

Coast to Coast: Piloting Multifamily Retrofit Program Delivery Models from the New York Empire to the Golden State

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ABSTRACT

Until recently, whole-building retrofit programs that specifically addressed the multifamily building sector were scarce. Multifamily programs typically are split between residential and commercial program delivery models, where tenant-occupied living spaces are treated as residential (single-family focused), and central systems and common areas are treated as commercial. This approach requires property owners to participate in two separate programs and deters a whole-building approach. Largely due to American Recovery and Reinvestment Act (ARRA) funding and other policy initiatives this trend is shifting, with a recent burst of program activity directed specifically at this sector. The shift resulted in the development of whole-building infrastructure aimed at reaching the wide variety of multifamily building types, ownership and financing structures, tenant populations, and system configurations.

This paper examines program delivery strategies in three primary areas: 1) service delivery (who performs the work), 2) incentive delivery (how incentives are structured and payment is timed, to whom, and the resulting participation, energy savings, and retention), and 3) leveraged efforts (coordination of whole-building with other direct install or weatherization programs). Looking through the lens of two statewide programs: 1) Energy Upgrade California™ – Multifamily (EUC), an ARRA-funded program administered statewide by the State Energy Program (SEP) and regionally by local agencies, and 2) the Multifamily Performance Program (MPP), a ratepayer funded program administered by New York State Energy Research and Development Authority (NYSERDA). The paper presents similarities, differences, and lessons learned from the various delivery strategies of these retrofit programs.

Multifamily Program Overview

The delivery strategies discussed in this paper are presented through whole-building multifamily retrofit programs in the states of New York and California, as introduced in Table 1.

Table 1. Overview of New York and California Multifamily Retrofit Programs

	NY (NYSERDA MPP)	CA (EUC Sacramento)	CA (EUC San Diego)
Funding Source	Rate-payer & RGGI ¹	ARRA	ARRA & Rate-payer
Timeframe	2007 to present	December 2010 to March 2012	March 2011 to May 2012
Qualification Criteria	5+ attached units	5+ units (per property)	5+ attached units
Affordable Component	Higher incentive ²	NA	Higher incentive ³

¹ Regional Greenhouse Gas Initiative (RGGI)

² At least 50 percent of tenants make at least 80 percent of the Average Median Income (AMI) of New York

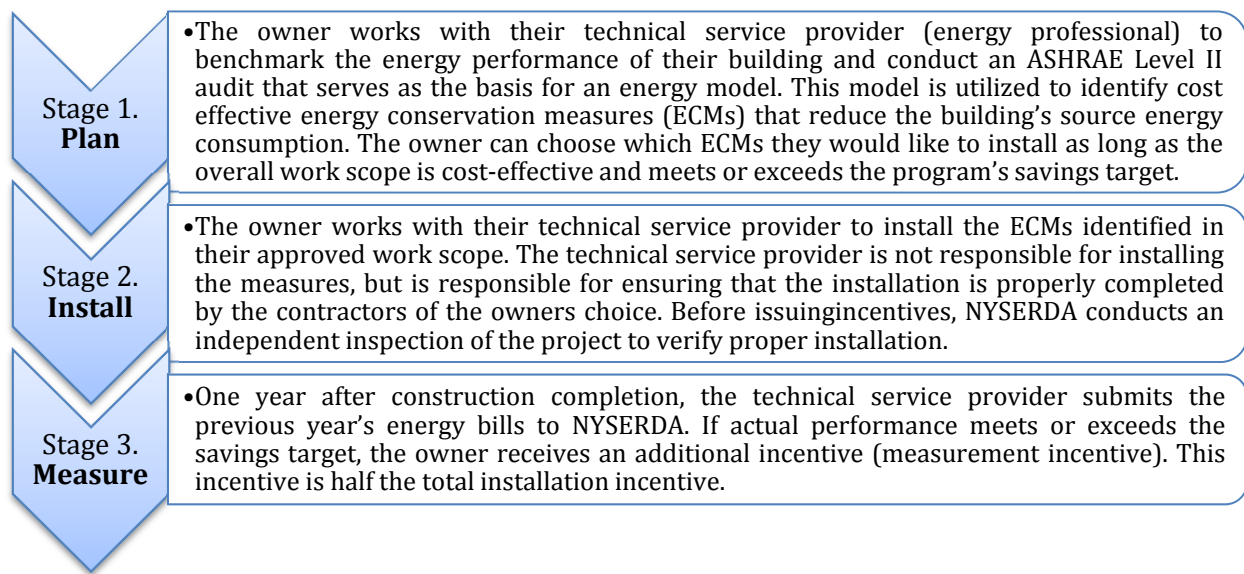
³ At least 15 percent of tenants make at least 400 percent of the Federal Poverty Level (FPL)

