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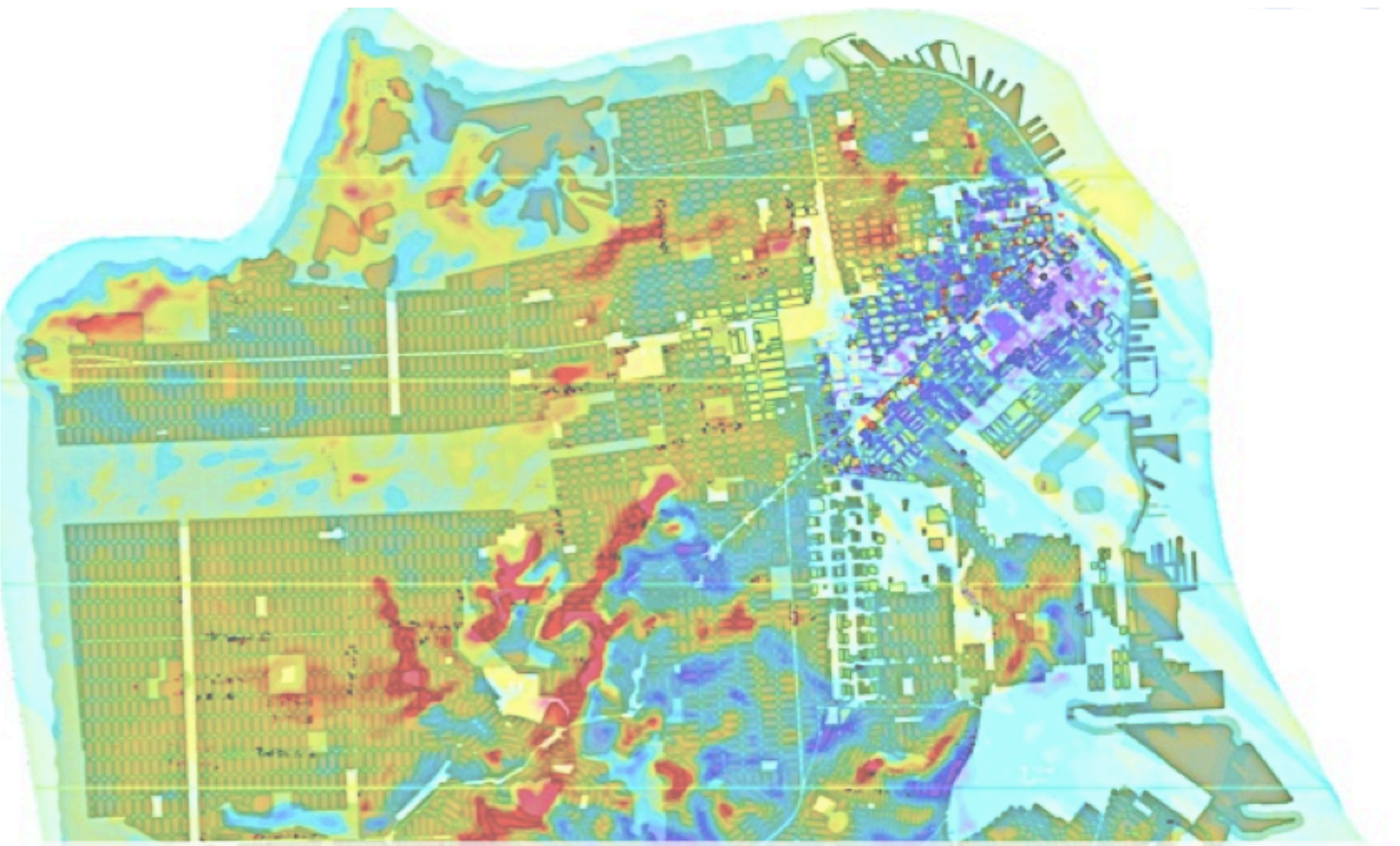

CleanPowerSF

Regulatory & Policy Report

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Cover art: the graphic on this cover was created by Michelle Labbé, using an overlay of C2HM Hill's wind resource map of the City (commissioned by the San Francisco Department of the Environment) on top of GIS datasets of urban bird refuge zones and height and bulk districts. Layout by Katherine Eberle.

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Introduction

CleanPowerSF's deployment goals make it one of the more ambitious clean energy capital infrastructure programs currently under way. Implementing the deployment will be unprecedented in scale and timeline for a local government, whether measured by the value and scale of the infrastructure or by the diversity of renewable energy generation and efficiency technologies included in the deployment.

The program management team will need to effectively address challenges across a number of fronts as the capital asset procurement and deployment phases proceed. Along with the risks associated with the capital deployment elements, the wholesale power options and costs need to be well managed and integrated with the deployment, to avoid compromising the financial effectiveness of the program. Some of the central objectives that will need to be accomplished for the success of the program are:

- Obtaining optimal value-for-money in all of the initial deployment procurement transactions, and keeping capital and operating costs within the cost margins identified in the financial model, so that the returns needed to sustain the project's financing are realized.
- Using effective contracting practices for the deployment to transfer appropriate risk to private sector participants so that exposure to cost overruns is minimized.
- Providing the program management team with sufficient resources and appropriate procedures to ensure that the commercial work required for the effective management of significant installation volumes under multiple contracts is conducted thoroughly and consistently over the course of the implementation phase.
- Effectively managing all regulatory and permit-related requirements, and keeping costs associated with compliance within projected limits.
- Successfully implementing each element of the deployment program in terms of schedule, quality, functionality and durability, and customer and community satisfaction.
- Successfully managing the wholesale power procurement, such that non-deployment generated power costs remain competitive and dispatchable distributed assets are fully integrated into the procurement process.

The purpose of this Risk Report is to identify and evaluate the potential risks that could negatively affect the program. This report begins with a general discussion of the potential role of insurance in the mitigation of CleanPowerSF project risks, and then discusses specific risk topics. For each risk topic, the analyses provided here describe the causes, effects, potential impact, the likelihood of occurrence, and identify available means to prevent or mitigate the risks. Building on the results, the risks can then be anticipated and addressed through changes in technology requirements, or siting approaches, and through contract terms, insurance or proactive management practices.

Use of Insurance

It was determined through our interviews that the SFPUC has a set of established insurance requirements it uses when contracting for renewable energy capital projects. These insurance requirements cover general types of losses and liability, and depending on the nature and scope of a given project, may include: Worker's Compensation, General Liability, Automobile liability, Builder's Risk, and Professional Liability. Broadly speaking, these types of insurance will cover the types of typical risks expected for any larger-scale construction project; losses to property, construction an project-related vehicle accidents, faulty design and damages resulting from poor workmanship. The types of basic insurance required will vary depending on the type of contracts used. For example, contracts that include either ongoing maintenance or operations services in addition to initial project completion will add requirements for appropriate liability and loss coverage during the post-completion phases. The actual insurance requirements for each type of CleanPowerSF RFP are expected to be determined by SFPUC project and risk management staff. The typical project risks that are expected to be addressed through these contractual insurance requirements are not addressed in further detail in this report.

In addition to the basic types of project insurance coverage that will likely be contractually required for each type of CleanPowerSF project, there are specialized insurance programs emerging for renewable energy and efficiency projects. For example, there are insurance companies that provide coverage tailored to the PV installation and usage market, and companies that are offering insurance against failures to provide projected energy savings for efficiency and demand management installations[1]. As a part of the RFP finalization process conducted by SFPUC project and risk management staff, the benefits of requiring any additional specialized coverage will need to be weighed against the quoted costs of the insurance, as it relates to the costs potentially associated with the risk exposures. It should also be recognized that the use of performance based contracting, power purchase agreements, or other contracting approaches that shift risks to the suppliers may encourage suppliers to mitigate their risks by acquiring specialized insurance.

In addition to any basic insurance that may be contractually required by the CleanPowerSF program, there may also be instances where certain types of insurance may be necessary as conditions for the financing, or to improve the appeal of the project from the investment perspective. It is expected that any such additional insurance

[1] For example, Solar Insure, http://www.solarinsure.com, or Energi, http://www.energi.com

coverage requirements associated with the financing process will be identified during the preparation of the project financing arrangements.

Wholesale Power Supply, Scheduling, and Operations

Wholesale Procurement Strategy

The successful management of the wholesale power purchasing process, and the successful coordination and integration of the wholesale power supply with the deployment's effects on demand are important for a number of reasons. As we have indicated in our Customer Phasing reports, providing customers with sufficient, well-priced power options will help avoid high initial opt-out rates, keeping the opt-in eligible customer base from shrinking. If the wholesale purchasing arrangements are not sufficiently flexible to 'track' the combined profile of the renewable generation capacity and demand reduction measures coming on-line over time through the deployment, surplus may have to be sold at unfavorable rates. If the wholesale power purchasing effort is not well managed, (too conservative, to aggressive or inconsistent) there may be rate impacts to customers. If the approach is too conservative, the costs of reducing risk (hedging, etc.) will cause rates to be higher than necessary. If the purchasing approach is too aggressive, there may be instances where high-risk purchasing choices fail, resulting in higher costs for obtaining short-term power to fill the gaps. And similarly, if the wholesale management is inconsistent, the failure to abide by a balanced strategy over time will result in inefficiency, and missed opportunities to obtain power at more favorable cost – again making rates higher than necessary.

Mitigations: Use of a balanced procurement approach that 1) provides for sufficient levels of flexibility to 'track' the deployment's effects on demand, 2) avoids undue risk, and 3) is sufficiently aggressive to take advantage of beneficial market opportunities as they arise. Hedging strategies should be further formulated in close coordination with SFPUC procurement staff and Schedule Coordinator, and reflected in the final Financial Model.

Real-Time Procurement Capabilities

The CleanPowerSF deployment will require the intelligent monitoring and control of distributed generation and demand-side assets, coordinated in real-time and integrated with scheduling activities to lower the overall cost of service. These operations will be vital to the performance of the program overall. Interoperability must be ensured between procurement operations and the assets deployed through the program that are required to be monitored and dispatched. Monitoring wind and cloud cover to forecast the variability of intermittent renewable resources will lessen forecast error and related procurement imbalances.

