Picking Up the Pace with the San Francisco Building Retrofit Program: EECBG Retrofits at Lightning Speed while Stretching Funding

Christine Vance and Terry O'Sullivan, City and County of San Francisco,
Abhijit Rao, EnerNOC, Inc.

ABSTRACT

This paper describes an innovative energy efficiency project delivery system and its successful application to San Francisco's Energy Efficiency and Conservation Block Grant (EECBG) municipal retrofit program. The San Francisco Building Retrofit Program represents a revolutionary approach to how public agencies audit, design and retrofit buildings, with the aim of accelerating building retrofits to combat climate change. Building on this model, the EECBG program completed $3.6 million in comprehensive lighting and HVAC retrofits at 10 key community-serving buildings. The program model enabled the City to complete projects at a pace that exceeded federal stimulus funding requirements, condensing the full project cycle down to 7-to-12 months. Also, cost efficiencies allowed for additional retrofits that increased energy savings and climate benefits by approximately 60% compared to the City's conventional project delivery method. Keys to the program's success included unit pricing through "job order contracting," green-specialty trade contracting, and an integrated design approach. The program structure helped to establish a circle of trust between the City's project managers, consultants, and contractors. This collaborative approach allowed the City to leverage consultants' energy efficiency expertise, and contractors' knowledge of constructability, to conceptualize and execute the projects rapidly and cost-effectively. Standardized procedures and templates allowed the team to quickly navigate through documentation requirements while maintaining high quality assurance. The program model has been recognized for its effective administration and satisfied customers. This paper presents program design elements that are transferable and scalable to other agencies as well as to a wider state or regional setting.

Introduction

Beginning in 2009, thousands of government agencies received Recovery Act awards from the US Department of Energy as part of the newly funded Energy Efficiency and Conservation Block Grant (EECBG) program. These agencies then immediately faced the challenge of how to devise project delivery mechanisms that met the federal government's aggressive schedule and spending goals, in order to create jobs and stimulate the economy. The predicament faced by these local governments illustrate the larger challenge for "scaling up" energy efficiency efforts nationwide. That is, to increase project through-put and significantly impact climate change, the energy efficiency industry must go beyond making incremental improvements to existing project delivery systems. Generally, and for local government in particular, the industry must innovate with revolutionary new approaches that fundamentally change how buildings are audited, designed and retrofitted. Delivering energy projects in the public sector requires not just the usual custom construction challenges of building retrofits - it also requires myriad burdensome procurement steps, in most cases including competitive

bidding.[1] EECBG was a case in point. Staff's contact with other grant recipients suggests public procurement was a key challenge to meeting DOE's spending and implementation goals.

"The San Francisco Retrofit Program," as demonstrated by the EECBG retrofit projects, provides one answer to this challenge through a new approach to government-procured energy retrofit projects. The City, through its Public Utilities Commission's Power Enterprise,[2] began developing the San Francisco Retrofit Program in 2008. The program model features flexibility, rapid response, transparency, competitive bidding, quality control, and the ability to stretch funding. These advantages are achieved through a strategic application of: Job Order Contracting (JOC), direct trade contracting, and an integrated design approach.[3] These elements are described below. City staff reported on program development efforts to date in 2010 (Vance, O'Sullivan & Kramer 2010). A formal performance audit of the program found very high ratings from customers both for overall satisfaction and for effective administration (City and County of San Francisco's Controller's Office 2011).

Since 2009, City energy efficiency staff have used this new program model to successfully implement $12.7 million in energy retrofit projects in more than 80 of San Francisco's largest municipal buildings. Staff expect to complete another $6.6 million in energy retrofits at more than 20 sites in the next 12 months. Departments and sites are selected and prioritized for services based upon their total annual energy costs. Projects tend toward deep retrofits comprised of a comprehensive package of energy efficiency measures that meet an overall payback period of 15 years or less. Typical projects range from fire station lighting retrofits to substantial central plant and HVAC upgrades at Davies Symphony Hall.

By building on the program's structure and "off-the-shelf" templates, the authors believe other local agencies can realize results that are similar to or better than those achieved by San Francisco. San Francisco's program design for implementing energy efficiency retrofits is in the public domain and is transferable. The program's flexibility, cost savings, and transparency are ideally matched to the post-ARRA era of reduced funding from more diverse sources.