NYSERDA Multifamily Performance Program

The New York State Energy Research and Development Agency (NYSERDA) Multifamily Performance Program (MPP) is a whole-building, energy efficiency program that challenges multifamily owners to reduce total source energy consumption by 15 percent. The program addresses buildings with 5 or more units and serves both the new construction and existing building sectors. For purposes of this paper, only the existing building component is discussed. Launched in 2007, MPP is funded by New York State's Systems Benefit Charge (SBC). The program consolidates several disparate multifamily-sector programs run by NYSERDA since the late 1990's to a single-point-of-entry for all multifamily building types. The program uses a standardized process, a straightforward incentive schedule based on building size, and a market-based approach to service delivery. To date, 560 buildings consisting of more than 100,000 units, have participated in the program (approximately 5 percent of the market).

Process. Properties participating in MPP follow a three-stage process (see Figure 1 below).

Figure 1. Multifamily Performance Program (MPP) Process



MPP has evolved over time based on experience; however, the fundamental structure remains the same. Between 2007 and 2009, three updated versions of the program were released, resulting in process and technical documentation improvements. In 2009, the program's source of rate-payer funding changed from SBC to the Energy Efficiency Portfolio Standard and the savings target was reduced (from 20 to 15 percent). The latest version is launching in July 2012.

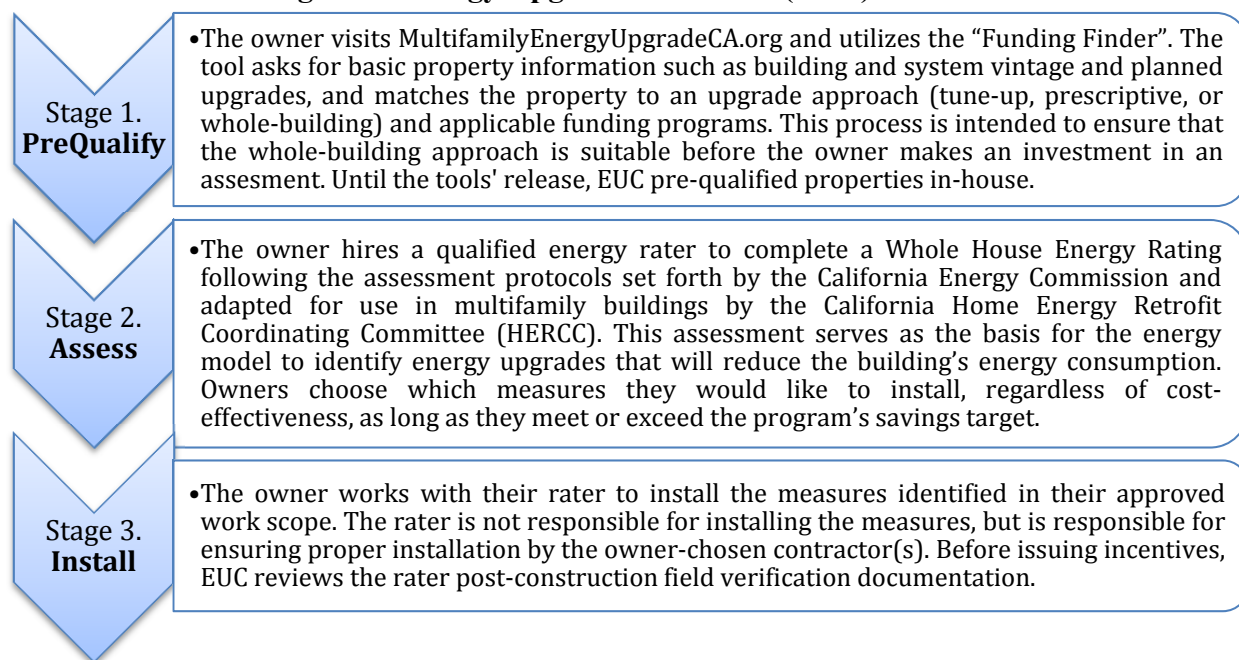
Energy Upgrade California™ - Multifamily Program, Sacramento and San Diego Counties

Energy Upgrade California™ (EUC) is a statewide residential program targeting the single- and multifamily existing building sector. The program began in 2010, with multifamily starting in 2011, at phase II of implementation. The EUC brand is conceptualized under the California Energy Commission's (CEC) State Energy Program (SEP), a stimulus-funded

initiative through the 2008 American Recovery and Reinvestment Act (ARRA). In the first program cycle, funded largely by ARRA, the program is designed to primarily create training and job opportunities for the hard hit building industry. Secondly, the program develops an infrastructure (standards and tools) and introduces the market to whole-building energy and green improvements, financing, and certifications. Lastly, the program aims to save energy.