Mitigations: the SFPUC should expand the scheduling coordinator activities at the Moccasin Powerhouse to take on the responsibility for CleanPowerSF procurement and operational activities. A real-time desk should be created, with a possible backup desk located within the City. Staff have advised that this may require a policy change to reunite power and water operations within the SFPUC, and this should be explored. In the near-term, schedule coordinator services under Shell Energy North America (SENA) should be responsible for integrating these resources, or the SFPUC or its chosen subcontractor should do so for subsequent phases. It should be noted that the Scheduling Coordinator software that SENA has elected to use (supplied by Czarnecki-Yester) does not have the functional capability to integrate DERs into procurement operations. The RFPs for the deployment should include communication specifications allowing for interoperability of dispatchable assets. Forecasting technologies and practices should be assessed in coordination with SFPUC procurement staff and schedule coordinator.

Cost Responsibility Surcharge

The Power Charge Indifference Adjustment (PCIA) is a PG&E surcharge designed such that generation costs incurred on behalf of a customer prior to their enrollment in a CCA are not borne by other PG&E bundled service customers. Cost drivers of the PCIA include natural gas prices, wholesale power prices, and renewable energy costs. The charge is inversely correlated with wholesale power prices, such that if prices go down, the PCIA increases.

Mitigations: SFPUC should continue to intervene in relevant CPUC proceedings to ensure that the PCIA methodology and PG&E's investments into generation assets do not unfairly burden CleanPowerSF customers. The final Financial Model should take into account the relationship between the PCIA and wholesale power costs, so that scenario analyses may be run to estimate the financial risks to CleanPowerSF under various scenarios.

Deployment Implementation

Integrated Project Management

A fundamental objective for the success of the CleanPowerSF program will be the development and execution of a well-planned management approach for the deployment projects. Where traditionally renewables developers are treated at arm's length, under CleanPowerSF the City itself is seeking to build these facilities, and must provide the kind of support and hands-on involvement that City-owned projects receive even when built by contractors. CleanPowerSF will involve many smaller companies implementing separate projects, which will ultimately be financed, controlled and operated by the City as integral components of the community's power supply.

This means that the CleanPowerSF program team will need to be active in parallel across a number of fronts for successful implementation of deployment elements, and the related process requirements. Failures resulting from insufficiently planned and executed management can occur across a wide spectrum of categories, some of which are described specifically in other elements of this report. In general, the exposures include cost overruns, financial mis-management, poor contractor and supplier management, and poor customer relations.

Mitigations: Evaluate the program management functions needed for successful implementation of the program, and plan for and apply the appropriate resources.

Project Portfolio Management

Monitoring the projected online date and progress of each project must be a priority for the program. Doing so will allow cost-containment on a project-specific basis, as problems are identified in real-time and prioritized for resolution, as well as the effective integration of each project into program power procurement and operations.

Mitigations: A single software platform should be used across all technologies and program areas; this is commonly referred to as project portfolio management (PPM) in project-intensive industries. Any off-the-shelf software will need some amount of customization for CleanPowerSF's purposes, but this will not be a significant expense. All program managers, including staff from the procurement department, and subcontractors selected for the deployment will need to use this system; as such, a platform with a web-based user interface should be selected. This database will use as inputs the results from the Site Selection analysis, which will identify key target sites and will pre-populate available site information and technology selections.

Wholesale Procurement Strategies for Deployment Asset Integration

The SFPUC's current contract structure with SENA allows for the substitution of City Assets into wholesale procurement, provided that the City makes SENA whole for any costs incurred through the resale of the displaced wholesale power. Conversely, if wholesale power prices are lower than the price for the contracted power, the City receives the benefit of the energy sold, after making SENA whole for any transactional costs. As the volume of power to be displaced by year 10 of the deployment is currently projected to account for 28% of the City's electricity requirements, this substitution clause exposes CleanPowerSF build projects to significant market price volatility risk.

Mitigations: The wholesale supplier contract should be modified, or a new supplier selected with a contract that allows for a true integration of wholesale planning with the projected online dates of each asset, or the SFPUC should take on Scheduling Coordinator activities in-house and contract for power directly through bilateral contracts with power plants and through purchases on the CAISO markets. The PPM platform will predict the online date for each project, and will modify these timelines as individual projects are brought online sooner or later than initially projected. The City's wholesale procurement of short, medium, and long-term contracts, hedging products, and net short positions to be procured through the CAISO markets should be structured so as to minimize the wholesale procurement costs associated with integrating the deployment.

As a high level point of reference, if every project deployed by CleanPowerSF were to suffer a delay of one month, and the program's wholesale supplier forced to procure the power that should have been supplied by the asset on the DAM, the total cost over the 10 year deployment period would be roughly $4 million. Considering that the net benefit of the deployment is projected at ~$610 million over the same period, the integration of these costs should not be cause for significant concern.

Site Targeting and Acquisition

Deployment timing depends upon the rate of subscription of Anchor sites. Because the program focuses on distributed generation and building retrofits, the sites nearly always involve more than one technology. The draft Financial Model assumes that there is a very positive value proposition to customers (meaning a reduced bill after the deployment installations, and eventual ownership benefits). Inaccuracies in these assumptions, or program implementation which fails to secure Anchor sites subscriptions at the projected rate, will jeopardize the accuracy of the financial projections of the deployment.

Mitigations: As detailed in the Draft Site Selection Criteria, the Site Selection process and Customer Targeting Database will identify, detail, and rank customer sites for the deployment of all technologies. The SFPUC and SFDOE should task staff with reviewing these assumptions to give feedback in a timely manner. Program design and management should take full advantage of this process, and the Customer Targeting Database should be maintained and updated throughout program operations. Revisions to the deployment timeline should be reflected in the Financial Model.

Operations Phase Management

As with the implementation phase, there will be a number of risk exposures associated with management during the Operations Phase. The management team will be dealing with any technology device failures, installation functionality and integration issues, customer issues relating to both deployment elements and CleanPowerSF program functions, such as tracking customer moves and ensuring that their status isn't changed as a result of moving, ongoing regulatory evolutions, and continuing to deploy remaining elements of the deployment effort. Failures in management can result in delayed correction of functionality or warranty issues, problems arising from financial mis-management, customer dissatisfaction and damage to the program's reputation arising from public or social media.

Mitigations: Evaluate the program management functions needed for successful implementation of the program, and apply the appropriate resources. Work to build appropriate measures into the customer agreements to allow flexibility, and streamline the way the program manages and tracks changes, such as tenant or owner customer moves within the city in situations where they have only partially paid for assets or have been participants in community energy programs. In either instance, there will need to be a management process; to track assets or re-assign memberships in community energy programs. Conduct ongoing market tracking to ensure that potentially negative impacts to the program, such as efforts to entice existing customers to opt-out, are tracked and addressed or offset through positive measures.

Maintenance Risks

Some of the technologies sourced through the CleanPowerSF program may require little or no maintenance. After the expiration of the warranty period, responsibility for longer-term asset maintenance will depend on the contracting approach used to procure the assets, and also on asset ownership. In some instances, such as when Power Purchase Agreement or Design/Build/Operate/Maintain contracts, maintenance obligations are held by the contractors. In other instances, assets belonging to the customers or the CleanPowerSF program will need maintenance. Excessive maintenance costs can erode the financial margins necessary for financing, as well as negatively affecting customer satisfaction with the installations.

Mitigations: This risk favors the use of contracts including maintenance obligations. Products and installations should be evaluated conservatively from the perspective of future maintenance needs, to be able to both predict costs, and to give prospective owners a fair sense of the maintenance need and costs associated with their potential installation.

Revenue Bond Issuance

The City has the ability to issue revenue bonds for the deployment; however, the reaction of investors to the bond offering will be influenced by their perception of the risks and revenue sources available for repayment of the bonds, and the types of backing associated with the bonds. The more it is made clear that the program has properly prepared for the deployment, and has selected technology installations, repayment mechanisms, and contract structures that will support bond repayment, the better the investor response is likely to be to the bond offering.

In order to prepare for bond issuance, the installed capital costs of each type of deployment component, the 'value' the component will provide over time, and the projected repayment cash flow amounts and repayment sources all need be completed and evaluated to determine if the investment 'case' can be made for financing each type of deployment component. Then, for each type of potential deployment component that is in theory 'financeable', a set of responses to expected finance due diligence inquiries needs to be developed; covering the program approaches and risks. The way that risk issues that could impact repayment are addressed, and the availability of backing measures will be of particular importance from the investor perspective.

Failure to successfully demonstrate the financial metrics of each deployment application, and failure to present a coherent, integrated explanation of all factors relating to the potential financing in the due diligence context will impede the ability of the program to secure financing, or result in higher interest costs, if the bonds are not attractive at lower rates because of perceived risks from the investor perspective.

Mitigations: Once the technology specifications, financial modeling, siting evaluations, repayment mechanisms, and contract structures have been completed, the deployment elements should be evaluated on a 'straw-man' basis from the financing perspective, to identify any areas where risks to the financing process can be addressed prior to initiating the actual financing process. Refer to the section below regarding the repayment mechanisms and contract considerations.

Repayment Mechanisms, Contracts, and Collateral

Mechanisms to collect payments from customers for behind-the-meter resources include integrating the site-specific charges into the volumetric generation rate charged to an individual CCA customer, on-bill repayment (OBR) on either customer power or water meters, off-bill contracts, and commercial PACE assessments (property tax assessments).

Contracts in which the customer agrees to the specific terms of the installation and payment are referred to as a power purchase agreement (PPA) for distributed generation and an energy savings agreement (ESA) for an energy efficiency retrofit.

Offering a range of technology products and services to the full spectrum of customer types and profiles will require a system of diverse and flexible customer repayment mechanisms and contracts. Mechanisms and contracts that 'tie' repayment to the meter rather than the customer should significantly increase program participation as well as the average savings per retrofit, as the scale of the retrofit will be based on what makes the most long-term financial sense, instead of on what the customer can afford to implement at a given point in time. Failure to appropriately plan for these approaches to a degree that will satisfy bond underwriters will delay the issuance of revenue bonds and the in-City deployment.

Collateral Requirements

Certain repayment mechanisms allow for greater or lesser collateral requirements for specific customer contracts. Repayment mechanisms that significantly diminishes the potential for customer non-payment over time (for example, the threat of utility power and/or water meter shut-off in the event of non-payment, and/or the ability to 'tie' the repayment obligation to the meter or premise in the event that the original customer moves), typically require lower collateral requirements for specific customer contracts and enjoy relatively low interest rates and longer terms.