Beyond adoption by a single agency, the authors believe the program could be scaled to serve multiple agencies at a regional or state level. Regional collaborations have begun to emerge as a means to overcome the inefficiencies of duplicative procurement processes by multiple local agencies engaged in similar projects. The authors believe that regional procurement of as-needed turnkey energy retrofit services for use by local governments could unleash significant energy retrofit activity, and that the San Francisco Retrofit Program model offers a structure that makes this concept viable.

EECBG Projects Demonstrate Merit of the San Francisco Retrofit Program

In 2009, the City and County of San Francisco received $7.7 million in EECBG funding. The City's Power Enterprise administered the grant. City administrators targeted $3 million for energy retrofits in City-owned facilities, with remaining funds supporting residential energy

[1] The biggest challenge faced by ABAG's Local Government Energy Partnership Program, serving over 70 local governments in California was "overcoming the barriers and bridging the gap between project development and project implementation/completion" (Chamberlain, Lahr & Nushwat 2008).

[2] Power Enterprise is City of San Francisco's municipal utility and the lead agency responsible for providing energy-efficiency services to municipal customers across 40 City and County agencies.

[3] For this paper, "integrated design approach" refers to the collaboration between contractors and engineers during the entire project cycle, as opposed to their more compartmentalized roles when utilizing design-bid-build.

efficiency programs as well as development of a commercial sector PACE financing pilot program. For the EECBG program's municipal retrofits, energy efficiency staff built from the San Francisco Retrofit Program's structure, including using its consultant contracts.

The EECBG Municipal Retrofit Program's main objectives were: 1) to invest federal funds quickly in order to stimulate the local economy and to meet aggressive federal spending milestones; and 2) to provide high quality, deep facility upgrades at important community facilities to achieve energy reductions and lasting cost savings.

San Francisco's EECBG program provided the full "turn-key" energy retrofit services. Project management was provided by City energy efficiency staff; energy audits, retrofit design, construction management support, commissioning and measurement and verification (M&V) services were provided by three energy consulting teams (one specializing in lighting, one in HVAC, and one performing M&V); and construction was performed by four Job Order Contractors (two lighting, and two HVAC).[4]

The Mayor's Office and its Capital Planning Committee had previously selected the 10 EECBG facilities based on an intersection of capital needs and community importance. (As such, the sites provide a relatively random and representative sample of public facilities, ideal for demonstrating the program model's broad applicability.) The EECBG program implemented a broad range of energy retrofits for these facilities. Lighting retrofits included T12-to-T8, HID-to-T8, and T8-to-T8 fluorescent conversions, as well as occupancy controls. High lumen lamps and high output ballasts facilitated de-lamping in order to achieve large savings. HVAC projects included major capital upgrades such as replacing three boilers and six rooftop air handling units; converting two health centers to variable air volume, and re-installing outside air economizers. Controls upgrades ranged from programmable thermostats, to art gallery lighting controls, to full building energy management systems.

Results

In FY 2010-2011, the City completed 17 energy retrofit projects in 10 municipal buildings as part of the EECBG program. Total program costs were $3.6 million, of which $3 million was from the EECBG grant. (Power Enterprise funded the program's consulting services.) These lighting and HVAC projects made improvements to three neighborhood health centers that provide free or low-cost healthcare services, three cultural centers that promote the arts and youth development, three Sheriff's Department facilities, and a neighborhood community center.

Other important program results included the generation of over 12,000 hours of work for regional construction firms, with the on-site participation of 77 construction workers, and estimated annual energy savings of 1,200,000 kWh of electricity and 90,000 therms of natural gas. These upgrades are expected to decrease annual utility costs by $197,000 at current energy prices and to promote better environmental stewardship for the City's municipal facilities by reducing greenhouse gas emissions by 1,063 metric tons of eCO_2 / yr.

[4] One benefit of the program model is its ability to spread the work to multiple contractors. The JOC bidding process allows procurement of a pool of contractors for "as-needed" construction, whereas the City would typically bid out work of this scale to a single general contractor or perhaps one mechanical and one electrical.