Process. Properties participating in EUC follow a three-stage process (see Figure 2 below).

Figure 2. Energy Upgrade California (EUC) Process



While EUC multifamily programs have underlying consistency, statewide, regional differences impact the delivery of each program. Multifamily programs are currently active in five California jurisdictions: Alameda, Los Angeles, Sacramento, and San Diego Counties as well as the City of San Francisco. Each of these programs share a common framework penned by the Multifamily Subcommittee of the California Home Energy Retrofit Coordinating Committee (HERCC 2011). Each region, however, has slightly different eligibility criteria, minimum performance thresholds, and training requirements. This paper focuses on Sacramento and San Diego County efforts, whose programs are well into, or have completed their pilot phases.

Sacramento County. EUC in Sacramento County, administered by the Sacramento Municipal Utility District (SMUD), Known as the Home Performance Program – Multi-Family, the program encourages whole-building energy upgrades that result in a minimum 20 percent improvement in predicted (modeled) energy usage over existing conditions, with weighting for time-of-use (TDV⁴). Properties must contain a minimum of five (5) units and are qualified at a property level (i.e. multiple duplexes, triplexes, and quadplexes on a single parcel qualify). Participants must

⁴ Time-Dependent Valuation (TDV) weights value of electricity differs based on time-of-use (hourly, daily, seasonal), and the value of natural gas based on season, encouraging reduction of energy during peak hours.

adhere to ARRA requirements, including: California Prevailing Wage and federal Davis Bacon Act requirements, waste management, historic properties, and Buy American (CEC 2010). The generous incentives from \$2,300 to \$3,800 per dwelling unit help to offset the costs of meeting these requirements and motivate owners to fast-track upgrades within the short program timeframe. The program retrofitted 2,513 multifamily units (48 properties) and assessed 11,289 multifamily units (129 properties) between April 2011 and March 2012. Due to limited ARRA-funding, the program provided construction incentives to 2,513 units, though an additional 8,776 units received energy assessments. These remaining units have been rolled over to the subsequent ratepayer-funded program cycle.

San Diego County. EUC in San Diego County is a partnership between the City and County of San Diego, the City of Chula Vista (ARRA-funded), and San Diego Gas and Electric (ratepayer-funded). Coordinated program participation is essential to the success of the program, but also resulted in a long list of program requirements (i.e. health and safety, waste management, Buy American, etc.). In San Diego, the owner and HERS rater each receive incentives based on percent reduction in building energy use (10 to 40 percent). The incentives range from \$400 to \$3,100 per dwelling unit, when participating in multiple programs. In addition to the ARRA and ratepayer funding partnership, owners also leverage additional ratepayer-funded programs including low-income direct install, solar thermal and solar PV programs. Between March 2011 and June 2012, the program assessed more than 1,800 units. 629 of these units completed upgrades, and an estimated 600 more will complete in 2012. The ARRA- and ratepayer-funded program partnership is discussed in more detail in ‘Leveraged Efforts’ section on page 8).

With the ARRA-funded EUC programs coming to an end, the California Energy Commission (CEC) is working with the California Public Utilities Commission (CPUC) to transition the program to rate-payer funding. In 2011, the California Investor-Owned Utilities (IOUs) released a plan for the next funding cycle which follows a similar incentive structure and utilizes the infrastructure developed through the ARRA-funded EUC programs. As of May 2012, Sacramento (SMUD) and San Diego (SDG&E) are continuing multifamily programs through December 2012 and the CPUC has directed the IOUs to propose a statewide multifamily program under Energy Upgrade California brand for the 2013-2014 program cycle.

Delivery Strategies

Strategies are examined in three areas: 1) service, 2) incentives, and 3) leveraged efforts.

Service Delivery

While the overarching goals of the NYSERDA Multifamily Performance Program (MPP) and Energy Upgrade California™ (EUC) programs differ, both share similar goals with regards to service delivery; specifically, delivering high quality energy efficiency services through a structure that meets the needs of the multifamily market. The programs aim to transform the market through appealing program design and ease of participation, allowing private energy efficiency firms to develop a direct relationship with the owner, while also supporting the continued development of these firms. For both MPP and EUC, these goals are achieved through training, mentoring, and quality control.