Loans that are unsecured either by the repayment mechanisms and/or customer contract will typically only be available to customers that meet certain underwriting criteria (such as a minimum FICO score), and at a higher interest rate.

However, it is worth noting here that evaluating the financial risk on a project specific basis, in which a default means the lender loses all of their investment, requires greater collateral than evaluating the same risk on a portfolio basis, in which a small number of customer defaults would not cause the lender significant losses. The CleanPowerSF program surplus predicted by the draft Financial Model reaches $533MM by year 10, and the total installed cost for all in-City assets during that time period is ~$650MM; therefore, if the program deploys assets at or near the volume predicted in the draft Financial Model, the financial risk of non-payment at a small percentage of sites is mitigated (many times over) through the combined financial performance of the entire portfolio.

Therefore, the collateral requirements for a given contract under the CleanPowerSF program may be able to be less stringent in comparison to the requirements taken if every site were to require full collateral in the event of a default - providing that the overall performance of the portfolio was sufficient to make the lender whole. For example, if collateral requirements by lenders were to exclude a portion of low income or small business customers, the program could elect as a policy decision to set aside a portion of the program surplus to be used as a credit enhancement (such as a subordinated loan product) to negotiate with lenders or underwriters to extend financing to these customer segments.

Mitigations: The SFPUC should proceed with the selection of bond underwriters and negotiate collateral requirements and contractual provisions for type-approved technology deployments and customer types, taking into consideration the use of repayment mechanisms and their impact on the perceived risk of customer non-payment, as well as the potential use of program surplus funds for making lenders whole in the event of individual customer defaults. Further risk mitigating actions the SFPUC may take in regards to specific repayment mechanisms and contractual terms are detailed in the proceeding subsections.

These provisions should be further explored and negotiated as part of the program start-up process, so the necessary provisions may be incorporated into customer contracts prior to executing financed demand-side retrofits on customer homes and businesses. Program design should take into account contracting provisions and procedures that vary by customer type and technology.

Repayment Mechanisms & Contract and Collateral Implications

CCA Generation Rates and Bill Ready PG&E Consolidated Billing

CleanPowerSF has a variety of options for collecting payment from customers. First, CCAs enjoy a unique level of access to report data on each customer's monthly electric bills. CleanPowerSF designs and controls the rate schedule for each customer, and may report charges to PG&E for printing on its monthly bill on page space dedicated to CleanPowerSF. The program has the authority to directly 'roll in' the repayment charges for the asset into an individual customer's CCA generation rate on a volumetric basis, and to disaggregate these charges on the bill under PG&E's Bill Ready PG&E Consolidated Billing tariff. This approach will ensure that the repayment of assets is collected through the electricity bill, keeping transactional costs low in a similar manner to on-bill repayment (below). Also, the Bill Ready tariff would allow CleanPowerSF to include website and customer log in information for the Community Shares portal directly on the customer bill.

Contract and Collateral Implications

The installation of major retrofits and appliances would require the approval of the property owner; as part of this process, the program should explore offering contracts contingent upon future tenant leases and rental agreements stipulating that the tenant must remain a customer of CleanPowerSF until the point in time that all assets are paid off, and that this provision be transferred to the subsequent property owner in the event of the sale of the property. As customer opt-outs are processed by the CCA, this would provide a measure of long-term guarantee of asset repayment.

Mitigations: the City Attorney could appraise the legality of using contracts which prohibit opt-out until the assets are paid off, as described above. This would provide a measure of mitigation to the risk of customer non-payment, and would likely serve to relax the contractual collateral requirements demanded by lenders and underwriters. If this approach is deemed to be not legal or infeasible, the program design and bond issuance may still proceed with increased contractual collateral requirements, and the SFPUC may further consider implementing alternative payment mechanisms as appropriate (described below, some of which may face regulatory challenges or delays).

Increased collateral contractual requirements may include a lien on the property, which could serve to lower the risk of delinquency or default on repayment obligations, and the resulting risk profile and cost of capital to the program. Note that this mechanism remains viable and in use for the residential sector (by SMUD, for example) and not just the commercial sector in spite of the demise of Residential PACE programs for employing a similar mechanism. It would only apply for measures that exceed Title 20 equipment and appliance standards, which would practically result in needing to structure two loans for each comprehensive retrofit. This mechanism would drive up administration costs but remains viable nonetheless.

On Bill Repayment for Power Meters

On-bill repayment (OBR) is another potential repayment mechanism to service the debt on deployed assets, depending on CPUC and PG&E decisions to implement this approach. OBR as a tariff could offer the ability to tie repayment to the meter rather than the CCA customer. This approach is in-line with broader statewide programs: refer to "The California Energy Efficiency Finance Project" subsection below for more details. However, given the CPUC regulatory process and demonstrated reticence of IOUs to fully expand this mechanism, wide-spread implementation may take several years. It should also be noted that Marin Energy Authority has recently received approval for an on bill repayment pilot program this year.

The California Energy Efficiency Finance Project

The May 2012 CPUC Decision in Rulemaking 09-110-14 [2] ordered the continuation of IOU on–bill financing (OBF) and the expansion of energy efficiency financing mechanisms; Harcourt, Brown and Carey, under contract with San Diego Gas & Electric and Southern California Edison, has developed pilot proposals for various financing products, including OBR and various credit enhancements, under consideration by the CPUC to be piloted in 2013 and scaled up in 2014.[3] However, given the CPUC regulatory process and demonstrated reticence of IOUs to fully expand this mechanism, wide-spread implementation may take several years. The financing proposals will be approved in rulings in R.09-110-14, as they were submitted too late to be considered in the October 2012 decision.

The proposals may be downloaded from the website of the California Energy Efficiency Finance Project.[4] The proposals call for the creation of the California Energy Efficiency Financing Hub (the Hub) to act as a 'one stop shop' for efficiency financing, in the near term to pilot OBR and credit enhancements in 2013, with an expanded implementation to follow in 2014, and eventually the expansion of the system to manage contractors and to integrate the analysis of utility and building data for targeted deployments and customer interfaces. Also, the CPUC has been explicit that while utility ratepayer funds for OBF must only support efficiency measures, private sector funds for OBR should also allow the financing of distributed generation.

The management and oversight of the Hub is proposed to be under the control of an IOU for the pilot phase; for full implementation, the appropriate entity to manage the Hub is under discussion, and may include:[5]

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[2] Available from: [http://www.calmac.org/events/EE_and_MEO_2103-14_decision_166830.pdf]
[3] Refer to the California Energy Efficiency Finance Project for more details, available from: [http://www.caleefinance.com]
[4] Available from: [http://www.caleefinance.com/category/all/]
[5] "California EE Financing Hub Pilot Proposal", California EE Finance Project Team, October 1, 2012, page 6.

- State or Quasi-State Agencies such as entities managed under the State Treasurer's office;
- Utilities;
- New or Existing Not-for-Profit Organizations;
- For-Profit Entities.

This statewide process is well-aligned to CleanPowerSF's proposed business model, and depending on the timeline for full implementation, may allow CleanPowerSF to achieve its deployment goals while driving down startup and transactional costs associated with site selection and financing.

Please refer to the "R.09-11-014 and On-Bill Repayment" section of the Regulatory and Policy Report for more details on this initiative.

Contract and Collateral Implications

The possibility that the OBR tariff will allow repayment obligations to be transferred to subsequent customers that occupy the premise, and the ability to turn off the customer meter for non-payment (for the commercial sector but likely not for the residential sector), represent notable risk mitigation measures for underwriters and lenders in regards to customer non-payment. This may drive down collateral obligations required for individual customer contracts, which would serve to increase the rate of customer adoption of behind-the-meter assets.

Mitigations:

Regarding OBR in General: MEA's progress should be monitored and supported by CCSF in regulatory proceedings, if need be. The SFPUC should monitor and intervene in the discussion of shut-off provisions of utility power meters being considered under the OBR design process at the CPUC. The latter appears to be valid for nonresidential customers (~70% of the CCA's potential load) as it is a provision under PG&E's current OBF tariff, but faces legal challenges to implement for residential customer classes. Whether the corporation will cooperate with CCAs to offer this service to customers remains to be seen. Because of this, it is necessary to explore alternative repayment mechanisms in addition to on-bill options.

Regarding the California Energy Efficiency Finance Project: the SFPUC should monitor and intervene directly at the CPUC to support the implementation of an On-Bill Repayment mechanism and management program flexible enough to accommodate CCA innovations to tailor program offerings to local needs. Particular attention should be given structuring OBR as a tariff to allow the obligation for repayment to be attached to the meter, even in the event of customer opt-out. The SFPUC should also intervene to ensure that the eventual management of the Hub does not fall to an IOU, and that the CCA and not the IOU be the point of contact for any customer of the CCA's seeking services through the Hub, as a precaution against anti-competitive activities towards CCAs. The SFPUC should approach MEA and Sonoma Clean Energy to support intervention at the CPUC to ensure that the statewide activities result in a programmatic structure flexible enough to allow innovations that CCAs may want to develop within the statewide program to tailor it to local conditions. Examples of these innovations may include:

- The integration of a site selection process and contractor management system to be implemented more rapidly than the statewide version;
- Expanded repayment mechanisms available to a local government (i.e. water bill repayment and Rent Board efficiency expense pass-through allowances, etc.);
- Expanded collateral enhancements available to a CCA (i.e. using program surpluses to expand financing to hard to reach sectors);
- Tracking procedures to allow the integration of behind-the-meter assets into CCA procurement planning.

On Bill Repayment for Water Meters

The City could also have the option of transferring the repayment obligation from the electrical meter to the water meter, in the event that PG&E obstructs the collection of the charge and/or the customer opts out (and the contracting structure detailed under the "CCA Generation Rates and Bill Ready PG&E Consolidated Billing" subsection above have not been put in place). Staff indicated that this may require a Charter Amendment to implement, but this should be confirmed by the City Attorney. Provisions allowing for the discontinuation of service in the event of customer non-payment would have to be explored.

For the residential sector, this mechanism (with or without shutoff provisions) would be easily deployed for owner-occupied single-family homes, which have a single occupant, water meter, and power meter. For rental houses, the changes detailed in the 'Renters and Owners' section below would have to be completed for this mechanism to be viable, if the landlord were responsible for paying the water bill. The multi-family housing and commercial sectors are more complex; Local Power is analyzing water and power meter account data in the Site Selection process to determine precisely which accounts could be covered by this mechanism.

