

# SMUD Home Performance Program

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Final Report – April 2012

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# **Home Performance Program Final Report**

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## EXECUTIVE SUMMARY

### Program Background:

On September 2, 2010, Sacramento Municipal Utility District (SMUD) was awarded a \$19,969,421 State Energy Program (SEP) contract from the California Energy Commission (Energy Commission) as part of the Federal American Recovery and Reinvestment Act (ARRA) grant from the U.S. Department of Energy (DOE). SMUD launched the Home Performance Program (HPP), a residential energy efficiency retrofit program with the goal to transform the market by offering a whole-house approach for energy efficiency.

The key components of HPP were comprehensive whole house approaches to home improvement based on the use of building science principles to address comfort, moisture, and energy performance problems. In December 2011, SMUD's contract amount was amended to \$17,969,421.

The goal of HPP was to utilize SEP funding and extensive leverage funding to deliver a multi-component program to bring energy efficiency assessments and home performance retrofits to the Sacramento region. The program was delivered through SMUD and a collaborative consortium of partners including the County of Sacramento, the Cities of Sacramento, Rancho Cordova, Citrus Heights, Elk Grove, Folsom and Galt, Los Rios Community College District (LRCCD), Sacramento Employment and Training Agency (SETA), Build It Green (BIG), Community Resource Project (CRP), and the Sacramento Housing Redevelopment Agency (SHRA) with subcontractor support from Build It Green and California Building Performance Contractors Association (CBPCA), and partner support from ConSol, a Building America Cooperative Agreement recipient.

### Original Approach and Implementation:

The original objectives of HPP were to provide Home Energy Rating System Phase II (HERS II) assessments and/or home performance retrofits to approximately 15,150 homes, preserve or create 1,148 jobs, ensure high quality retrofits up to 1,050 low-income homes and 100 moderate-income foreclosed, purchased and renovated homes, create significant demand for building science professionals providing the catalyst for technological advances, and provide significant and permanent energy savings in Sacramento households to free up disposable income and have long-term economic benefits.

HPP pursued these original objectives through California Comprehensive Residential Building Retrofit Program Tiers I, II and III. HPP also leveraged \$8.8 million from SHRA through Neighborhood Stabilization Program (NSP) funding and \$1.5 million from CRP through weatherization funding to make energy efficiency retrofits to the homes of low and moderate-low income Sacramento residents.

At that time, the program was to develop a training partnership with SETA and LRCCD to train contractors in assessment and building performance science. SMUD would be receiving a leverage of \$600,000 from Consol's Build America Cooperative Agreement with the DOE to

implement HPP for Neighborhoods to deliver both a prescriptive approach and a performance-based approach to retrofit up to 2,000 homes in target neighborhoods in Sacramento. HPP for Multi-family (MF) would pilot a comprehensive multi-family retrofit model, which aimed to achieve an initial 20% savings across the portfolio and provide a blueprint to attain up to 40% savings through a multi-year investment plan.

SMUD and its partners would be conducting a sophisticated marketing program, founded on SMUD customer research, to foster ongoing awareness, education, consideration and participation in HPP. Ultimately, HPP would preserve and/or create “green,” energy efficiency assessment, rating, contracting, retrofitting, measurement and verification jobs, and would result in 16,756 tons of CO<sub>2</sub> emission reductions per year to support California’s Energy Action Plan goal.

Since September 2, 2010, SMUD has requested and the Energy Commission approved several amendments and changes to the contract which impacted the approach and implementation plan to HPP:

- Amendment 1 (March 30, 2011): ConSol was added as a subcontractor and their in-kind cost share amount was reduced from \$600,000 to \$100,000.
- Amendment 2 (June 14, 2011): Retrofit rebate per home/unit was increased to support market activity at that time which resulted in a decrease in program unit goal. An additional task (Task 3.0 - Contingency) was also added to 1) shift funds from single family to support multi-family program and 2) support contractor marketing enhancement activities.
- Amendment 3 (Nov. 9, 2011): Task 2.0 subtasks and budgets were consolidated for the overall technical activities and the Enhanced Weatherization component was added to the single family program. Task 3.0 – Contingency was eliminated.
- Letter of Agreement (Dec. 22, 2011): The Energy Commission and SMUD agreed to disencumber \$2 million of SMUD’s contract funds and in turn the Energy Commission provided the \$2 million of additional contract funds to CHRHMFA Homebuyers Fund (CHF) to support single family retrofit loan program within the SMUD territory. The contract was reduced from \$19,969,421 to \$17,969,421.
- Amendment 4 (March 6, 2012): The contract was extended from March 31, 2012 to April 30, 2012.