New York's MPP Service Delivery. The primary goals of MPP is achieving the program's energy savings goals and transforming the multifamily energy efficiency market in New York State. These goals are based on the funding requirements that support MPP, but also on NYSERDA's organizational mission to advance innovative energy solutions to improve New York's economy and environment. MPP's market-based approach to service delivery requires that owners work with a qualified service provider to facilitate their program participation. Owners can select any service provider, otherwise known as a Multifamily Performance Partner, as long as the provider holds a Partnership Agreement (NYSERDA 2011). Service providers join the program's "Partner Network" on a rolling basis and must demonstrate lead capacity on at least three multifamily sector energy retrofit projects. They must also have at least one Building Performance Institute (BPI) Multifamily Building Analyst (MFBA) on their team.

MPP-supported training for the MFBA is available through the Center for Energy Efficiency and Building Science, which offers courses through community colleges located in New York State. MPP reimburses up to 75 percent of the training and up to 50 percent of the certification cost for MFBA, or other training programs pre-approved by the program. MPP also reimburses up to 25 percent of pre-approved advertising to promote the Partner's services related to this Program and up to 50 percent of NYSERDA-approved modeling software costs.

Financial support for training is helpful to Partners, but the majority of Partner development and training happens during their program participation. MPP has robust technical standards and a thorough quality control process. These standards, combined with the complex nature of building assessments, billing analysis, energy modeling and construction management, as well as the wide variety of building types the program serves, require a significant amount of hands-on training. New Partners remain classified as "provisional," and cannot bring new projects into the program, until they have successfully brought their first project through the audit and work scope development stage of the program. For this first project, MPP's program administration contractor works closely with the new Partner to ensure their work meets the program's standards. In addition to direct assistance, MPP also developed several standards and tools that are intended to serve as guidance for the Partners including: a utility data analysis tool, a benchmarking tool, simulation guidelines, and minimum performance standards.

MPP employs both an implementation and a Quality Assurance (QA) contractor as part of the program team. MPP's implementation contractor, TRC Solutions Inc., in cooperation with NYSERDA, provides Quality Control (QC), overseeing project submittals and the Partner Network. Each submittal is reviewed and each project receives at least one, if not two, site visits during construction. In addition to project QC, MPP's QA contractors Taitem Engineering Inc., evaluate the success of the program as a whole by conducting random samples of project submittals and measure installation. They evaluate not only the quality of project submittals, but also the quality of TRC Solutions Inc. and MPP's QC.

Currently, there are 80 Partner firms participating in MPP, the majority serving one to two projects. The 17 most active Partners in the Network serve more than 80 percent of MPP's projects. Many of the Partners are technical firms that provide energy and engineering consulting services. Some firms have developed a successful business model serving customers in MPP and actively market the program to get business and recruit new participants. Other technical firms have existing relationships with owners and joined the network to bring these clients. In addition to technical firms, the Network also includes management companies and owners with large portfolios that have developed in-house capacity to manage their own projects.

California's EUC Service Delivery. The main goal of EUC is job creation, which is based on the requirements of ARRA, its primary source of funding. Similar to MPP, EUC utilizes a network of third-party professionals to support the program. Owners can choose from a list of qualified professional Raters to fulfill the assessment, modeling and verification requirements of the program. To become a Rater, the professional must complete mandatory training requirements, but is not required to show previous experience in the multifamily sector.

EUC leverages an existing workforce infrastructure, providing an opportunity to professionals who have traditionally served the new construction and code compliance market to enter a new market for energy efficient single- and multifamily retrofits. To qualify as a participating professional in EUC, a Whole-House Home Energy Rater (HERS II) must be certified by CalCERTS, a California HERS Provider (CEC 2009). Recognizing that the HERS II certification is designed to serve the existing single family homes sector, EUC developed additional training curriculum to address multifamily energy uses. This fully subsidized 5-day training combines classroom instruction with field visits to train Raters in the process of assessing, modeling and verifying a multifamily property. The intent of this training is to develop supplemental multifamily curriculum to the Whole-House Home Energy Rater training, for ultimate adoption by the California Energy Commission. The curriculum draws from the best practices of existing certifications, including Building Performance Institute (BPI) Multifamily Building Analyst (MFBA), applying these to the California building context.

As with NYSERDA's program, the bulk of the support and education for the program is provided in the form of technical support and mentorship from EUC as raters bring their first project through the program. As part of this support, EUC hosted a hands-on energy modeling training for multifamily buildings with software developer EnergySoft (creator of EnergyPro, the required energy modeling software for EUC). In addition, the program administrator Heschong Mahone Group, Inc. provides technical support, in the form of in-person modeling and assessment review clinics, phone consultations and shadowed assessments. Material resources provided by EUC include program policies and procedures, field data collection worksheets, and simulation guidelines.