Contract and Collateral Implications

The possibility that the OBR tariff will allow repayment obligations to be transferred to subsequent customers that occupy the premise, and the ability to turn off the customer meter for non-payment, represent notable risk mitigation measures for underwriters and lenders in regards to customer non-payment. This may drive down collateral obligations required for individual customer contracts, which would serve to increase the rate of customer adoption of behind-the-meter assets.

Mitigations: If necessary, a Charter Amendment should be prepared in consultation with the City Attorney, allowing the SFPUC to assess energy efficiency repayment charges on customer water bills, and adopted. The SFPUC should also consider exploring water shut-off provisions in the event that customer repayment is tied to the water meter instead of the power meter, and the customer fails to pay for the installed assets. As the ease of use of this mechanism various by customer type, the benefits of this approach would have to be weighed against the increased transactional costs for certain customer types, and accounted for in service charges.

Off Bill Contracts

Alternatively, the program could structure off-bill contracts with customers. The Sacramento Municipal Utility District (SMUD) has successfully run an off-bill residential efficiency financing program for the last two decades. The utility has invested over $500 million through the program, which at one point reportedly made them one of the largest community banks in the country.

Contract and Collateral Implications

This would impose an added cost to the program in terms of staff and/or contractor expertise, processing and paperwork, and would require the customer to refer to multiple documents to understand their cost of energy. This approach would also tie the debt repayment to the customer rather than the meter, which would lessen the achievable investment opportunity on many sites unless sufficient collateral were required (for example, though a lien on the property - see mitigations under "CCA Generation Rates and Bill Ready PG&E Consolidated Billing" above).

Mitigations: the SFPUC could further explore this mechanism, and request further information and guidance from SMUD's program administrators.

Property Assessed Clean Energy

Property Assessed Clean Energy (PACE) financing is active for the commercial sector, and is offered by the SDOE. The ability of PACE financing and collateralization practices to offer service to many commercial customers is limited. Nonetheless, this program should be integrated into CleanPowerSF's program design where appropriate.

Contract and Collateral Implications

PACE loans are by definition collateralized by a senior lien on the property. This poses high transactional costs in negotiating with other lien-holders, which drives up the cost of financing. It is not in practice not a valid repayment mechanism for the residential sector, as Fannie Mae and Freddie Mac object to the senior lien position given to the lender. For the commercial sector, given the performance of the real estate market post

Great Recession, this financing tends to be extended to Class A commercial properties and may not be able to be extended to the majority of CleanPowerSF customers.

Mitigations: The San Francisco Department of the Environment has implemented a commercial PACE program, which should be utilized by CleanPowerSF operations where appropriate.

Customer Opt-Out and Project Participation

The levels of customer engagement achieved by CleanEnergy is critical to the success of the program in a number of ways, both directly and indirectly. Foremost, at the policy level, it has been a central theme of the CCA program to make competitively sourced clean power available to the public at large (i.e., as many accounts as possible). Second, with a larger number of customers, the program costs and overheads are spread across a broader base, reducing the amounts applied to each individual customer account. Third, CleanPowerSF customers can become Community Anchor sites or opt for deep efficiency retrofits. All other factors being assumed equal, a larger customer base results in more of these deployments.

High Opt-Out Rates

Higher opt-out rates (initially, and over time) can negatively affect the success of the program in many ways. The current SFPUC strategy for CleanPowerSF Phase 1 is to offer at least 100,000 and up to 230,000 residential customers (out of 340,000 eligible residential customers) opt-out notifications for an initial 100% renewable power product that would increase their rates relative to PG&E basic service.

With this higher rate premium, the SFPUC staff initially indicated that a 30-40% range of customers is forecasted to participate (an opt-out rate of 60%-70% is expected).[6] SFPUC anticipated that 155,000 customers would opt-out, leaving only 75,000 customers among this group being enrolled at the end of the four-month statutory notification process.[7]

SFPUC staff then commissioned a statistical analysis using the polling data to estimate likely customer retention at the precinct level. This finer targeting, to the extent the analysis is accurate, will allow the SFPUC to lower initial customer opt-out by targeting the precincts with the highest concentration of customers who will be willing to pay the Phase I premium.

A partial analysis of this data is shown below:

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[6] LPI December 13 interview with B. Hale and M. Campbell.

[7] San Francisco Public Utilities Commission Meeting Minutes, July 26, 2011, p. 9.

Precincts Enrolled	Residential Accounts	Retained Customers	Opt-Outs	Opt-Out Rate	Opt-Outs: % of Residential Customer Base
195	93,338	50,346	42,992	46%	12%
298	144,862	75,000	69,862	48%	20%
446	208,046	100,075	107,971	52%	31%

As can be seen in the table, the opt-out rate increases with the number of customers enrolled, as more precincts with less favorable polling results are included. The minimum enrollment required for Shell to initiate Phase I service is estimated at 50,000; at this level of enrollment, 46% of customers are projected to opt-out, representing 12% of the overall number of residential accounts in the City.

Under current CPUC regulations, these customers would have to affirmatively *opt-in* in order to participate in the Phase II offering of 51% renewable and demand-side supplied power by 2017, which is anticipated to offer prices competitive with PG&E's basic service. Under an opt-in approach, experience indicates that 90%-95% of customers would not likely opt-in to the program.

The use of an opt-out structure is essential for the ability of CleanPowerSF to capture citywide participation. The attraction and preservation of a high percentage of potential CleanPowerSF CCA customers is of foundational importance for the success of both the wholesale and renewable elements of the program.

Mitigations: take actions to both lower the price premium and the initial enrollment of Phase I. Assess the feasibility of diluting the Phase I price premium by including Hetch Hetchy power, and lowering the overall RPS-qualifying content in favor of "GHG free" and "renewable" products (as Hetch Hetchy hydropower does not count towards the RPS, but is nonetheless GHG free and renewable). If the premium is unavoidable, lower the overall enrollment to the minimum required by Shell Energy to initiate Phase I service (approximately 50,000 customers). Identify opportunities for local renewables and demand side development for Phase I, including a survey to assess interest among potential Anchor site customers. SFPUC should request that LPI develop a scope of work for surveying customers who will be offered service, drawing upon the customer databases created for the broader analysis. The goal of this approach would be to identify as many customers as possible willing to pay a premium for renewable power supplied by Shell before gaining ownership shares in the deployment. The benefit of such an approach would likely be to reduce the opt-out rate of Phase I customers below the level currently estimated.

CPUC Regulations

Interviews and review of AB117 and SB790 indicated that under the current California Public Utilities Commission (CPUC) CCA rules, once a potential CleanPowerSF customer has been offered service with the ability to opt-out, and they have then elected to opt-out, they cannot be offered a second service offering with the option to opt-out. Instead, CleanPowerSF will be required to offer them opt-in service and they must actively select the second offering.[8] While efforts could be made to have the CPUC allow a second opt-out offering,[9] it would likely require a specific determination on this issue by the CPUC. The need for a CPUC determination could be avoided if the enrollment strategy seeks to maximize initial participation choices by customers.

Mitigations: See mitgations under 'High Opt-Out Rates' section. If high opt-outs rates are unavoidable, continue to investigate the feasibility of a second opt-out offering for affected customers.

Relative Success of Opt-Out vs. Opt-In

Experience with opt-in electricity marketing programs during Direct Access has demonstrated the need for the opt-out approach in order for price-competitive retail electricity programs to succeed. Wholesale power aggregation studies of deregulated markets during the early years of deregulation in the late 1990's have shown that opt-in "Consumer Choice" aggregation is extremely limited in achieving successful uptake of electricity customers compared to opt-out "Community Choice" aggregation. To illustrate the difference between opt-out and opt-in, in comparative terms, offering the 235,000 customers a competitive rate with 51% plus green power by 2017 would typically result in 75-90% of citywide business and residential demand, an opt-in program offering the same discount price would likely result in approximately 5-10% engagement. Relying on "opt-in" offerings for subsequent phases of customers would seriously diminish a CCA's likelihood of serving the majority of residents and businesses within a municipality.[10]

Mitigations: See mitgations under 'High Opt-Out Rates' section.

Reduced Customer Base

Losing 155,000 customers harms the economics of the CleanPowerSF program. A simple underlying premise is true for any CCA: the more customers the CCA serves, the better rates and services it can offer. From both the wholesale, renewable, and demand management perspectives, a larger customer base enables the CCA to provide lower rates using economics of scale. Under the Shell contract agreements, customers opting out of the premium 100% renewable service would cause a substantial shrinking of

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[8] Interview with Carlos Velasquez, California Public Utilities Commission, January 13.

[9] LPI has requested clarification of this question from CPUC staff – see Interview Notes with Carlos Velasquez, January 13, p.2.

[10] See "Community Choice Aggregation: An Update," by John Farrell, New Rules Project, Institute for Local Self-Reliance, June, 2009. Also see "Results of Direct Access Pilots," *Group Buying Power: Meaningful Choices for Energy Consumers*, by Kay Guinane, Environmental Action Foundation, 1997, pp. 11-19.

CleanPowerSF participating load. The opportunity to achieve scale and realize the program goals defined in the CCA Ordinances 86-04 (2004) and CCA and H Bond Program Design Ordinance 147-07 (2007) would be negatively impacted by this strategy.

Mitigations: See mitgations under 'High Opt-Out Rates' section.

Negative Press and Customer Retention

Another critical factor for the early success of a CCA program is positive press coverage. As media coverage tends toward the more attention grabbing, sensational element of a situation, subtleties are often not communicated effectively. As such – instead of a more thorough explanation of the various phased service offerings, and the 100% renewable nature of the initial Phase I offering, CleanPowerSF would likely see simplified stories with headlines along the lines of 'Many Customers Opt-out of the Government-Run CleanPowerSF program Because it Would have Raised their Rates."

Mitigations: See mitgations under 'High Opt-Out Rates' section. In addition, well planned, sustained, and effective CleanPowerSF program promotion and marketing emphasizing 'Own-Your-Power'. Positive press emphasizing the community and customer ownership aspects of the program could neutralize potential negative press covering the opt-out premium, if this premium is unavoidable.

Customer Project Participation

For all installations at customer sites, establishing customer confidence in the program will be necessary to secure higher volumes of customer approvals for the installations. If the program provides unclear, incomplete or contradictory information on how the program installations will affect customers, this can cause a community-level ripple-effect where negative word-of-mouth stories prejudice potential customers against involvement.