Overall, the above HPP amendments and changes decreased the unit goal, reducing the number of assessments and home retrofits to 11,770; jobs creation to 758; CO<sub>2</sub> emission reduction to 9,054 per year; and total leverage amount of the program from \$65 to \$45 million.

Outcomes and Benefits:

SMUD's HPP was a great success with several of its components being recognized by customers and peers alike as a program that will transform the industry. The program generated tremendous community and media interest in the Sacramento region. This favorable response prompted SMUD to launch a post-ARRA program to support wait-listed projects. SMUD has made strides in emissions reductions and energy savings in the following ways:

- Decreased CO<sub>2</sub> emissions by 6,921 tons
- Reduced energy consumption by 9,689 MWh
- Decreased energy demand by 11.5 MW
- Reduced natural gas consumption by 45 mmcf

One of SMUD's biggest goals was to create or maintain jobs in the current economy. Under HPP, a running total of 745 full-time employees (jobs) were created or saved according to the DOE formula which was outlined in the ARRA reporting template.

HPP conducted 18,860 assessments (2,709 Building Performance Institute (BPI), 1,012 HERS II single family, 680 CRP HERS II, 172 SHRA HERS II, 11,289 multi-family HERS II, 998 Basic Audits, and 2,000 low income weatherization energy assessments)<sup>1</sup>, and retrofitted 1,095 single family homes. There were 2,513 multi-family retrofitted units (1,276 units using ARRA SEP funds and 1,237 units using SMUD funds). For the 2,000 weatherization energy assessments, 2,445 energy efficiency measures were installed in the homes. For specific energy savings information, see the chart below.

Program	Estimated Energy Savings Level	Estimated Average Energy Savings (kWh/yr)	Estimated Annual Therm Savings	Number of Home/ Unit	Estimated Cumulative kWh/Yr Saved	Estimated Cumulative therm/Yr Saved
Single Family Prescriptive Home	10%	921	58	50	46,032	2,881
Single Family Performance Home	38%	4,170	311	1,045	4,357,211	324,587
Multifamily Retrofit	29%	2,061	47	1,276	2,629,018	60,487
Enhanced Weatherization (Retrofit)	15%	1,377	N/A	2,000	3,389,326	N/A
Basic Audit	10%	2,906	N/A	998	2,900,808	N/A

<sup>1</sup> The low income weatherization energy assessments were done by SMUD and were not paid with ARRA-SEP funds.

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HPP customers became more aware of their energy usage and the cost-effective options available to them to reduce their carbon footprint. Through the program incentives and training partnerships, the following benefits have continued to grow since program inception:

- Increased energy efficiency and peak energy reduction in single and multi-family homes;
- Increased market and end-user awareness of home performance/whole building performance;
- Transformation of the building retrofit market from individual contractor trades to “whole building” contractor approach;
- Lowered cost of the initial assessment to provide greater customer access;
- Increased contractor competency;
- High-quality retrofits and energy efficiency savings accessible to all customers;
- Provided jobs and facilitated job growth;
- Developed the infrastructure to deliver the highest quality contractor education and training; and
- Customer home assessments increase building demographic knowledge for future energy program development.

In this report, SMUD will discuss best practices and recommendations for each of the components of HPP.

## **GOALS**

SMUD’s HPP had eight major components:

- Single Family
- Neighborhood Approach
- HERS II and BPI Assessments
- Multi-Family
- Enhanced Weatherization
- Basic Assessment
- Workforce Training and Development
- Marketing

Below are the comparisons of the original goals, revised goals, and accomplishments based on the amendments. For the single family and multi-family retrofit goals, incentive amounts were increased, resulting in a decrease in unit goals.

### ***Single Family***

*Original Goal:* 4,000 Prescriptive and 2,000 Performance Home Retrofits

*Revised Goal:* 80 Prescriptive and 1,000 Performance Home Retrofits

*Accomplishment:* 50 Prescriptive and 1,014 Performance Home Retrofits

The performance program was more popular of the two due to the rebate levels.

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***Neighborhood Performance***

*Original Goal:* 1,500 Prescriptive and 500 Performance Home Retrofits

*Revised Goal:* 20 Prescriptive and 230 Performance Home Retrofits

*Accomplishment:* No Prescriptive and 31 Performance Home Retrofits

The original goals were to retrofit 2,000 homes in up to 10 neighborhoods, but only 31 homes were retrofitted in four neighborhoods. Reasons for the few retrofits included: customers could not afford to retrofit their home; CHF financing ran out and/or customers were not qualified; and lack of energy savings/not cost effective due to recent home improvements<sup>2</sup>.