Though EUC requires Raters to be qualified to serve the program, an owner can choose their installation contractor(s) from the public market. This is largely due to the professional nature of the multifamily sector, where owners have established relationships with contractors to perform maintenance and upgrades of their properties and prefer not to be constrained to a given list of contractors. Some owners prefer to hire a separate subcontractor to install each unique measure and manage the construction themselves, rather than hiring a general contractor. In Sacramento, EUC recognized the need for owner flexibility by allowing contractors to perform the assessment as well as the construction, as long as the contractor meets the training pre-requisites and the owner agrees to hire a third-party to perform the post-construction verification.

In San Diego, health and safety requirements require a BPI MFBA to conduct inspections and testing, and offer recommendations prior to approval of upgrade work scope. As many of the Raters are new to the industry, or to multifamily buildings, and not all qualified Raters have completed BPI training, the EUC decided not place the health and safety task on the Raters. Instead, the County of San Diego funded CalCERTS to conduct the inspections and testing, while also allowing the Rater to shadow the process. This allowed the Raters to gain experience in preparation for the next funding cycle, when they will be required to complete this testing.

In tandem with Rater mentoring, EUC provides extensive QA checks on the rater assessment data and energy models. As part of this process, EUC verifies the accuracy of the

energy model inputs and ensures that these inputs match the field notes and use appropriate default assumptions. EUC also reviews the predicted energy savings based on the proposed energy upgrades. QC inspections of field conditions are also conducted pre-construction in the San Diego region and post-construction statewide. QA reviews of energy assessment documentation occur on over half of Sacramento projects, while QC inspections occur on 10 percent of projects. In San Diego, quality assurance and quality control occurs on all properties, due to the requirements of combined funding sources.

Currently, there are 26 Raters qualified to participate in Sacramento and San Diego EUC programs. In this first program cycle, approximately one quarter of these 26 Raters were active in the program.

Incentive Delivery

Incentive structure and timing has an impact on program participation, energy savings and retention. Factors include to whom incentives are paid, timing, structure, and metrics.

New York's MPP Incentive Delivery. The Multifamily Performance Program (MPP) distributes incentives to the owner through the program process outlined below:

Planning Incentive. At the first program stage (Plan), the planning incentive is paid to the owner to offset the cost of hiring their Partner to conduct the audit, build an energy model, create a work scope, and write an Energy Reduction Plan (ERP). The incentive is paid once the ERP is approved and includes a base amount of \$5,000 (market-rate) to \$10,000 (affordable), and an additional payment of \$10 to \$20 per unit for buildings with more than 100 units (see Table 1 on page 1 for program definitions of affordable housing).

Installation Incentive. At the second program stage (Install), an incentive is available to help offset the cost of the energy measure installation. The incentive is \$1,200/unit for affordable projects and \$600/unit for market rate projects.⁵ To help with cash flow, the owner can opt to receive a portion of their installation incentive at 50 percent construction completion (based on percent energy savings installed). When the program was initially designed, NYSERDA assumed that the majority of owners would take advantage of the 50 percent payment option to help with cash flow issues. Not as many owners have taken advantage of it as expected, possibly signaling that cash flow is not as much of a concern as was originally thought.

Measurement Incentive. At the third program stage (Measure), an incentive is provided to projects that meet or exceed their predicted energy savings thresholds. This payment is key as it not only encourages the Partner to accurately predict savings and ensure that improvements are properly installed, but also allows NYSERDA to track the success of the program based on realized, rather than projected, energy savings. On average, projects realized 89 percent of the projected first year savings and saved 26 percent.

California's EUC Incentive Delivery. In contrast to MPP, Energy Upgrade California™ (EUC) distributes incentives to more than one party. The assessment incentive is paid directly to the Rater. The installation incentive is paid to the contractor in Sacramento and to the owner in San Diego. EUC does not require post-construction measurement of savings (due to the limited timeframe).

⁵ During the fourth cycle, the incentive was \$600 per unit for both affordable and market-rate projects.

Energy Assessment Incentive. The energy assessment incentive is intended to offset the rater cost to perform an assessment, build energy models, recommend the energy upgrades, and verify that the measures are installed to the energy efficiency specifications. In Sacramento, the incentive is based on property size (assuming economies of scale, the larger the property the lower the unit incentive). The incentive ranges from \$85/unit (for 100 units or more) to \$150 unit (for 20 units or less). One quarter of this incentive is paid after completion of the assessment and approval of the energy model and proposed energy upgrade work scope. The remainder of the incentive is paid upon completion of construction and field verification. When this incentive was designed for Sacramento EUC, there was concern that the partial incentive payment up-front would encourage drop-outs. Upon completion of the first cycle of the program, 43 percent of projects did not install the recommended energy upgrade work scope once the assessment was completed. However, many of these projects did not continue due to either the limited timeframe of the program or other ARRA requirements such as prevailing wage and historic properties. Removing these, the attrition rate is reduced almost by a half, totaling 26 percent.