Mitigations: As a part of program marketing and community outreach, prepare well-developed promotional and informational materials that clearly explain the nature of customer involvement options in the deployment, the benefits to customers, and the roles of the CleanPowerSF program and its contractors. These materials should be consistent in content across web-based documentation, press-releases, paid advertising, direct mail, and customer reach hand-out materials. These materials should strongly emphasize the energy security (both in physical supply and for minimizing rate increases) and 'Own-Your-Power' aspects of the program.

Technology Selection and Functionality

There are a number of types of technology under consideration for acquisition through the deployment. Technology related risks can occur in three broad categories; initial functionality failure where the device in question does not function as required from the outset, application failure where the device is not defective, but it cannot function properly as a result of misapplication or problems with the installation, and failures that occur over time due to defects or insufficient durability. As described more fully in the Initial Contracting Report, functionality risk can be either fully allocated to the private sector, or shared, depending on the type of contract used. For example, in a PPA contract, the CleanPowerSF program would bear no technology risk over the duration of the contract – the power supplier would have to correct any device failures at their cost and risk in order to restore their ability to generate power. The following analysis focuses on situations where some degree of functionality risk would be held by the CleanPowerSF program.

Initial Functionality Failure

For the initial functionality risk, the exposure depends on how the technology has been procured. For example, if the technology product was selected and ordered by a Design/Build contractor where the obligations were performance based, any technologies that do not initially meet the performance criteria under the contract have to be corrected or replaced at the contractor's cost. On the other hand, if the products in question were procured directly by CleanPowerSF for installation through Job Order contractors, and they failed to perform as required, there would be manufacturers warranties, however, there might be collateral costs to the program that are not recoverable, such as additional management efforts, the removal of the defective devices, and re-installation.

The level of exposure to the CleanPowerSF program would largely be driven by the extent of the failures. There will certainly be isolated product failures in any large-scale technology acquisition program. However, if there are widespread technology issues, this will have negative reputational effects on the program regardless of how risk is allocated contractually. In the case of widespread defective product issues where the CleanPowerSF program also has cost exposures, in addition to negative media attention, the additional costs of a protracted product replacement campaign would likely have negative affects on the financing margins for the technology, as discussed elsewhere in this report.

Mitigations: This risk favors greater use of performance specification contracting when possible. For any direct ordering where functionality would be a concern, due diligence steps could be undertaken to verify the manufacturer's testing or other performance validation work, as well as to determine whether other customers have been satisfied with the product and supply company. Contractual measures can also be developed for the RFP's such that any later orders would be contingent on successful performance demonstration of an initial, small volume order. There are also a number of ways in which warranty provisions for larger volume orders can be tailored to fit the nature of any potential exposure concerns. For example, there could be prompt shipment provisions for replacement parts to mitigate the customer satisfaction risks, or there could be a liquidated damages penalty that occurs contractually if a pre-set percentage threshold of failures relative to the overall order quantity is exceeded. The purpose of the penalty would be to offset predicted costs that the CleanPowerSF program might incur in removal and reinstallation. However, more stringent warranty provisions need to be considered in terms of their cost; suppliers will only be willing to provide additional protections if they feel that they are being fairly compensated for doing so.

Application Risks

This risk occurs in instances in which products are not functionally defective; instead, they are unable to perform as required anticipated due to errors in design or selection for a given installation. This could relate to site selection, incorrect technology application or integration. The direct effects would be underperformance from the customer's perspective, and any costs to the CleanPowerSF program associated with correcting the problems. The indirect results could include financial failure, if the product(s) are generating insufficient power or savings relative to the break-even points required to sustain the financing.

Examples would be placement of wind generation units that were sized inappropriately for a location's wind resource levels, or installation of a demand management device that was mis-matched with existing installed equipment, causing the other equipment to fail or malfunction, overheat, or resulting in computer-related issues. Another example would be energy saving installations, if insufficient work was done prior to installation to determine whether an efficiency or demand management installation would be able to generate the anticipated levels of savings, and the installation ends up failing to provide the anticipated levels of energy savings.

Mitigations: This risk favors greater use of performance specification contracting when possible, so that the responsible contractor has to correct any application issues, or replace products not suited for any applications in question. It also indicates that for efficiency and demand management measures, working to ensure high levels of thoroughness and accuracy in the initial energy audits will help increase confidence in savings projections, and avoid incorrect technology interface results. The siting evaluations should be sufficiently robust to avoid placing technology elements in locations where the power generation resources, i.e. solar or wind, are not sufficiently available to provide the required outputs.

Warranty provisions can also be tailored to the anticipated risk exposure – for example, if computer interface issues were anticipated, having warranty provisions that include responsibility for correcting computer interface issues might prompt the involved installers to more carefully determine whether an installation would be successful relative to software integration than might be the case if the warranty just covered device replacement. However, more stringent warranty provisions need to be considered in terms of their cost; suppliers will only be willing to provide additional protections if they feel that they are being fairly compensated for doing so.

Longer Term Functionality Risks

The sustained functionality and durability of the deployment components are central to both the success of the program's financing and to achieving high levels of customer satisfaction. If there are significant levels of 'post-warranty' deployment technology failures, there will be negative consequences that could include additional costs associated with equipment repairs or replacement, technology outages that interrupt power generation or efficiency savings, and thus negatively impact the program's financing, and damage to the program's reputation.

Mitigations: Our interviews with capital program staff at the SFPUC indicated that longer-term warranties have been used successfully for past SFPUC renewable energy installations. In addition to securing optimal warranty terms, this risk also favors the use of performance or output based contracting to shift longer-term functionality risks to contractors when possible. For some types of technology, adding longer-term (10yr.+) contractual operations or maintenance obligations on a fixed price basis can be an appropriate method for ensuring that the supply contractor 1) takes durability into account during design and installation, and 2) is required to keep the equipment in proper functional condition throughout the contract term without additional compensation.

Asset Procurement and Contractor Selection

Commercial failures resulting from the way that the acquisition and selection processes for the deployment technologies are conducted can lead to a number of types of adverse results.

Lack of Competition

For some proposed technologies, there may not be sufficient market depth to generate sufficient competition among bidders. Especially with larger volume orders, the presence of market competition is essential in obtaining good value in bid pricing.

Mitigations: 1) Conduct cost range analysis prior to RFP issuance to determine acceptable cost range. 2) Use sole source justification procurement approach if necessary, possibly including 'open book' cost negotiation with suppliers to ensure that pricing is fair and reasonable.

Supply and Production Capacity Issues

In some instances, there may be technology suppliers that have developed a successful product, but are not capable of producing it in the volumes that may be required to support demand volumes that may occur through the deployment.

Mitigations: Require bidders to identify and describe their production capacity, work to encourage local/regional assembly or manufacturing if supplier does not have sufficient capacity.

Under-Developed Products

For some proposed technologies, there may not have been sufficient product development to ensure that ordered products will meet the required functionality, durability and quality requirements of the program. Some of the areas where this may be an issue are: Storage (very few suppliers, non-commercialized for distributed storage), OpenADR (medium level of supplier depth, some big players), Wave (very few suppliers, non-commercialized), Tidal (very few suppliers).

Mitigations: For instances where a technology has not had sufficient market introduction to identify and address functional or quality issues, utilize contractual terms that require the supplier to provide a small volume 'pilot' order at partial cost, making any larger volume, full-price orders contingent on the successful performance (or correction of functional issues) of the pilot order.

Supplier or Contractor Financial Failure

Failures in diligence during the procurement process can lead to greater exposure to loss of supply or financial problems if a supplier has a business failure. Contractor failure can leave a one or more project incomplete, with a set of negative consequences both in customer management and financial exposures of additional costs incurred to have another contractor complete the work. Another concern would be failure of warranty response.

Mitigations: While diligence cannot predict every instance of future business failure, it can help avoid dealing with firms that are already in trouble. Payment terms also need to be carefully structured so that firms are not paid in advance (more than nominal order confirmation - deposit amounts) for orders. Warranty bonds can be required in instances where there would be substantial negative cost impacts to the CleanPowerSF program if a company failed to honor its warranty obligations.

Contractor Selection

In general failures of diligence in contractor selection can cause risk exposures to the CleanPowerSF program. The Initial Contracting Analysis recommends supply contracts, and four types of installation contracts; Supply, Job Order, D/B, DBOM and PPA. From the contractor selection risk perspective, the installation contractors can be viewed in two groups, regardless of the type of contract. The two types are those that will participate in more complex, and larger scale projects, and those that will work on smaller scale installations on a repeat basis. The roles of the types of contractors listed here are described in further detail in the Initial Contracting Analysis.

Larger Scale Project Contractors

For larger scale projects, such as larger wind or solar installations, or cogeneration, poor contractor performance can have a number of negative effects. Issues can include poor quality work, abandoned partially complete projects, financial malfeasance, unpaid subcontractors and suppliers, contractors that are understaffed or otherwise fall behind on a number of projects; so their work progresses sporadically, leaving construction sites open and delaying project completion, and the engagement of contractors that apply an adversarial approach in their dealings with the CleanPowerSF program. Some of the larger scale projects will be located on CleanPowerSF customer owned sites, and some may be located more remotely. For any projects at customer sites, insufficient diligence in contractor selection can lead to additional contractor related risk exposures to the program. Poor contractor performance on customer owned sites can result in damage to customer sites and property, customer dissatisfaction, damage to the CleanPowerSF program's reputation if bad experiences with contractors result in media exposure.

Mitigations: Require contractors to complete a pre-qualification process that requires review of their past performance, client references, financial stability and bonding and insurance.

Smaller Project Contractors

The types of projects that will be conducted more frequently will likely be done by smaller contractors including small solar installations, and efficiency or demand management installations. Unlike the larger contractors with clearer records, it can be more difficult to accurately screen smaller contractor firms. Because it may be necessary to engage a number of smaller contractors in parallel, the challenges inherent in the management and oversight of multiple contractors can result in under-supervised contractors. The negative effects of poor contractor performance over a number of smaller installations can include poor workmanship, incorrectly installed devices, unsafe installations, damage to customer sites and property, theft of supply/device items owned by CleanPowerSF, fraudulent pricing and project completion assertions, customer dissatisfaction, and damage to the CleanPowerSF program's reputation if a sufficient number of bad experiences with contractors result in media exposure.

