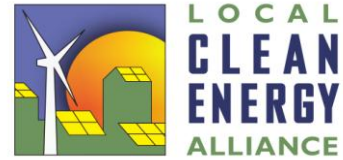


Proposed Business Plan: CleanPowerSF Build-out of Local Renewable Energy Resources



Based on Local Power, Inc. preliminary financial model and implementation scenarios and other documents prepared for the SFPUC and the CleanPowerSF Technical Review Committee.

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Introduction

This short paper describes the main features of the preliminary business plan proposed by Local Power, Inc. (LPI) for the build-out of local renewable energy resources, a central component of San Francisco's CleanPowerSF energy program. The paper also summarizes the programmatic and financial implications of preliminary scenarios associated with this business plan.

The business plan indicates the power of a comprehensive approach to system-wide planning. Preliminary results showed that CleanPowerSF, under the proposed LPI business plan, could provide electricity at rates lower than PG&E and could achieve a greater than 28% local renewables target within ten years.

Background

In October 2012, LPI—under contract with the San Francisco Public Utilities Commission (SFPUC) to design a local build-out implementation plan for the CleanPowerSF energy program—delivered a preliminary financial model for assessing the financial mechanisms and outcomes of various development scenarios within a proposed CleanPowerSF business plan.

The financial model shows the investments required, revenues generated, jobs created, and Local Portfolio Standard achieved by the build-out of a suite of energy resources developed over a ten-year timeframe. The outcomes depend upon the specific development scenario: the mix of energy resources, the pace of development, the assumed costs and pricing, and so forth.

The financial model does not include a rate design component. It uses PG&E's current rates as a baseline against which to measure customer rate and bill impacts. It assumes the impacts of the business plan are spread across all rate classes as a percentage of PG&E rates. Also, the financial model assumes PG&E annual rate increases based on the Northern California Power Agency's 6th annual forecast of PG&E rates.

LPI was to finalize the financial model and the associated business plan based on refined assumptions and targets, site surveys, and the inclusion of additional renewable technologies. That work, however, remains uncompleted.

Features of the Business Plan

The LPI business plan consists of the following integrated features, which together represent a robust, comprehensive approach to the build-out of local renewable energy resources through the CleanPowerSF energy program:

1. **Service Delivery:** The plan represents an energy services delivery program—providing demand reduction and onsite generation services to customers and program ownership investment opportunities—rather than an energy procurement and sale program of merely buying electricity for ratepayers.
2. **Integrated Energy Resources:** The plan represents a highly integrated mix of local renewable energy resources (at this stage including energy efficiency, combined heat and power, and solar PV, with other technologies such as solar thermal, demand response and energy storage to be added in the final plan). All of these resources combine to reshape the overall electricity demand load, displace traditional wholesale energy purchases, optimize energy system design, and increase the program’s economic viability.
3. **Robust Build-out:** Build-out of in-city renewable energy assets (such as installing energy efficiency and new generating capacity) and nearby regional assets (such as wind or geothermal generating capacity) commences as soon as possible after program launch. The objective is to achieve a high Local Portfolio Standard (the portion of energy supplied by in-city and nearby regional assets) in relatively few years. In the preliminary business plan, no additional in-city build-out of new generating capacity is assumed after 2017, but additional installation of energy efficiency is continued. The site selection process (to have been completed this year) would determine the actual rate of deployment of assets by technology and customer class.
4. **Customer Phase-in:** Projected customer enrollment will progress over approximately 4 years to all customer classes; residential and non-residential. Customer enrollment is assumed to take place in phases after the initial program launch in the first year (using Shell contracted energy): 33% served in year 2, 66% served in year 3, and 100% served in year 4. An opt-out rate of 20% is assumed for the enrollments over this 4 year period.
5. **Market Purchase Component:** The build-out of in-city renewable energy assets and the inclusion of nearby large-scale regional renewable assets, by themselves, do not provide sufficient energy to satisfy the relatively rapid customer enrollment process. This requires CleanPowerSF to purchase electricity and/or renewable energy certificates (RECs) on the market (in addition to an initial Shell contract purchase) while local renewable energy assets are being built.
 - a. *Revenue Needed for Build-out:* Customer bill payments under the rapid customer phase-in process (facilitated by market-purchased electricity) provide a revenue stream needed for rapid investment in new renewable energy assets. CleanPowerSF program payments to service the debt for such assets cannot exceed a certain percentage (the Debt Service Capacity Ratio) of the overall program revenue. Hence rapid customer phase-in is necessary for revenue to increase apace with building new assets. The amount of energy that has to be purchased on the market increases the complexity and cost of energy procurement and therefore needs to be minimized.