Cost Efficiencies Yield Greater Energy Savings

Prior to applying the San Francisco Retrofit Program model to these projects, the EECBG program was to be implemented by the City's Department of Public Works (DPW) engineering bureau, using the City's typical design-bid-build procurement approach. DPW's $4 million proposal (which was rejected) would have covered HVAC-only scopes in four of the ten targeted facilities.[5] Thus, the City's typical project delivery method would have required extra grant funds, while skipping over nine lighting retrofits, and leaving six of the ten facilities with no upgrades at all. By instead delivering the projects based on the San Francisco Retrofit Program model, all ten sites received retrofits, and savings and climate benefits were increased by approximately 60 percent.

Table 1: EECBG Project Summary (10 Sites - 17 lighting and HVAC Projects)

Project Site	Total Costs	Annual Electricity Savings (kWh)	Annual Gas Savings (therms)	GHG Reductions - US DOE (metric tons eCO2 / yr)	In Orginal Design-Bid-Build Scope?
County Jails #1 & #2 HVAC	$ 810,795	632,412	65,606	659	Yes
Southeast Health Center (Lighting and HVAC)	$ 868,790	93,416	4,216	68	HVAC Only
Ocean Park Health Center (Lighting and HVAC)	$ 506,068	60,946	9,008	78	HVAC Only
Chinatown Health Center (Lighting and HVAC)	$ 217,573	32,507	2,893	31	Different HVAC Scope No Lighting
County Jail #6 Lighting	$ 147,360	162,787	-	80	No
Women's Reentry Center Lighting	$ 32,125	3,789	-	2	No
African American Art & Culture Complex (Lighting and HVAC)	$ 180,181	42,168	516	23	No
Mission Cultural Center for Latino Arts (Lighting and HVAC)	$ 399,993	35,508	629	21	No
SOMArts Cultural Center (Lighting and HVAC)	$ 195,376	51,244	396	27	No
Ella Hill Hutch Community Center (Lighting and HVAC)	$ 196,576	74,917	7,010	74	No
TOTALS	**$ 3,554,837**	**1,189,695**	**90,274**	**1,063**	

Source: San Francisco PUC Power Enterprise/ Energy Efficiency Services, 2012

Accelerated Project Delivery

Overall, the EECBG program compressed the audit-through-construction project cycle down to seven months for lighting projects, and twelve months for HVAC projects. A key difference was the time for design-bid-award steps which, in San Francisco, typically take at least ten months (and often longer). The program accomplished audit-design-bid & award *in four months*. (See Figure 1.)[6] These savings allowed the program to greatly exceed the US Department of Energy's voluntary 20% spending goal by September 2010.

[5] In a memorandum dated April 23, 2010, Gary Oto, Manager of Energy Efficiency Services, advised Maurice Chee, DPW Supervisor of Mechanical Engineering, about the reasons for choosing SFPUC JOC contracts. Analysis of data from this memorandum excludes Chinatown Health Center since the two scopes are not identical.

[6] "Traditional" design-bid-build project durations, used for comparison in the figure, are derived from extensive staff experience with City of San Francisco; "typical" for other jurisdictions may be shorter – both for traditional and for JOC-based procurements.

Figure 1. Comparing the EECBG Project Schedules to the Traditional "Design-Bid-Build"

	Audit	Design	Bid/Award	Construction		Total
EECBG Lighting	1 month	1 to 2 months	1 month	3 to 4 months		7 to 9 months
EECBG HVAC	1 to 2 months	1 to 2 months	1 to 2 months	5 to 8 months		10 to 12 months
Design-Bid-Build	2 to 3 months	4 to 6 months	6 to 8 months	6 to 10 months		18 to 32 months

Source: San Francisco PUC Power Enterprise/ Energy Efficiency Services, 2012

Four Key Innovations of This Program

The San Francisco Retrofit Program, as illustrated by the City's EECBG program success, integrates four major innovations, each yielding important benefits:

1.) Applying "Job Order Contracting" to Energy Retrofits, to Gain the Benefits of As-Needed Construction, Unit Prices and Speedy Project Delivery

A Job Order Contract (JOC) is a competitively bid, firm fixed-price, indefinite quantity contract between a facility owner and a construction contractor. With Job Order Contracting, contractors bid a mark-up that is applied to a catalog of detailed construction tasks with pre-set unit prices and specifications (referred to as a "Construction Task Catalog" or CTC). The contractor that meets minimum qualification and bids the lowest mark-up is awarded the contract. When projects are identified, the contractor is issued a scope of work; s/he breaks down the work into CTC-listed tasks, and prepares a cost proposal based on the CTC unit prices, quantities and the mark-up. Project managers review the proposal, and when satisfied, issue a task order, resulting in a notice to proceed within a few weeks.

