs will continue to be available to CleanPowerSF customers. Exception – Peak Day Pricing and SmartRate are not offered to CleanPowerSF customers.	CleanPowerSF may develop additional DR programs to offer CleanPowerSF customers. Additionally, we will consider offering programs similar to the Peak Day Pricing and SmartRate programs.
Generation Incentives	The generation incentive programs PG&E offers include <ul style="list-style-type: none"> a. Self-Generation Incentive Program (SGIP) b. Single/Multi-family Affordable Solar Homes (MASH/SASH) c. Solar Hot Water Heating d. New Solar Homes Partnership (~\$59 Million remaining) 	Yes – these generation incentives will continue to be offered to CleanPowerSF customers.	Additional GoSolarSF funds will continue to be made available to all San Francisco residents, including CleanPowerSF customers.
Net Energy Metering (NEM)	Qualifying distributed generation power exporters can offset their electricity usage costs with the power they export to the grid.	Yes – CleanPowerSF will have NEM rates available at launch.	CleanPowerSF will wait to auto enroll NEM customers to ensure a smooth transition with the PG&E imposed true-up periods.

Program Type	Program Description	Availability to CCA Customers	Plan to Ensure Service for CleanPowerSF Customers
Electric Vehicle Programs	Current PG&E customers are able to utilize special time-of-use rates that allow for discounted charging at night when the grid is least stressed. Additionally, customers may install an additional meter with a special EV rate design so as not to impact the tiers of the other home electricity usage	Yes - CleanPowerSF will match PG&E's electric vehicle rates, providing the same service. Additionally, customers may continue to have a second EV specific meter installed.	No additional action is necessary
Smart Meter and Data	Smart Meter system collects electric usage data for more precise and efficient management of the grid and energy usage by both PG&E and the customer. It allows the customer to view detailed usage information anytime online and allow PG&E to read meters without physically accessing the meter and interrupting power schedules.	Yes – Smart meter functionality will continue to be made available to CleanPowerSF customers. Additionally, smart meter opt-out will be out of the control of CleanPowerSF.	No additional action is necessary.
Energy Usage Alerts	PG&E will deliver automatic alerts to enrolled customers when moving into higher-priced electric tiers so customers can better manage energy use and costs.	Yes - If customer has SmartMeter installed and is on tiered rate schedule.	No additional action is necessary.
Special Rate Designs	PG&E offers a number of special rate designs like time-of-use rates.	Yes – CleanPowerSF will develop a corresponding rate design for all of the available PG&E rate programs.	No additional action is necessary.

Program Type	Program Description	Availability to CCA Customers	Plan to Ensure Service for CleanPowerSF Customers
Green Tariff/ Community Solar Option	This service provides expanded access to renewable energy to customers by allowing them to either: 1) subscribe 50% or 100% of their energy from a pool of small and mid-sized solar projects, or 2) make a separate agreement from a solar developer to purchase power directly.	No – Will not be available to CleanPowerSF customers.	CleanPowerSF is providing the SuperGreen service in place of the Green Tariff Option.
Energy Storage	Some customers have chosen to install personal storage solutions like the Tesla Power Wall. These customers interconnect their storage system under the PG&E Rule 21.	Yes- CleanPowerSF customers may continue to utilize personal energy storage solutions.	No additional action is necessary.
Mobile Home Park Master Meter Upgrade	Qualifying mobile home parks or manufactured housing communities will be eligible for an upgrade in meters and distribution systems for more safe and reliable energy delivery.	Yes - If enrolled in time for current pilot program.	No additional action is necessary.
Climate Smart Program	Customers who enroll in Climate Smart contribute a monthly, tax-deductible donation based on their actual energy usage that fund projects in California that reduce or absorb greenhouse gases.	Yes – CleanPowerSF customers may continue to participate in the Climate Smart program.	No additional action is necessary.

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