Mitigations: Require firms to provide sufficient background information and references prior to approval for Job Order Contracting, conduct field oversight, provide customers with a complaint line so that any patterns of issues with particular contractors can be identified and resolved quickly.

Community Installation Opposition

In some instances, there may be community issues related to a proposed installation. Local or interest group opposition can either prevent a project from advancing, or add significant delay and costs relating to the processes necessary to resolve the issues leading to the opposition. The most pronounced exposure relative to these factors would be in instances where a larger-scale installation was already in progress, and community reaction resulted in suspension of the work until issues raised by the community were resolved. The suspension of a complicated installation project necessarily increases project costs; workers have to be re-deployed, open construction work has to be temporarily secured for safety and weather protection, etc., and there are ramping-up costs once the project is cleared to proceed. These types of 'no value' cost-overruns can negatively impact the project's financing.

Mitigations: Once a project has been identified for installation, community outreach efforts to familiarize community members with the scale and aesthetics of the project, the timing of construction work, and other relevant factors can help dispel erroneous concerns, and provide opportunities for issues to be raised and discussed before the project work is initiated. Community benefits can also be promoted to help reduce opposition. These can include direct project benefits, such as from a community solar installation, or indirect benefits, such as employment and job skills training that may be associated with the CleanPowerSF program. Emphasizing customer ownership opportunities may lessen opposition if residents of an impacted neighborhood have signed up to own shares in a proposed facility.

Site Related Risks

Inaccurate assessment of existing installation site conditions can have a number of negative consequences. Two main types of results can occur; the necessity to incur additional unplanned costs to remedy a condition prior to installation, or cancellation of the project, and loss of the 'sunk costs' expended to advance the project. A second risk area is associated with the required access agreements, where there may be site-owner resistance, or requests for unfavorable terms in the Site Access Agreements. In some instances, site-risk will be borne by the supply/installation contractors. In instances where the CleanPowerSF program is involved in site selection the following mitigation measures can be considered.

Mitigations: Our interviews with SFPUC capital project staff indicated that the SFPUC has a thorough and effective pre-installation site evaluation process. It will be important to conduct effective and thorough site and building inspections from the structural and electrical perspectives as a pre-condition for advancing smaller projects. For larger projects, use of turnkey and performance contracting can shift some of the site-related design and construction exposures to the contractor, especially in instances where the contractors are at liberty to make site selections among CleanPowerSF-identified candidates. To address site-owner concerns, the basic site access agreements should contain terms addressing typical owner concerns. It would also be helpful to have a general policy that allows for consideration of reasonable case-specific accommodations, with the caveat that the program will not entertain protracted negotiations, or make extensive or costly commitments in order to secure a given site.

Regulatory Risks

Risks associated with the regulatory environment can affect the deployment in a number of ways. Unexpected compliance costs relative to existing regulations can cause cost-overruns, and the adoption of new regulations can add obligations that apply to the program.

Existing Regulations

Failures among project implementation participants (whether contractors, PPA power suppliers, or CleanPowerSF program) to anticipate the obligations or costs associated with regulatory compliance can cause cost overruns, or in extreme cases, project cancellation.

Mitigations: For each element of the deployment, participants should work to become familiar with the applicable regulatory requirements, and the anticipated costs of applicable regulatory compliance should be calculated as part of the implementation costs. In cases where substantial volumes of deployment components will fall under the jurisdiction of a regulatory entity, it may be helpful for CleanPowerSF staff to conduct early coordination efforts with the regulatory entity, so that the chances of unexpected regulatory compliance obligations are reduced.

Developing Regulations

At the date of this report a number of regulatory entities are in the process of developing or modifying regulations that will or could apply to various aspects of the CleanPowerSF program. These developments are addressed in our Regulatory and Policy Report. From a risk management perspective, the main exposure arises from timing differences between the progression of CleasnEnergySF program elements, and the evolution of applicable regulations. In some instances, an element of the CleanPowerSF program may be 'grandfathered' if a new regulation goes into effect after the program element is in operation. However, the main risk is that it will be necessary for other reasons to advance parts of the deployment and other elements of the CleanPowerSF program to address other timeline or financial factors, and then regulatory events occur that negatively impact the program elements.

Examples include classification of different technologies relative to rates or to resource adequacy requirements, or regulatory changes that affect the costs of power either bought or sold by the CleanPowerSF program or its customers, or affect definition of over-the-fence systems, and changes in transmission or generation rates.

Mitigations: Continue to track evolving regulations, and where appropriate participate in development of regulations appropriate to support CleanPowerSF program goals.

Environmental Issues

Many of the CleanPowerSF installations will be inside existing facilities, or otherwise located so that there are no significant anticipated environmental impacts from the installation or operations of the technology elements. For the larger-scale external installations where environmental considerations apply, it is anticipated that the site selection and permitting processes would address any identified environmental issues. This leaves only the risk that an environmental issue is discovered only after a project installation has begun. In any such instance, there are likely to be both cost and delay exposures arising from efforts needed to address the environmental issue(s). These could negatively impact the overall economics of the installation, if they significantly alter the break-even points or other factors used in establishing any financing used for the project in question.

Mitigations: This risk underscores the importance of diligent initial review processes for any projects with potential environmental issues, and the need to ensure that no such projects are initiated without having all final environmental approvals and permits in hand.

Cost Risks

Capital Costs

A key goal of the deployment is achieving capital cost targets for each installation. Each technology will have been evaluated for acquisition as part of the financial analysis. To be selected for acquisition, the technology elements will have to have been demonstrated to have financially viability. In general, this can means that the financial value of the energy generation or savings from the technology can be expected to surpass the capital cost in a short enough time period to either a) be sufficiently attractive from a customer's perspective to drive direct purchase decisions, or b) to support capital cost financing.

The first cost risk exposure occurs during the procurement process. If RFP responses generate quoted supply prices or project bid costs that are higher than predicted, but still within the acceptable range, the procurement can be advanced, and perhaps costs can be reduced through negotiation to clarify cost contingencies or reductions in scope. If the costs are out of range, the procurement can be cancelled.

Capital cost growth after successful procurement processes is addressed in two categories:

Technologies acquired through Customer Direct Purchase

Capital cost growth risk is relatively simpler in the context of any technology devices that can be ordered through the CleanPowerSF program. This is because for the most part, these transactions are more straightforward and typical than some of the larger or more complex deployment transactions. An example would be a small solar or efficiency installation, where the CleanPowerSF program has secured lower unit pricing through a volume-based order, and then made installation available to customers on a Job Order Contract basis. (See LPI Initial Contracting Analysis for explanation of these supply and installation arrangements.) For the most part, the capital cost is fixed at the outset – the unit cost is known, and an estimate has been agreed on for the installation.

The cost of the technology units may change over time, but these changes would only affect future customer choices, the terms of the supply contracts would lock pricing for given time periods. Any attempt by the supplier to increase pricing on a given order would be contested contractually by the CleanPowerSF program. And if after the initial RFP process, a supplier quoted future prices for their products that were outside of the acceptable range, no future orders would be placed.

The installation costs should only be subject to increase under specific circumstances identified in the Job Order Contract governing unanticipated conditions at the installation site. An example would be a situation where a part of the building only accessible after the installation began turned out to need reinforcement for the installation. In any such instances, the installation cost would be renegotiated with the customer to account for the additional costs relating to the unanticipated condition, as would be the case for any kind of residential or smaller value commercial installation contract. If the Job Order Contracting program is not subject to sufficient oversight, laxity in estimating could cause a broader impact if a number of customers complain that they were quoted lower prices and the 'gouged' by the contractors on questionable pretexts.

Mitigations: 1) Unit cost control: ensure that supply orders contractually lock prices for all orders. 2) Installation cost control: program management requirements addressing and emphasizing the importance of accuracy in the customer installation estimate processes, and creating a review and approval process for any requested installation cost increases that places the burden of fully demonstrating the cost impacts any changed circumstances on the Job Order Contractor.

Technologies Financed through the CleanPowerSF Program

Cost growth risk is an over-arching risk for any technologies financed through the CleanPowerSF program or otherwise, as cost growth can be one of the results of many of the risk elements described in this report.

Because the long-term future market value of either the electricity a device may generate, or the electricity usage savings it can provide to the user over time, cannot be predicted with perfect accuracy, the financial modeling for any financed equipment has to be somewhat conservative. Similarly, the device cannot be assumed to physically function at peak output at all times in the financial modeling, and a more conservative output has to be assumed. These two conservative factors create the 'cushion' required to support financing – that is, the financial case for a technology can be made if it is shown that, even if electricity market value is lower than generally anticipated, and even if the device output is lower than optimal, the resulting economic value of its output over the financing term will still be sufficient to support a favorable financing decision.

The above points describing the financing 'cushion' highlight the importance of capital cost control. Every significant capital cost increase on a more complex financed technology installation eats into the financing 'cushion' by changing the ratio between the value of the energy generation or savings, and the capital cost. The higher the project costs rise, the longer the repayment term, and the more money owed before the 'break even' point is reached.

Mitigations: For the financed elements of the deployment, capital cost control has to be addressed on two levels. First, in order to secure financing in the first place, sufficient cost control measures and practices have to be in place to assure investors that the risks of 'cushion eating' capital cost growth are low. Second, during the actual implementation process, a) the procurement and contracting efforts for more complex, financed projects should favor the use of fixed price, performance based turnkey contracting approaches that shift most or all cost growth risk to the contractor(s), b) efforts can be made to determine if negotiation of labor agreements for the CleanPowerSF Projects would allow for pre-established and thus factored wage increases, and c) appropriate management and oversight practices need to be applied to manage contractors and suppliers, to prevent or minimize exposure to cost increases that would be borne by the CleanPowerSF program.

Operations and Maintenance Costs

As discussed above relative to capital costs, operations and maintenance costs that exceed predicted ranges can also erode the 'cushion' required for successful financing. Many of the deployment elements can be expected to have no or negligible operating and maintenance costs. These include many demand reduction or efficiency devices, such as lighting products or thermostats. For larger, more complex, financed installations that involve integration or balancing between devices, or larger scale equipment such as a large wind-farm, unanticipated maintenance costs or circumstances where more oversight and management costs are incurred would reduce the capacity of the installed technologies to repay the financed costs within the required time periods.

Mitigations: The risk of operations or maintenance cost growth favors the use of fixed price, performance based turnkey contracting approaches that include operations and maintenance, and shift most or all cost growth risk to the contractor(s).