Unit pricing under JOC provides greater cost certainty and cost controls since contractors are contractually held to prices in the CTC, and engineers use the same catalog during the audit and design phases to estimate project costs. As such, the risk of unexpected contractor pricing is low. The catalog also offers cost control (and promotes teamwork) by eliminating contentious change order negotiations; changes are simply priced from the JOC catalog. With the design-bid-build procurement approach, costs are not known until the end of a lengthy, often unpredictable bid process, and change orders pose a serious risk to project costs.

JOCs help speed project delivery by establishing one (or more) multi-year construction contract(s) through a single, simple bidding process, instead of repeating bidding for each project. The JOCs are then available on-call to quickly execute projects as each one is developed. With design-bid-build, every project, no matter how small, requires complete design documents and a lengthy RFP process. In contrast, for San Francisco's program model, detailed design is replaced by performance-based technical specifications that dictate the quality of workmanship and materials; thus design takes a few weeks versus many months with design-bid-build. Delivery speed also improves because project development can happen in parallel with the JOC bidding process. Construction is accelerated as well, since the design-build collaborative process for the engineers and contractors replaces cumbersome RFI and change-order processes. Finally, the model allows overlapping of audit-&-design and design-&-construction phases.

2) Customizing the Construction Task Catalogs for Lighting or HVAC Retrofit Projects, and Utilizing Green-Specialist Trade Contracting

An essential element to this program's success is utilizing customized energy efficiency (EE) JOC catalogs rather than general contractor catalogs, along with contracting directly with EE-specialist lighting and mechanical trade contractors. To facilitate "trade contracting," the City sponsored a collaboration of EE experts and its JOC service provider, The Gordian Group, to create the first-ever customized CTCs for a single EE trade (one for lighting, one for HVAC). These custom EE-trade catalogs:

a) Narrowed the CTC to only those tasks related to EE retrofit work within the given trade[7];
b) Added EE equipment and tasks not found in the general construction catalog such as emerging lighting technologies or retrocommissioning tasks; and
c) Grouped materials and tasks into "assemblies" of common EE retrofits with one unit price.[8]

Advantages of this "green-specialist" trade contracting model are:

- Cost savings. Trade contracting eliminates a general contractor's mark-up on mechanical or electrical subcontractors who perform the majority of the work for energy retrofit projects.
- Higher quality contractors. This procurement strategy uses bidder minimum qualifications to ensure high quality electrical and mechanical firms with specialty EE experience are hired.
- More suited for EE retrofits. The EE-customized CTCs provide an exhaustive list of EE tasks that can be used to price out virtually any EE retrofit. Also, any EE measure not in the CTC can be added as a "non pre-priced" item and paid for "at cost" plus a pre-agreed mark-up.

San Francisco's innovations address JOC shortcomings for EE retrofits. JOC contracting alone is not a panacea. San Francisco and (anecdotally) other jurisdictions have found using a general contractor JOC and task catalog to be poorly suited for EE retrofits. Shortcomings of general contractor JOCs for EE retrofit include:

- No direct control over selection or management of the mechanical and electrical subs;
- Little control over qualifications of a general contractor's mechanical and electrical subs; and
- A "general construction" task catalog that is missing many EE tasks and specifications.

Fortunately, these shortcomings can be successfully addressed through using customized lighting and HVAC EE JOC catalogs along with trade contracting, as discussed above.

[7] Catalogs for general contractors are enormous documents covering a vast range of construction tasks across all construction trades.

[8] An assembly might include all of the required materials for a specific lighting fixture replacement measure whereas in the general contractor CTC one must separately select each item (even the nuts, bolts, wiring, etc.). EE task assemblies facilitate greater ease in creating and reviewing JOC cost proposals.