***Assessments***

Before any of the retrofit work could be done, there were a variety of assessments that were offered to the customers. Below are the goals for each type of assessment. (For details, please review the accomplishments section.)

***BPI Assessments (through contractors)***

*Original Goal:* 0

*Revised Goal:* 2,100 Homes

*Accomplishment:* 2,709 Homes

To jump-start the program and attract more retrofits at the beginning of HPP, the Energy Commission had approved providing an incentive amount of \$400 per assessment for the BPI assessment component.

***HERS II \$99 Assessment***

*Original Goal:* 3,000 Homes

*Revised Goal:* 1,000 Homes

*Accomplishment:* 1,012 Homes

The original goal of the HERS II program was to perform about 3,000 HERS II ratings. The goal of 3,000 decreased to 1,000 because there were challenges with creating a demand for HERS II ratings and having HPP contractors use the assessment to generate a scope of work and a bid.

***HERS II – Community Resource Project (CRP)***

*Original Goal:* 1,050 Homes

*Revised Goal:* N/A

*Accomplishment:* 680 Homes

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<sup>2</sup> CRHMFA Homebuyers Fund (CHF) is a government entity that provides affordable housing finance options for low-to-moderate income individuals and families in California. CHF received \$30 million in ARRA SEP grant from the California Energy Commission and provided competitive financing and grants to homeowners interested in making energy efficiency improvements to their home as part of the CHF Residential Energy Retrofit Program.

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The goal of the program was to compare two different energy simulation tools; HERS II/EnergyPro and REM/Rate (see accomplishment section for program details).

***HERS II – Sacramento Housing and Redevelopment Agency (SHRA)***

*Original Goal:* 300 Homes

*Revised Goal:* 100 Homes

*Accomplishment:* 172 Homes

SMUD originally entered into an MOU with SHRA to pay for the cost of HERS II ratings on 300 homes that were foreclosed and re-purchased by the Agency. The goal was reduced to 100 homes due to SHRA's inability to secure the second half of the NSP funding that was anticipated. SHRA achieved 172 test-in and 112 test-out HERS II assessments.

***Multi-family***

*Original Goal:* 2,000 Unit Retrofits

*Revised Goal:* 1,500 Unit Retrofits

*Accomplishment:* 1,276 Unit Retrofits by ARRA-SEP, 1,237 Unit Retrofits SMUD funded

HPP -MF retrofit goal was to retrofit 1,500 multi-family units. Given the funding flexibility provided under the contract, SMUD ended up retrofitting 2,513 multi-family units. Due to contract budgetary limits, 1,276 units were funded by ARRA-SEP, while the remaining 1,237 units were funded by SMUD. The multi-family program also achieved 11,289 test-in and 2,513 test-out HERS II assessments. The HERS II-related participation, education, and compliance goals were met.

***Enhanced Weatherization***

*Original Goal:* 0

*Revised Goal:* Perform up to 1,500 energy assessments and up to 2,998 energy efficiency measures

*Accomplishment:* 2,000 energy assessments and 2,445 energy efficiency measures

The goal was to perform 1,500 weatherization energy assessments and install up to 2,998 energy efficiency measures (1,500 refrigerators, 380 HVAC systems, 382 insulation jobs, and 736 miscellaneous air sealing/caulking jobs). SMUD traditionally has an unmet demand for low-income weatherization, so goals were easily met with 1,479 refrigerators, 416 HVAC systems, 293 insulation jobs, and 257 miscellaneous air sealing/caulking jobs.

***Basic Assessment***

*Original Goal:* 1,000 Homes

*Revised Goal:* N/A

*Accomplishment:* 998 Homes

SMUD's goal for this program was to have 1,000 basic assessments completed while spending \$500,000. The Program Administrator, Benningfield Group, achieved 998 assessments. In addition, there was a saving goal of approximately 30% per household.

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### ***Workforce Training/Job Development***

The workforce goal of SMUD's HPP contract was to develop training partners' capacity for HPP in order to support near-term contractor training needs for program participation and establish a workforce development training infrastructure to preserve or create jobs for HPP. Total full time employee (FTE) jobs created or saved for HPP was originally estimated at 758 based on a previous equation specified per ARRA guidelines of Total Project Cost divided by \$92,000. Since the program started, a new equation per DOE's Federal ARRA 1512 report (a running total of hours worked divided 2,080 hours/year) was used which decreased the overall FTE job created/saved goal to 600 (which SMUD exceeded at 745 FTE job created/saved).

#### **Build It Green (BIG):**

*Original Goal:* Implement four BPI training events over 18 months, training 40 contractors per event and proctor BPI field tests for 120 trainees.