Permitting Risks

A main goal for the permitting process from a risk management perspective is that it should be predictable as to its timeline and cost. Permit-associated delays can have a number of negative consequences, including 'hamstringing' projects that are otherwise in progress, customer dissatisfaction with program pacing, and loss of competitive supply pricing if volume orders are not satisfied. Permit-related cost overruns can occur if permit fees rise due to circumstances on a given project, or permit-imposed technical requirements for a project drive costs up.

A second factor is the determinations of whether certain deployment technology projects would be governed by regulations requiring more extensive and expensive permitting requirements, such as the CEQA requirements. Inaccurate determination of whether a project is subject to CEQA requirements could result in unnecessary delay, both in terms of time and staff resources, which could in turn impact project finances.

Mitigations: Acceleration of projects in San Francisco will depend upon preparing city agencies to expedite and assist with the City's CleanPowerSF deployment. The CCA deployment process will require an integrated planning approach to site identification, approval and development that minimizes the likelihood of City-side delays to the planned deployment. While each facility will go through its own separate permitting process, the selected program approach should facilitate rapid processing and minimization of unnecessary permit review triggers. Permitting documentation required for each technology and installation should be identified ahead of time, and collected in a timely manner.

The ability of CleanPowerSF to plan for and achieve the required RPS acceleration and deployment will depend in part on the SFPUC's relationship with its local permitting agencies as well as with state and federal agencies, and establishing locally streamlined processes of facility approval, permits and construction to expedite the overall process. Refer to the Permitting Report for recommendations.

Careful determination of CEQA application will be important in terms of decisions to advance each type of technology. Our initial evaluation of CEQA determinations were contained in the Permitting Report, and will be validated with the lead agency prior to our final recommendations in the Deployment Report, and thereafter with RFP respondents (for larger-scale projects).

Utility Rate Design

Anti-Competitive Rate Design

A specific area of concern is that PG&E will expand the use of non-bypassable surcharges (such as 'network access charges') as a way to recover revenues lost from load reduced through onsite generation and demand-side measures. PG&E could also make changes to its rate design such that generation costs are recovered through its distribution charges.

Mitigations: Prioritize the deployment of behind-the-meter investments will lessen the impact of cost-shifting, as these assets offset the full retail bill (as opposed to only the generation portion of the bill). Intervene at the CPUC to attempt to protect against further cost shifting, and the potential for increasing non-bypassable surcharges. If action at the CPUC is insufficient to protect against anti-competitive rate design, petition the legislature to pass a law reversing and prohibiting future cost-shifting and non-bypassable surcharges.

Competitive Rate Design

PG&E may implement customer rate schedules that are innovative and a 'value-add' for certain customer classes. One example is the implementation of dynamic rates coupled with enabling technologies for the medium-sized commercial classes.

Mitigation: CleanPowerSF should seek to accelerate innovation in customer-focused rate design applications for the generation portion of retail rate schedules, and monitor PG&E's rate design efforts. A rate database should be constructed or licensed, and used to compare individual customer bills under both CleanPowersSF and applicable PG&E rate schedules on an ongoing and forward basis, to ensure the program remains competitive.

Demand-Side Management

CleanPowerSF will deliver tens to hundreds of thousands of demand-side retrofits, and will fully finance the installations in contrast to the dominant paradigm today, in which customers are asked to pay 40% to 60% of the costs up-front (after utility rebates). Financed efficiency involves a sharing of savings that result from installed efficiency measures in a CleanPowerSF customer's home or business. Through an Energy Services Agreement (ESA), a portion of the associated bill savings should be diverted to cover the cost of program administration, debt repayment, and to directly provide funds to the CleanPowerSF program. This is similar to the business model of an energy services company (ESCO), but applied to the whole City. Depending on the customer type, efficiency savings typically cost 3-5 cents/kWh (levelized cost), while average retail rates are 13-18 cents/kWh; there is ample room for a 'win-win-win' in which the customer, the program, and all ratepayers benefit greatly from expanding energy efficiency.

Delivering energy efficiency as a service through ESAs, provided adequate repayment mechanisms and contracting structures are put in place (see "Repayment Mechanisms and Contracts" section above), overcomes numerous barriers that exist under the current paradigm of providing rebates and asking customers to pay for upfront capital costs.[11] Among them are:

[11] For more details on these barriers in California, refer to the 2012 report prepared for the California Energy Commission: Harcourt Brown & Carey (HB&C), *Energy Efficiency Finance in California: Needs and Gaps.*

- Bill Neutrality: the loan repayment may be structured to match or be lower than the monthly utility bill savings, resulting in a positive cashflow for the customer immediately.
- Landlord-Tenant Split Incentives: when property owners must pay the costs for capital improvements, and tenants pay for the energy bills. Many commercial leases stipulate this arrangement, and rent control regulations limit the costs that a property owner may pass through to residential tenants. This precludes deep investment into energy efficiency, as the landlord must pay the cost but the tenant receives the financial benefit. Not requiring the landlord to assume the debt payments for efficiency installations mitigates this barrier.
- Initial Cost: the capital cost of efficiency is a barrier to program participation for many customers (which financing directly mitigates).
- Longer Paybacks: related to Bill Neutrality, financing can match the payback or even lifetime of the measures installed, leading to deeper retrofits.
- Avoidance of Debt: as an off-balance sheet mechanism, program financing will obviate the need to pay for efficiency measures out of capital budgets (which are typically harder to access). This is relevant to commercial and institutional customers, which may not have the desire or ability to assume more debt.
- Opportunity Cost of Capital: in which the energy efficiency retrofit may make financial sense, but the customer may well make investment decisions based on broader criteria. For example, a business may wish to spend its limited capital on its core competitive activities rather than building and appliance upgrades.
- Transactional Costs: while energy efficiency financing mechanisms do exist for certain customer types (but not all, in practice), navigating available options and negotiating with lenders directly adds a transactional cost to each project, and is also a hassle for the customer. Both of these drive down participation, and are avoided by having the program itself structure and execute financing agreements.

Delivering energy efficiency as a service through ESAs mitigates the above risks to the success of CleanPowerSF's program.

Renters and Owners

The program should facilitate contracts and mechanisms that allow building owners to approve upgrades, and tenants benefit from lower utility bills.

For residential properties, the Rent Board currently allows a limited number of efficiency improvements to be made and the cost passed on to renters, capped at the estimated bill savings and bound by certain amortization periods. This list has to be updated; selection of amortization periods may also need to be broadened, which could require the Rent Board to create an exception to their current practices.

For commercial properties, lease agreements may stipulate that the landlord pays for all capital improvements while the tenant pays for the energy bills. As noted, the financed efficiency approach mitigates this barrier, as the landlord is not required to pay for the measures up front, and the tenant enjoys lower bills while also over time paying off the measures installed.

Mitigations: The Rent Board's amortization periods and list of approved efficiency measures should be expanded and aligned with CleanPowerSF program design.

The Value of a Negawatt

Another barrier to customer adoption of energy efficiency is uncertainty surrounding the financial benefits of the efficiency measures installed. Selling efficiency is in a large part convincing the customer of benefits that cannot be measured directly, as it results in the avoidance of consumption. In addition, many customers may temporarily see bill savings after the retrofit, but then will install a large appliance (plasma television, hot tub) and will see their bills increase. This is sometimes referred to as the 'hot tub' effect. If the customer is unaware of this effect, it could negatively impact their perception of the program. This is less of a problem for more larger and more sophisticated customers, as they typically employ maintenance personnel that understand these issues, and the project is large enough to negotiate a highly tailored ESA. For smaller commercial and residential customers, care must be taken to explain these issues and implement appropriate ESAs.

Mitigations: For smaller projects: employ point-of-sale software that allows for transparent demonstration of projected bill savings; explain the 'hot tub' effect to the customer; and implement an ESA that takes this into consideration, for example by calculating a customer baseline using historical meter consumption and weather data. Incorporate similar functionality into customer web-portals, such that the customer may see how much their efficiency measures have saved them in energy costs, and what their bill would have been absent the installed measures. For more complex projects at larger sites, the use of 'Smart Building' end-use metering equipment and associated pattern-recognition software should be deployed (where cost-effective), both to monitor and prove savings, and to guard against savings degradation over time (continuous retro-commissioning).

On Bill Financing and Utility Cost-Shifting

CleanPowerSF will be recouping the full cost of delivering efficiency through its customer repayment agreements. In contrast, the utility programs may try to 'hide' costs to the participating customer by continuing to charge all ratepayers public purpose and procurement funds for efficiency, and use these funds to subsidize the apparent cost of delivered efficiency to select customers through OBF programs. In other words, even if CleanPowerSF delivers efficiency at a lower price than the IOU programs, the customer may be able to enjoy lower costs though PG&E's programs, because of cost shifting. As detailed in the 'Public Purpose Funds' section, CleanPowerSF should apply to administer the funds collected in its territory through the Public Purpose charges.

However, these funds may not be all that PG&E collects for efficiency through the distribution rates of CleanPowerSF customers.

Mitigations: Monitor and intervene at the CPUC to contest efficiency fund mechanisms that unfairly disadvantage CleanPowerSF programs. Monitor PG&E's program and financing designs to ensure that CleanPowerSF offers remain competitive. Accelerate the development of efficiency financing such that CleanPowerSF enjoys as long a 'head start' as possible when compared to PG&E's programs.

Public Purpose Program Funds

CleanPowerSF should apply for and administer a portion of the energy efficiency funds from the CPUC, collected from ratepayers through non-bypassable surcharges. As detailed in the Regulatory and Policy Report and excerpted here, this is an inherently political process, and could result in the program receiving less than $5 million or over $30 million a year.

The IOUs consistently seek to limit the window in which a CCA may apply to administer these funds to the period in time when the three-year program cycles are being designed. This is arbitrary, and severely disadvantages CCAs that do not happen to start-up at that moment in time. The CCSF is actively contesting this issue at the CPUC.

In brief, there are two ways in which a CCA may receive efficiency funds from the CPUC: California Public Utilities Code Section 381.1(a), implemented by AB117, allows the CCA to apply to administer funds collected from all customers in its geographic boundaries, regardless of whether they are CCA customers or IOU customers. Approval is left up to the CPUC's discretion, which must weigh the benefits of the proposed program in the context of the public interest and extant efficiency program goals; as such, the CPUC has proposed that CCA's applying for funding under 381.1(a) submit their applications concurrently with the IOUs and other program implementers, in line with the three year program cycles. The next opportunity for applying for these funds would be for the program cycle starting in 2015.