3) Bundling Consultant Services to Provide Continuity and Flexibility

Since the 1990s San Francisco has been procuring its EE consulting services within single contracts that provide the full range of energy audits, design, construction management support, (A-D-CM), commissioning and measurement and verification. For the San Francisco Retrofit Program model, this contract structure allows for continuous engagement by a single consulting team throughout a project life. Thus the designer correctly interprets the audit recommendations, and the construction manager is aware of the engineer's design intent. Accumulated experience suggests that structuring the program to use bundled A-D-CM consulting: improves quality through reduced errors and better communication; provides flexibility such as pre-design efforts during the audit; reduces change-management costs; relieves demands on staff; and promotes accountability instead of finger-pointing.

4) Using Document Templates, Program Procedures and Integrated Design to Gain Speed, Cost-Efficiencies, Quality Control, and Partnership

The program improves cost-efficiency and quality by using a streamlined process and standardized documents. These templates and procedures allow the project team to quickly navigate through documentation requirements while maintaining a high level of quality assurance. Experienced engineers and contractors, having used these tools for dozens of energy retrofits attest to their usefulness.

The program's integrated design approach likewise promotes efficiency and quality, as well as partnership. In a typical design process, the engineering team develops a design package that may be technically sound, but may be lacking in terms of constructability and ease of maintenance. The reason is that contractors do not become involved in the design process – especially in the case of low-bid public construction. For the San Francisco Retrofit Program, staff directs consultants to engage the contractor during the audit and early design stages for input about constructability and costs of EE measures. This early collaboration, along with neutralizing conflict over change-orders, and other program structures all help staff to establish a circle of trust between the consultants, the contractors and themselves.

The program's compressed design schedule is made possible by this collaboration, along with use of performance specifications. Final designs are completed by the JOC contractor in a design-build-like process. Potential downsides of this model, like any design-build, are that project success is more dependent on the design capabilities of the contractor, and on the design engineer's experience in writing performance specs. Thus, team qualifications are key. On the other hand, simply going fast during design could increase the risk of missed design opportunities if that speed were not be accompanied by integrated audit-design steps, early contractor input, and other elements used by the San Francisco model.

Summary of Advantages of San Francisco's Building Retrofit Program:

- Speedy delivery – once the streamlined design is complete, construction can begin within weeks;
- Administrative efficiency with a simpler RFP and master contract, and no repeated bids;
- Competitive pricing, cost certainty and control;
- Greater teamwork and collaboration;

- High quality contractors with an incentive to perform well since only a minimum value of work is guaranteed;
- Suitability for multiple and diverse funding sources in the post-Recovery Act era since JOC is modular and transparent;
- Flexibility of as-needed contractors to perform mock ups and pilot projects, and to phase in retrofit projects over time as developed (thus realizing energy savings benefits sooner);
- Costs savings due to the following efficiencies:
  - Lower procurement costs by eliminating the need to separately bid each project;
  - Reduced project management and CM costs due to the speedy project delivery;
  - Less risk of inflated costs for change orders (and litigation costs from claims) since added work is priced from the catalog;
  - Design cost savings form performance specifications versus full design drawings.
  - No mark-ups by general contractors on mechanical and electrical subcontractor work on energy retrofits by using customized JOC catalogs and trade contracting;
- Measurable and persistent savings through M&V tailored to funding source requirements.

Notes from the Field: *For the EECBG program in particular, the consultants were able to deliver the energy audits in an extremely condensed time frame because they had developed standardized calculation templates for estimating energy savings of EE measures beforehand. The program manual provided standard report templates to the consultants that allowed them to develop professional and attractive reports and present their findings to the project team with minimal effort. The consultants used the JOC task catalog develop the budgetary cost estimates for the audits. Normally, this process involves a time-consuming interaction with vendors to obtain quotes resulting in a long timeframe for delivering audits.*

How to Replicate the Program for a Single Agency

The following describes steps an agency could take to replicate the San Francisco Retrofit Program:

Step 1) Dedicate In-House Staff for Program Oversight and Project Management

Dedicate in-house staff to procure and establish the professional services contracts and JOC construction services, and to perform program management and project management tasks. Program management includes establishing the program's key objectives and policies, and customizing the procedures and templates in accordance with the local agency. Program management activities include budget and staff planning, assignments for consultants and for JOC contractors.