- b. *Competitive Challenge*: In particular, because it may prove difficult to purchase power on the market at rates that are competitive with PG&E for any extended period of time, the plan prioritizes the timely build-out of cost-competitive local assets. Given the volatility of the natural gas market, it is a challenge for CleanPowerSF's market purchased portfolio of fossil-fuel power, renewables, and RECs to compete with PG&E's portfolio, which includes relatively inexpensive large hydro and nuclear sources.
 - c. *REC Purchase*: LPI's business plan outlines a market purchase option that immediately provides 100% "green" power to CleanPowerSF customers by using California Renewable Portfolio Standard (RPS)-compliant RECs. This will establish a program which will better compete with PG&E's own 100% "green" customer offer proposed for later this year.
 - d. *Optimization*: LPI models the costs of electricity market purchases and revenues from sales on an hourly basis to account for projected patterns of renewable generation and energy demand, the variability of fossil-fuel power pricing, and the patterns of demand at increasing stages of customer enrollment. This methodology allows CleanPowerSF to estimate the financial impact of assets that either passively or actively modify the City's overall peak electricity load shape. In so doing, CleanPowerSF can lower the cost of service by minimizing power purchases during periods of peak load pricing, and by lowering requirements for monthly electricity resource adequacy.
- 6. Core Build-out Component:** The core of the business plan is to leverage extensive installation of behind-the-meter assets (not measured by meter readings) as a crucial source of revenue and energy savings. This can provide all CleanPowerSF customers with a competitive cost of service within a few short years: that is, electricity bills that are competitive with PG&E bills (bill parity) and potentially lower than PG&E bills.
- a. *Value Proposition*: The value of behind-the-meter assets is that there is no transmission or distribution charge for the electricity they generate (or conserve). In the LPI plan, CleanPowerSF finances behind-the-meter assets which are paid off through power purchase and energy savings sharing agreements with customers. These agreements reduce the customers' bills while allowing CleanPowerSF to capture a portion of the transmission and distribution savings. This is already the established practice of successful energy service companies (ESCOs), solar PV developers, PACE commercial programs, and so forth.
 - b. *Contracting Structures*: The eventual contracting structures used by CleanPowerSF could include ownership of new assets by customers or by third parties, with the program acting as a city-wide project manager to ensure performance, coordinate the build-out and market purchase of electricity, and leverage economies of scale.
 - c. *Siting*: In the LPI plan, behind-the-meter generating assets, owned by CleanPowerSF, customers, and third-party energy service companies, and financed with revenue bonds and/or private financing, are built on non-residential (commercial and industrial) properties. Behind-the-meter demand-side (demand reduction) assets are built on both residential and non-residential properties. An intended siting analysis would determine whether there are residential properties large enough and with steady enough load usage profiles to warrant the siting of specific generating assets on those properties as well (especially via collective residential properties such as condominiums or neighborhood improvement districts).