Section 381.1(e) and (f), implemented by SB790, allows the CCA to elect to administer efficiency funds collected from its customers. CPUC approval is limited to certifying that the CCA's application meets certain requirements, and the CCA may apply for this funding at any time; however, the efficiency funds that a CCA is eligible to administer under 381.1 (e) and (f) may become constrained because of the CPUC's interpretation of a specific provision in SB790 (Leno, 2011). Text in the final bill states that a CCA may elect to administer efficiency funds collected from its customers "except those funds collected for broader statewide and regional programs authorized by the commission." The original language stipulated that the CCA would "coordinate" with broader statewide and regional programs. The CPUC is currently defining 'regional' programs as those offered in one IOUs territory but not in others. The practical result of this language could be to further divert efficiency funding that should rightly be administered by CCAs to programs heavily influenced or directly administered by IOUs. The IOU's want to further expand this definition to encompass practically all extant efficiency programs, leaving very little funds left over for CCA administration. As the bill was originally introduced to protect CCA's from anti-competitive behavior by IOUs and it would be unfortunate if the CPUC were allowed to interpret this section in such a way as to further decrease a CCA's authority to administer efficiency funds *collected from its customers.* The CCSF should continue to actively contest this issue at the CPUC.

Mitigations: The SFPUC should engage the SFE and City Attorney's office to elect to administer energy efficiency funds collected from its customers under 381.1(e) and (f) as soon as CleanPowerSF commences operations, and should prepare a comprehensive application in close coordination with SFE to apply to administer all efficiency funds collected from all customers in San Francisco under 381.1(a) for the program cycle beginning in 2015, The SFPUC should also continue to intervene in both continue contesting the limitation on when a CCA may apply to administer these funds, and in the CPUC's broad interpretation of 'regional programs', which disadvantages CCAs.

Revenue Requirements and Community Shares

Own-Your-Power 'community shares' involves long-term payments from each customer through paying their CleanPowerSF bill, with accelerated ownership available for a premium and for sites that elect to take part in the deployment (as Anchors for large scale installations, or electing for deep energy efficiency retrofits). Instead of site-specific asset ownership, each participating customer owns a non-specific share of the deployment. The program will establish site control of onsite renewable and cogeneration systems at select sites, which will ensure access, reduce operation and maintenance costs, security costs, and insurance costs.

Because San Francisco has a high proportion of renters, separating ownership from site selection through virtualized ownership enables high customer participation, and means the actual deployments may target the most financially attractive opportunities.

Customers benefit by 1) having direct access to the power if the generation is locally networked, and 2) offsetting their power bills by any amounts recovered by the community share from the sale of power and additional revenue after the assets are paid off. This approach reduces risks associated with having a financed asset owned by an individual, because any community shares customers that stop paying their bill, or opts-out to PG&E basic service 'frees' their shares to be available for another local customer.

Assuming that the installation was functionally successful, if there were failures from the management perspective, either in obtaining initial share commitments or if customers decide not to keep their shares, and replacement customers are not promptly engaged, the reduced participation presents a financing repayment risk (regarding any accelerated ownership premium share subscriptions).

Mitigations: Depending on the projected cost of service, customer average rates may be below PG&E's, in which case this risk is obviated. If the reverse is true, subscribing premium customers may become a priority for CleanPowerSF. The draft Financial Model predicts that the CleanPowerSF program surplus reaches $533 million by year 10; adding to this the customer savings from negotiated agreements brings the total to $610 million, which is equivalent to an 18% generation rate discount for every customer on average over all years. Therefore, if the program deploys assets at or near the volume predicted in the draft Financial Model, this risk should be obviated. This will be further quantified in the final Financial Model after the Site Selection analysis is conducted.

Customer Non-Payment

A core goal of the deployment is to support broader availability of renewable and efficiency technologies, by leveraging customer's power bill payment capability, as opposed to traditional rebate and subsidy programs, which tend to help reduce overall technology costs for customers who could provide more of the up-front capital costs on their own. While the overall pattern of power customers is typically stable in terms of bill payment, with eventual losses around 0.35%, there are some potential payment issue scenarios that will need to be addressed in program design and management.

The overall intent is that the deployment technology selection process will focus on having each customer's bill 'balance' lowered and stabilized as much as possible – such that power generation or savings offsets the added portion of the bill that goes toward capital and finance costs. However, there will still be customers (as with any utility company) that fall behind and can't pay their bill – not in particular because of the costs associated with the deployment. There also may be instances where deployment customers who rent or own decide to move, and although the repayment for the deployment would transfer to the next occupant – the property sits empty instead for an extended period, thus 'stranding' the equipment.

Mitigations: For distributed generation and storage technologies, the contractual terms to be offered customers should address non-payment issues and transitional situations to ensure that deployment equipment can be retrieved if customers do not recover their ability to pay the electric bill past a pre-set grace period, or if the property where a deployment installation is remains vacant past a pre-set time period. For demand-side retrofits, in which it is either not feasible or cost-effective to remove the installed measures, please refer to the "Repayment Mechanisms" and "Collateral Requirements" sections above. Also note that the program surplus predicted by the draft Financial Model reaches $533MM by year 10, and the total installed cost for all in-City assets during that time period is ~$650MM; therefore, if the program scales up at or near the volume predicted in the draft Financial Model, the risk of non-payment at a small percentage of sites is mitigated through the combined financial performance of the entire portfolio.

Legal Risks

In addition to specific legal subjects addressed in this report, there will be a set of legal risks that will need to be identified and evaluated over the course of the program. These include liability associated with installations and ongoing operations, support relating to permitting and regulatory issues, issues arising from contractor no-compliance with applicable elements of the contract provisions, and issues involving insurance or litigation.

Mitigations: Engage legal support at appropriate points in the program's advancement, to ensure that legal risks are considered and appropriately addressed.

Intellectual Property

Some of the technologies may include elements that the supply companies view to be proprietary, such as software code. If there are installations where computer-related failures, or other failures involving proprietary technology can shut down critical equipment, the inability of CleanPowerSF or customers hosting the installation to access the required 'core' software or other technical information needed to correct the problems can cause a number of negative consequences.

Mitigations: This risk favors the use of technologies that do not contain proprietary components. When unavoidable, develop appropriate contractual measures that provide acceptable protections for the CleanPowerSF program from the supplier's perspectives, which may include escrow arrangements for key software components and other proprietary information, so that it can be made available under failure scenarios if the supplier is no longer active, or otherwise is unable to participate in solving the problem(s). For critical computer functions, industry standard remote location backups and other commonly used protections can also be required avoid 'shut-down' types of failures.

Risk Associated with Natural Gas Aggregation

Financing and deploying measures which offset natural gas usage (such as energy efficiency appliances and building retrofits, solar thermal, and combined heat and power applications) are part of the CleanPowerSF deployment. However, the program may in addition consider offering natural gas commodity aggregation services. Some of the political risk associated with CCA does not appear to be an issue relative to natural gas service aggregation, with a perfunctory PG&E process under tariffs, and significant municipal procurement of natural gas for public agencies long underway in the Bay Area. PG&E publicly supports gas aggregation within its territory.[12]

If CleanPowerSF chooses to offer natural gas commodity service to its customers, it could lower overall energy costs and present an attractive 'value-add' for customers. This would be an opt-in structure similar to programs of School Project for Utility Rate Reduction, an Alameda County based Joint Powers Agency, which provides retail gas through PG&E's pipeline much as power does through its wires.

Regarding existing gas aggregations, the School Project for Utility Rate Reduction (SPURR)[13], in which the San Francisco Unified School District is a member, is an example that LPI's proposed City gas aggregation can use. SPURR describes the advantages it provides as[14]:

- Continuous competition by wholesale suppliers to get the best available prices.
- Private marketers must mark-up the price of gas as high as they can. By contrast, as a JPA, SPURR cannot charge more than our actual supply and operational costs to our program participants.
- Fixed Rates for a portion of our participant's annual usage, to protect participant budgets if market prices rise, as they did in 2005 and 2008. Most participants can select their own level of price protection, or can accept our default levels of Fixed Rates.
- Variable Rates for the remainder of a participant's natural gas usage. The Variable Rate allows participants to take advantage of periods in which spot market prices decline, as in 2009.
- Service to all types of natural gas accounts, including core, non-core, co-generation, and natural gas vehicle accounts.
- No change in participant's access to all CPUC energy conservation programs.

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[12] "PG&Es Core Gas Aggregation Service is an optional service that allows you to purchase gas directly from competitive energy suppliers. Should you choose a competitive gas supplier, PG&E will remain your gas distribution company. Because PG&E does not realize a profit on sales of the gas commodity, PG&E is essentially neutral on your choice of supplier."From a standard PG&E letter presented by the River Delta Unified School District Board of Trustees meeting October 11, 2011. Available online here: [http://www.riverdelta.org/home/riverdeltausd/.blogs/post17908/14%20-%20Res%20653%20SPURR.pdf]

[13] San Francisco Unified School District consumes more gas than any other SPURR member. Presently John W. Bitoff, Executive Director of the San Francisco Unified School District is SPURR's Board Vice President/Clerk.

[14] This list is a summary of the full text, available at: [http://www.spurr.org/]

Mitigations: SPURR provides discounts on gas rates to its members, in part because it can take advantage of changes of the spot market price of gas more flexibly than PG&E whose gas rates are fixed quarterly. They security of its membership is excellent, and SPURR issues revenue bonds.[15] While all members of the aggregation can leave aggregation service, SPURR can recover costs incurred on their behalf if they depart. SPURR employs an opt-out option once a year with 120 days notice, which would create risk for a program focused on local renewables investment rather than merely gas procurement. Participants may opt to leave the SPURR gas aggregation program on any July 1 if they provide sufficient notice to SPURR. In effect, although they enter into multi-year contracts with SPURR for gas aggregation and related services, participants may nevertheless exit the program on 120 days notice prior to the start of the next fiscal year. CleanPowerSF could investigate setting up a similar program for its customer base.

[15] No SPURR member participating district has ever defaulted on its gas bill; nor has any payee not been paid."These and other statements about SPURR are found in the "Preliminary Official Statement" concerning revenue bonds prepared in 2011 by their underwriter. http://munibase.elabra.com/SPURR11FOS/doc/fos.pdf