Step 2) Establish As-Needed Contracts that Bundle Audit/Design/CM Services

Issue an RFP for energy engineering services that bundles audit, design and construction management services under one as-needed contract to provide continuity in the delivery of engineering services.

Partnership. Consultants are active partners with the project manager, rather than mere role players in the project. Consultants engage with project site staff, perform energy audits, identify project risks, dissect JOC contractors' price proposals and review their designs, help problem-solve throughout construction, and verify the retrofit measures are installed per the design intent.

Key qualifications. The consultant team must have: 1) prior expertise developing and managing energy efficiency projects from audit-through-construction; 2) strong experience in energy auditing and in developing design performance specifications (for design-build projects).

Additional services to consider. The consultant team should include on-call specialist firms e.g., hazardous materials consulting. Finally, agencies should include measurement and verification (M&V) services geared to the requirements of the program stakeholders.

Step 3) Engage JOC Consulting Services to Establish and Support JOC Contracts

Consider contracting with a JOC consulting firm to help set up JOC contracts. In San Francisco's case, program staff, working with City contract/procurement staff, engaged The Gordian Group for these services. The firm developed a customized catalog of construction tasks and technical specifications with pricing for the Program's geographical area (including application of prevailing wage laws); they also helped create a contract with general conditions tailored to the specific needs of the agency and program. A JOC consulting firm may also train agency staff and contractors on JOC contracting procedures, and provide on-going technical support. Fee structures are variable. For the EECBG program, The Gordian Group's compensation was a fixed percentage of the construction cost of approved task orders.

Step 4) Establish a Pool of Lighting and HVAC JOCs for Efficiency Retrofit Services

Advertise, competitively bid, and award JOC contracts to two or more electrical contractors to perform lighting efficiency retrofits. Lighting retrofit projects are a good way for an agency to become familiar with the JOC process. Subsequently (or simultaneously) award JOC contracts with two or more mechanical JOC contractors to perform HVAC efficiency retrofits. Build off the City's (public domain) lighting and HVAC JOC catalogs developed by The Gordian Group by customizing the catalogs for local labor and materials pricing, and for local contract terms.

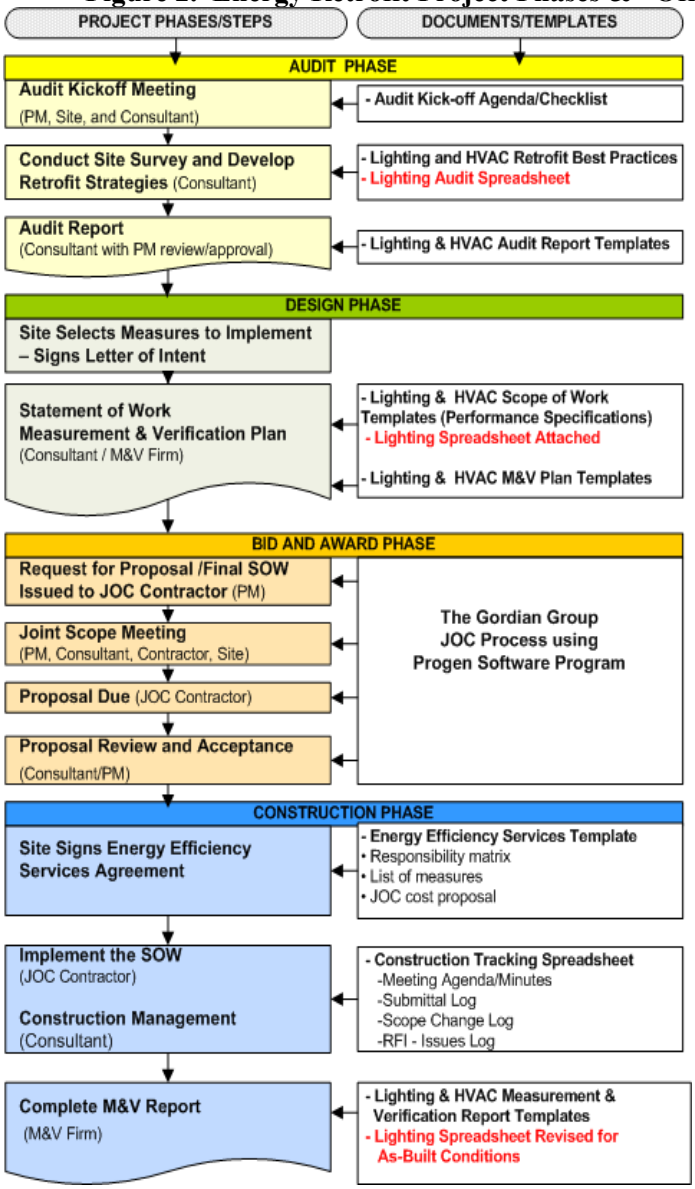
Key qualifications. To insure the electrical and mechanical bidders have the necessary specialized energy retrofit expertise, insist on appropriate minimum qualifications and experience by bidders, as well as strong experience by the main project manager. Electrical contractors should be required to document five years of lighting efficiency experience with more than 50% of the work begin lighting efficiency-related. Mechanical contractors should be