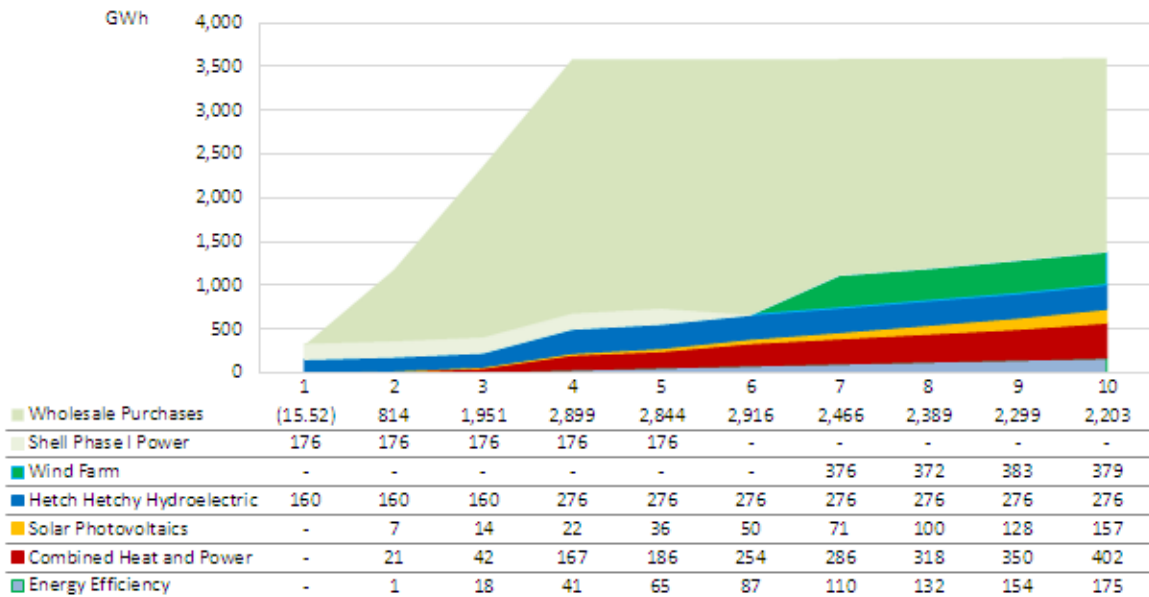
- d. *Competitive Advantage:* CleanPowerSF has a competitive advantage over ESCOs or other third-party developers for building behind-the-meter assets based on the following circumstances:
- CleanPowerSF has access to all customer meter data and can select the most profitable targets for installation of energy assets.
 - For a private sector energy company delivering onsite generation or efficiency services, the benefits are only the avoided costs that the customer would have paid for electricity absent the installed assets. However, for the CleanPowerSF program, every kilowatt-hour saved has multiple financial benefits, of which the customer's avoided retail rate is just one. By lowering demand, the program also avoids costs of market purchases, peak usage charges, scheduling coordinator costs, and so forth. In other words the program should be able to offer a better deal than private companies can because CleanPowerSF is financially benefitting in a number of ways that private providers cannot. CleanPowerSF is also a non-profit entity and also can benefit from city-wide economies of scale.
 - Small and medium sized commercial customers rarely invest directly in energy services and have not proved attractive to ESCOs, and therefore represent a relatively large market of customers which the CleanPowerSF program can attract, especially by providing special bonuses for sites that participate in the build-out program (see the next item).
7. **Community Shares:** The plan provides for a community shares component (Own Your Power) in which customers gain shares of total CleanPowerSF assets by virtue of paying their utility bills, and can therefore have a share in the financial benefits created by the program. CleanPowerSF can achieve lower cost of service even while providing dividends on community share investments. Customers that assist the program in installing renewables and efficiency (on their properties) and/or agree to higher on bill financing charges (opting up), will receive a higher proportion of shares. Customers who opt-out of the CleanPowerSF program, however, will forfeit their shares.

Preliminary Scenario Results

LPI ran a dozen scenarios through the preliminary financial model to assess various CleanPowerSF roll-out strategies. Model runs were designed to give stakeholders and decision-makers insight into the quantitative impacts of various program design decisions currently under discussion.

These scenarios include slower *vs* faster deployment of in-city assets, use of nearby geothermal electricity generation, use of excess Hetch Hetchy power (of varying amounts and at different prices), purchase of unbundled RECs to achieve a 100% renewable portfolio standard, and so forth.

The most recent scenario, included in a March 2013 presentation to the San Francisco Department of the Environment (and one that does not include geothermal), is shown below. The graph illustrates different resources being phased in over a ten year time period.



1. **Financing:** Almost all scenarios require a approximately \$1.0 billion in revenue bond financing over ten years.

PROJECT FINANCING (\$MM)											
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Solar Photovoltaics	\$-	\$ 16	\$ 16	\$ 16	\$ 33	\$ 34	\$ 51	\$ 70	\$ 71	\$ 72	
Wind	\$-	\$-	\$-	\$-	\$-	\$-	\$356	\$-	\$ 10	\$-	
Combined Heat and Power	\$-	\$ 8	\$ 9	\$ 9	\$ 9	\$ 20	\$ 14	\$ 14	\$ 15	\$ 24	
District Heat and Power	\$-	\$-	\$-	\$ 41	\$-	\$-	\$-	\$-	\$-	\$-	
Energy Efficiency	\$-	\$ 1	\$ 9	\$ 13	\$ 14	\$ 14	\$ 15	\$ 16	\$ 16	\$ 16	
Site Acquisition Start-Up	\$ 4	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	
Annual Total	\$ 4	\$ 25	\$ 34	\$ 80	\$ 56	\$ 68	\$437	\$100	\$111	\$ 113	
Cumulative Total	\$ 4	\$ 29	\$ 62	\$142	\$198	\$266	\$703	\$803	\$914	\$1,027	

Notes: Color scale indicates lesser (yellow) to greater (green) annual financing by technology.