In San Diego, the incentive is based on the predicted percent improvement margin (escalating at \$25 for every 5 percent increase in predicted savings above the 10 percent baseline). The full incentive in San Diego is paid upon construction and verification completion to avoid payment for assessment services without guarantee that the property will proceed with upgrades. The intent of the San Diego Rater incentive structure is to encourage deeper energy savings. This structure cannot yet be evaluated due to insufficient completions to-date.

Installation Incentive. The installation incentive is designed to offset a portion of the installed cost of energy upgrades, and is structured to encourage deeper energy savings. In Sacramento, the incentive starts at \$2,300 per unit for 20 percent improvement, and increases at \$50 per unit for each additional one percent improvement, capping at \$3,800/unit for 50 percent energy savings. Sacramento incentives are structured to start at a higher level to account for the added cost of prevailing wage requirements, an ARRA flowdown requirement. Subsequently, these incentives will be reduced in the second cycle of the program, which will be utilizing Sacramento Municipal Utility District (SMUD) ratepayer funds rather than stimulus funding. The incentive is paid directly to the general contractor. Similar to MPP, the incentives are paid in two equal installments, once at 50 percent completion and once at construction completion and verification. Partial completion is measured based on 50 percent completion of the energy upgrade work scope. In contrast to MPP, this partial payment structure is very popular in EUC, with more than 90 percent of projects opting for partial payment.⁶

In San Diego, incentives funded through San Diego Gas and Electric (SDG&E) start at \$550 per unit for 10 percent improvement and escalate up to a cap of \$1,500 for 40 percent improvement at 5 percent increments. The City of Chula Vista matches the SDG&E incentive, and the City of San Diego follows a similar tiered structure, offering \$350 at 10 percent improvement and \$1,400 at 40 percent. These incentives are paid directly to the owner upon retrofit completion. This ensures that energy savings are captured before incentives were paid. Additional discussion of these leveraged incentives is covered in the next section.

⁶ Projects which did not opt for partial payments were less than 20 units and therefore did not have as serious cash flow issues as larger projects which had high up-front equipment order costs.

Leveraged Efforts

Program collaboration and leveraging among utility companies, government agencies, non-profit organizations and financial institutions can have a substantial impact on the success of a program, from both the participation and administration perspective. Benefits of such collaboration include: deeper energy savings, increased cost-effectiveness for both participants and implementers, and program cross-promotion. The challenges carry equal weight, however, and include: alignment of program timelines, eligibility, and requirements, management of distribution of cost and energy savings, prevention double-counting, and implementation of streamlined participation. With incentives designed to offset only a portion of the installed cost of energy upgrades, owners appreciate the opportunity to layer programs to minimize the funding gap, and maximize energy savings and cash flow. NYSERDA's Multifamily Performance Program (MPP) and Energy Upgrade California™ (EUC) both made an effort to facilitate participation in multiple programs.

Coordination with State Weatherization Programs. Leveraging weatherization programs, which offer no-cost, direct-install measures to income-qualified buildings, is an aim of both MPP and EUC. This effort is more successful in New York than in California due to complementary funding sources, and shared energy savings calculation tools and a sustained directive for coordination between the two agencies. Because New York's MPP is rater-payer funded and the state weatherization program is federally funded, both programs are able to claim energy savings. California's EUC, on the other hand, shares a federal funding source with the state weatherization program. Consequently, energy savings must be split, not shared. Additionally, New York State's weatherization program uses eQuip software to calculate energy savings, which is an eligible MPP tool, so buildings participating in both programs only create one energy model. In California, EnergyPro is the only approved software for use in EUC, but is not approved for weatherization, so duplicate energy analysis must be performed. Consequently, owners typically chose to participate in one program, not both. California is working to qualify the EnergyPro software, however, additional analysis is currently being performed to determine whether the software is appropriate and equivalent to the existing software tools.

Stacking Rate-Payer-Funded Programs. Weatherization is the only non-NYSERDA program that multifamily owners can combine with MPP. They are, however, eligible to participate in some of NYSERDA's other programs in addition to MPP. These programs include NYSERDA's Solar PV and Solar Thermal, combined heat and power, and the Electric Reduction in Master Metered Buildings programs, as they cover measures not addressed by MPP. Some New York State utilities run small multifamily programs (5 to 75 units) outside of NYSERDA. In these cases owners must choose between the utility-run program and MPP.