asked to document seven years of experience in EE retrofits, including experience with a specific range of system retrofits and with a variety of building control systems.

Step 5) Utilize "Off-the-Shelf" Standard Procedures, Documents, and Streamlined Tools

To guide consultant teams and streamline project delivery, the City's program team established many standard policies, procedures, best practices and document templates. Examples include a detailed policy for cost effectiveness, and lighting and HVAC retrofit equipment standards and best practices guides. All of these "off-the-shelf" documents are available in the public domain and could be customized easily for use by another agency. Figure 2 illustrates some document templates used in the San Francisco Retrofit Program.

Figure 2. Energy Retrofit Project Phases & "Off the Shelf" Documents and Templates



***Streamlined Templates**: Figure 2 illustrates how standard documents and templates are applied in the San Francisco Retrofit Program to streamline project delivery. Human error is reduced by building on the same spreadsheets and documents through sequential phases.*

The room-by-room lighting audit Excel spreadsheet standardizes assumptions across various retrofits; the Excel table then becomes an attachment to the JOC scope of work; the Construction Manager then uses the table to verify the JOC contactor's daily work and requests for progress payments as portions of the project are completed; the same spreadsheet is used as the starting point for documenting final as-built conditions. Another feature of the spreadsheet is that it automatically calculates the total lamps and ballasts from the auditor's room by room records, making it much easier for the Project Manager to review the JOC contractor's unit pricing proposal and volume discounts. The templates and forms are maintained on a shared FTP site and can be updated as needed.

Source: San Francisco PUC Power Enterprise/ Energy Efficiency Services, 2012

Replicating This Program Design on a Regional or State Level

The San Francisco Retrofit Program could be replicated and expanded to a wider regional or state level. Such an application would allow multiple agencies access to as-needed, turnkey energy retrofit services, thereby overcoming high administrative barriers to public sector energy retrofits. In California and elsewhere, significant precedents exist for using group-purchasing methods to procure products and services for local and state agencies. For example, local agencies can purchase many commodities (including natural gas) through state-government procurement contracts. A review of the literature revealed many recent examples of successful regional purchasing cooperatives or collaborative initiatives.[9] The authors did not locate examples of regional purchasing initiatives being used for energy efficiency retrofit services in the government or commercial sectors.

Potential Regional/State Level Program Structures

The key players in a regional or state program would be similar to the single agency model discussed earlier. In this case, however, the ***Program Participants*** would be cities, counties, school districts, and other public agencies. Program Participants would enter into a Joint Powers Agreement (JPA) with the Administering Agency to receive turnkey retrofit services, including project management, audit, design, and construction management, and construction by lighting and HVAC JOCs. The key service providers for the program would be as follows:

- **Administering Agency:** A state energy office, a regional agency, or single local agency, acting as the Administering Agency must have the authority to enter into contracts with the other key players listed below.[10] Program Participants would enter into a JPA with the Administering Agency to receive program services.
- **Program and Project Management Services:** A consultant, nonprofit, or potentially staff from the Administering Agency would: 1) help the Administering Agency procure a pool of pre-qualified consultants and JOC contractors to implement projects; and 2) modify San Francisco's procedures and templates to suit the Agency's needs and objectives for the program. This service provider also would provide project management services for each project to ensure oversight of consultants' and contractors' work.
- **Pre-Qualified Energy Engineering Services:** At least one team (depending on program scale) would provide audit, design and construction management services**.**
- **JOC Consulting Services:** The Administering Agency would contract with a JOC Services provider to provide JOC contracts tailored to the specific requirements of the Agency, and JOC catalogs customized for lighting and HVAC retrofits, and updated for local pricing.
- **Pool of Lighting JOC Contractors and Pool of HVAC JOC Contractors:** With assistance from the Program Management service provider, the Administering Agency

[9] Examples range from solar group-procurements by Sonoma, Alameda and Santa Clara Counties in California, to Alameda's Energy Upgrade California residential program, to low income housing EE by Chicago Area Energy Savers and Portland Energy Works, to Connecticut's Capitol Region Council of Governments' shared JOC program.
[10] Any of these entities also could be acting as a utility "third party program administrator."

would award competitively-bid JOC construction contracts. The bidding should be consistent with the most stringent expected Public Contracting code requirements for construction contracts.

How to Start Small – JOC Contracts through National Joint Powers Alliance (NJPA)

Options exist for a regional agency (or even one or more local governments) to start a regional program with relatively few set-up steps, and then add more energy engineering teams and JOC capacity as demand for services grows. In this scenario, a local government program participant could access existing JOC contracts (rather than procuring their own contracts) by establishing a JPA with the National Joint Powers Alliance (NJPA). The NJPA is a national service cooperative created by the Minnesota Statute 123A.21. The Gordian Group's EZIQC (easy indefinite quantity construction contract) program has worked with NJPA to establish general construction JOC contracts in various regions in the U.S.; these contracts may be accessed by any local agency that is a member of NJPA and enters into a JPA for services. The strategy contemplated here is that this EZIQC program would respond to local agencies' requests to set up specialized lighting and HVAC JOC contracts for a particular state or region. In this scenario, NJPA, in conjunction with the Gordian Group, would advertise and award competitively bid lighting and HVAC JOC construction contracts based upon regional pricing updates to the task catalogs developed for the San Francisco Retrofit Program. Once the master lighting and HVAC JOC contracts are awarded, local government NJPA members could implement individual projects by issuing a purchase order against the master contract.

On a pilot program basis within California, these easy-access lighting and HVAC JOC construction contracts available through the NJPA could be paired with the necessary energy engineering and project management services from the following sources:

- California Energy Commission-hired energy consultants for the Energy Partnership Program;
- A regional agency that provides local agencies with access to energy consultants, or a utility third party provider that provides free EE project development services to local governments;
- An EE engineering firm or nonprofit providing services to clients under its normal contracts.

In each case, consultants performing energy audits could direct their public sector clients to the NJPA JOC contracts to speed implementation, while offering project management services. Ideally these strategies could be linked to funding through the California Energy Commission's loan program.

Conclusion

San Francisco's EECBG Municipal Retrofit Program provides a powerful demonstration of the ability of the San Francisco Retrofit Program to accelerate public building energy retrofits while stretching funding. This paper provides guidance to help additional public agencies adapt this model to suit local needs.

Key program elements that are critical for achieving similar success include green-specialty trade contracting along with customized EE JOC catalogs, and an integrated design approach. These elements combine to provide a local agency with as-needed construction services by qualified contractors, working collaboratively with energy efficiency consultants to conceptualize and execute energy retrofit projects rapidly and cost-effectively.

Creating a regional version of the program would provide dozens of local agencies with easy access to flexible, on-call, turnkey energy retrofit services. This change could make it possible to achieve the scale and volume of public building energy savings necessary to make a real impact on climate change. The authors' experience is that public buildings are an otherwise rich source of energy savings, with their heavy use and publicly motivated, long-term institutional owners. Regional collaboration could help local agencies realize their potential to provide both local and global benefit. Agencies interested in obtaining copies of templates and other program materials are encouraged to contact the authors at cvance@sfwater.org.

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