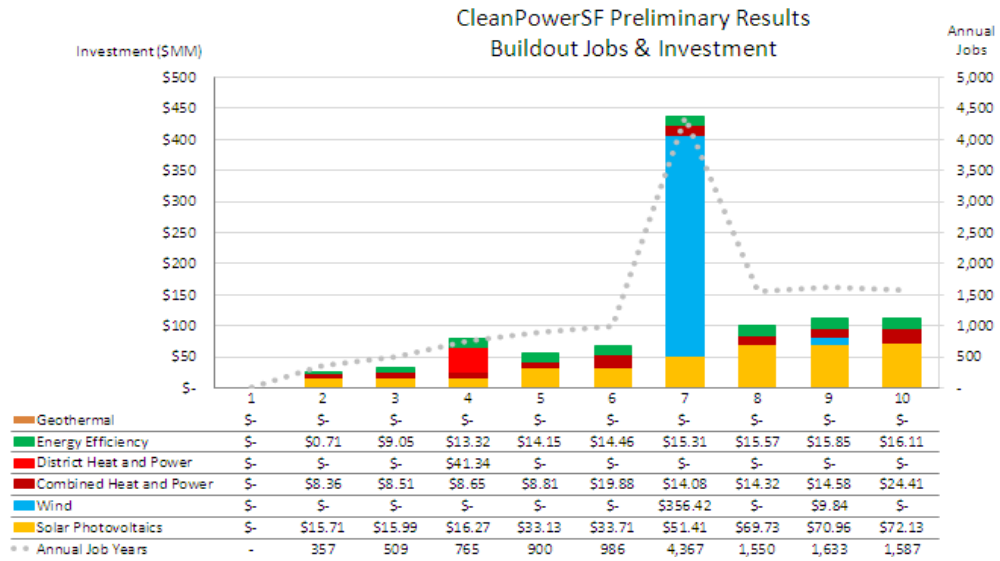
Sparklines on right indicate trend of each line item

2. **Speed of Deployment:** Speeding up deployment of in-city renewable assets and including nearby regional wind and geothermal energy helps CleanPowerSF reach bill parity with PG&E more quickly. Regional wind and geothermal energy are less expensive than 100% renewable grid electricity and can be a hedge against price volatility and against efforts by PG&E to shift its costs from the generating portion of the bill to the distribution portion of the bill (to make it more difficult for Community Choice programs to compete on the generating portion of the bill).

3. **Overall Results:** Preliminary results show the following:

- After the first enrollment phase, no rate premiums compared to PG&E.
- \$610 million in surpluses generated over ten years. This is equivalent to an 18% decrease in electricity generation rates.

- c. About 12,500 job-years of employment created through building local assets during the first five years of the program.



Note: Spike in chart above is due to construction of regional wind facility.

- Initial Launch:** Two factors heavily influence electricity rates in the initial launch of CleanPowerSF:
 - Purchasing low cost unbundled California RPS-compliant RECs to offer a 100% renewable product.
 - Including excess Hetch Hetchy power (currently being sold to other cities through the Western System Power Pool) to enable CleanPowerSF to reach bill parity. To hedge against possible dry seasons, CleanPowerSF can accelerate energy-efficiency installations on City and other local government buildings, thereby ‘freeing up’ more hydroelectric energy to be available to CleanPowerSF.
- Conservative Assumptions:** The LPI energy resource mix at this stage is purposely conservative to demonstrate the viability of the overall business plan. The intention was to enhance the energy resource mix with less conservative energy efficiency targets, more realistic targets for combined heat and power based on site surveys, and by adding in renewable technologies not yet included. All these enhancements are expected to provide for achievement of a 51% or higher local portfolio standard within ten years.