California's EUC works closely with several rate-payer-funded programs, including: Energy Savings Assistance Program (ESAP), California Solar Initiative (CSI) Solar-Thermal program, Multifamily Affordable Solar Housing (MASH), and Multifamily Energy Efficiency Rebate Program (MFEERP). ESAP, a direct install weatherization program available to low-income customers, was a prerequisite for participation in EUC in San Diego. In order to qualify for SDG&E incentives, the owner must sign the ESAP owner waiver, allowing SDG&E to

upgrade, with limited scope⁷, individual dwelling units. The baseline energy use for participation in EUC is set after ESAP is completed, so as to prevent double-counting. While this coordination allows the owner to leverage no-cost measures, it also involves extra touches to units, and requires qualification of each tenant rather than qualifying at a property level. Statewide, California utilities are revising the programs to streamline participation in both ESAP and EUC.

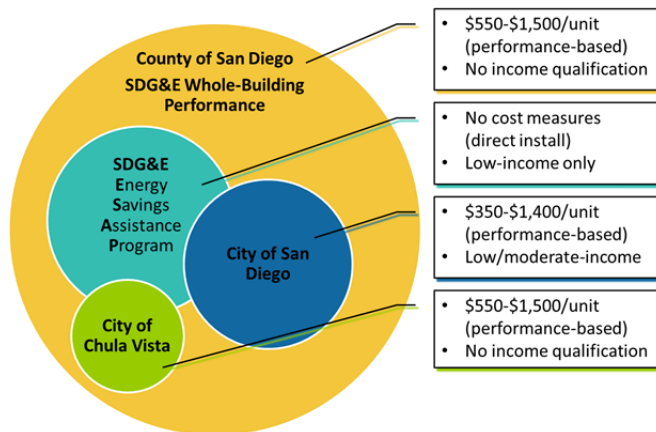
CSI and MASH incentives can be layered with EUC incentives, adding renewable energy to the energy efficiency work scope performed under EUC. Program managers worked together to cross-promote programs, yet separate applications, requirements, processes, and timelines make coordination challenging. Because MASH incentives were fully reserved before EUC launched, EUC reached out to MASH participants to get them to also participate in EUC. This challenge does not exist with CSI, where funding is still available. CSI and EUC can be applied simultaneously. Projects in the City of San Diego are able to claim solar thermal system installation as an energy upgrade measure and receive ARRA-funded incentives under EUC. Due to the high impact of solar-thermal installation in coastal buildings in California, an appealing option is to claim EUC incentives from the City of San Diego, including solar-thermal, and layer additional CSI incentives. To avoid competition between the CSI (rate-payer funded) and SDG&E's EUC program, solar-thermal installations are not eligible for SDG&E incentives under EUC.

MFEERP is SDG&E's prescriptive rebate program for multifamily buildings. Most measures eligible for MFEERP incentives are also eligible under EUC. Incentives may be claimed from one or the other, not both, for a given measure. Properties are screened to determine the appropriate upgrade approach (tune-up, prescriptive, whole-building). Newly constructed or upgraded properties, and properties with limited budget, are guided to MFEERP, while those ripe for whole-building retrofit were encouraged to pursue EUC.

Layered Whole-Building Incentives. San Diego EUC combines administration, infrastructure development, and outreach funded by ARRA (through the County of San Diego) with incentives from SDG&E, the City of San Diego, and the City of Chula Vista (see Figure 4). Therefore, each partner is reliant on the others for at least a portion of the program. Many argue that this partnership made efficient use of both ARRA and rate-payer funds. Yet, the varying timelines, goals, and requirements brought many challenges to EUC. While the program end date is consistent across the County and City funding, contract start dates varied across a 6-month window, making it difficult for the programs to align and ramp-up. SDG&E is not restrained by the ARRA timelines, but needs approval from the Public Utilities Commission before launching their program. As the program progressed from recruitment to the installation phase, more partners came aboard. Each new partner added new requirements.

⁷ ESAP work scope includes: weatherstripping, lighting, refrigerator and furnace replacement.

Figure 4. Leveraging



The partnership aimed to present the EUC program as a single program, with a streamlined application and participation process. This was an excellent marketing strategy of broad reach with limited development of marketing collateral. Though the program delivery was unified, from the participants' perspective, each additional partner represented program changes, rather than additional resources as participants are asked to comply first with ARRA provisions and later with utility health and safety requirements.

San Diego EUC has trained Raters to understand the intricacies of each program and serve as a single point of contact to the owner. While the software tool used by each program was the same, the energy savings and incentive calculation methodology differed. The City of San Diego relies on time-dependent valuation of site energy savings to calculate the percent improvement at a property level. SDG&E uses unweighted site energy savings, calculated at the building level. Therefore, a property receives an incentive for improvement at the property level from the City of San Diego, and different incentives for each building from SDG&E. In order to qualify for incentives from the City of San Diego, the property also must serve low- and/or moderate-income (up to 400 percent of federal poverty level) tenants. Each Partner has internal quality assurance/control strategies in place as well. Great efforts were made to coordinate site visits to limit the number of touches, however, ultimately overlapping site visits are a reality.

Conclusion

When designing future multifamily whole-building retrofit programs, consideration of the delivery strategies outlined in this paper is encouraged to enable sustained success. This paper examined program delivery strategies of two whole-building multifamily retrofit programs: NYSERDA's Multifamily Performance Program and Energy Upgrade California™ Multifamily. Though these programs differ, the underlying delivery principals are aligned. The common conclusions from each of the three delivery strategies discussed in this paper are outlined below.

Service Delivery Recommendations

Whole-building multifamily retrofit programs must provide the owner flexibility when choosing their team. The third-party model has proven effective in providing owners with this choice. Service delivery recommendations are as follows:

Train third-party service providers to support the program and assume the need for continuous improvement and mentoring. As part of this training, assume there will be a strong need for technical support as these professionals get up to speed on the complexity and variety of

multifamily building types. This support comes in the form of classroom and field training and one-one one mentoring.

Require shadowing and implement a trial period for new partners. NYSERDA's system for initiating partners by requiring a minimum experience with three projects as well as the requirement to prove performance with the first program project should be replicated.

Allow owners flexibility in choosing their team. These professionals, if trained and mentored correctly, can act as a primary marketing arm for recruiting new participants. Allowing owners to select their team not only makes the program appealing and accessible, but also places the burden of finding the most suitable professionals on the market rather than the program. Verification that the contractor installed upgrades in accordance with program procedures is completed as part of the post-construction verification performed by the Rater.

Incentive Delivery Recommendations

Two incentive types are imperative for sustained success of multifamily whole-building retrofit programs: 1) planning/assessment incentives and 2) post-construction incentives for realized energy savings. The timing and the amount of these incentives will vary based on market maturity and climate conditions. Incentive delivery recommendations are as follows:

Distribute incentives to the property owner. Though EUC in Sacramento saw a benefit in distributing incentives to the contractor, it is cleanest to distribute the incentives to the property owner directly. The owner is the key decision maker and holds the capital for energy upgrades. As future retrofit programs focus less on ARRA job creation and more on energy savings and market transformation, programs incentives will not cover as large a portion of the upgrade cost, requiring owners to have more up-front capital. Secondly, it is not common practice for the owner to hire a general contractor, but rather most owners prefer to manage the installations themselves, hiring subcontractors for each measure. At the owners' request, it is appropriate to release the incentive to another party such as the property manager or the contractor.

Provide an incentive to offset the cost of the energy assessment/audit. Performing an energy assessment, building models and providing recommendations for cost-effective energy upgrades for multifamily buildings is a complex and time consuming task. In newer markets such as California, where whole-building programs have not been provided at scale, it is especially important to provide this incentive to encourage owner participation. This is particularly important in regions where owner recognition of program benefits is untested and/or where gap financing to support owners with up-front costs is limited.

Implement performance measurement requirements when feasible. Measured data can be used to improve the accuracy of energy modeling and zero-in on the most common installation issues that impact performance. In addition, reliable savings measurements are essential for market transformation, enabling financing agencies to develop products to bridge the gap in owner capital and improvement cost.

Leveraged Efforts Recommendation

Leveraged program efforts must be carefully coordinated to be successful. If well-coordinated, these leveraged efforts enable project teams to deliver deeper retrofits that would otherwise be feasible. To successfully leverage programs, one key recommendation must be implemented:

Align program requirements and policies prior to program launch. Program leveraging is very successful in New York as program processes, eligibility requirements, and tools are aligned. This alignment of policies is paramount to program success and is also vital to keeping owners engaged in the program. Most importantly, this leveraging must aim to be seamless to project teams, with coordinated delivery of incentives, paperwork, and field inspections. In the case where programs cannot be aligned in the immediate term, or share different timelines, planning for coordination in a future funding cycle is more fruitful.

References

[CEC] California Energy Commission. 2010. *Exhibit D. General Provisions – State Energy Program (SEP)*.

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