*Accomplishment:* Implemented two BPI training events over 18 months, trained 93 students (35 passed BPI written exam, proctored BPI field tests for 29 trainees/21 passed BPI field exam, and 21 became BPI certified).

BIG was short of two training sessions because both October and November 2011 training sessions were cancelled due to the competing Energy Upgrade California (EUC) training that was offered at much lower cost of \$65 per person.

#### **Los Rios Community College District (LRCCD):**

*Original Goal:* Train and prepare 80 students to work within the home performance field as HERS raters, BPI contractors, and other supporting construction roles of the home performance industry.

*Accomplishment:* Implemented 165 BPI training classes over 18 months, trained 74 students under this component, proctored BPI field tests for 51 trainees, and achieved 31 job placements.

### ***Marketing***

SMUD developed a comprehensive and fully integrated marketing strategy designed to foster awareness, consideration, and participation in SMUD's new HPP.

The marketing goal was to provide customers with the information and resources needed to engage in a comprehensive energy efficiency action plan for increased comfort, savings and safety. To receive the maximum rebate level and achieve the highest energy savings and comfort possible, customers were encouraged to participate at the highest energy upgrade option.

SMUD worked collaboratively with the Energy Commission to integrate the EUC brand into SMUD marketing collateral, as well as provide content for the EUC web portal. In addition, SMUD participated in the EUC contractor co-marketing program by helping five contractors to co-advertise HPP.

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## ACCOMPLISHMENTS

### *Single Family Program*

SMUD utilized the California Building Performance Contractors Association (CBPCA) to offer SMUD customers a comprehensive whole house approach to home improvement based upon the use of building science principles. CBPCA was tasked with program development and administration, trade contractor solicitation and qualification, implementation and management, field training and mentoring, and marketing. The program developed by SMUD and CBPCA included two options: (1) “Performance” and (2) “Prescriptive.”

The Performance option included a home assessment, a discussion of upgrade options for the homeowner of selected measures, the installation of agreed-upon measures to improve the safety, durability, comfort, and environment of the home, combustion safety testing, and possible verification of the job. BPI certified contractors assessed the performance of a house, diagnosed comfort, moisture, and energy performance problems, verified combustion safety, and identified the most effective solutions to those problems. Rebates of up to \$9,000 from SMUD and Pacific Gas and Electric (PG&E) could be achieved if large-scale energy savings were detailed through the use of pre- and post-retrofit energy modeling.

The Prescriptive Option included a program-specific assessment and a limited assessment and report that included specific home improvement measures. Rebates of \$1,500 were offered for this option, with the above referenced stipulations.

### Key Activities:

The original home retrofit goals of the two programs were to retrofit 4,000 homes under the Prescriptive component and 2,000 homes under the Performance component. These goals were not met for several reasons:

- a. The program was developed and implemented during a prolonged recession in which home values declined dramatically in the SMUD service territory. This negative economic climate caused homeowners to cancel, delay, and/or trim any plans that they had to spend the estimated \$10,000 to \$15,000 to improve their homes, even with the possibility of receiving a rebate.
- b. The Performance option was more popular because of the increased incentive amount. Training contractors to use new technologies and to sell projects to customers took more time than projected.
- c. Affordability was an issue due to the lack of expected PACE financing.

While there was no quantifiable way to measure the increase in contractor and homeowner knowledge about building science, it seemed clear that program-related documents and training, information channels, program- and financing-related information, and mentoring all increased contractor and customer knowledge based upon increased contact from customers and interested contractors. The contractor-related participation, education, and compliance goals were met. Documents necessary for participating contractors to execute the program were created on a

timely basis and were updated as needed. Documents and training to increase the level of participating contractor knowledge were created, executed on a timely basis, and updated as necessary. Channels through which participating contractors received information about specific questions were established and used successfully. Education about alternative financing, various new regulatory requirements, and other issues that occurred throughout the program was provided through regular participating contractor meetings, newsletters, and various electronic communications. In-field mentoring of participating contractors occurred in a timely and organized manner.

Data collection goals were met through the use of the Vision database. Quality Assurance (QA) goals were realized in a timely fashion, both pre- and post-retrofits. In addition, corrective actions were taken in a timely fashion to ensure homeowner satisfaction and safety. The goal of ensuring swift and effective communication between EUC programs, which was not envisioned in the contract, was difficult to meet. With two separate administrators working for SMUD's and PG&E's distinct programs, lines of communication had to be created midway through the program. Fortunately, CBPCA advocated on behalf of SMUD with Build it Green (BIG), PG&E's Program Administrator, and created a solid contractual QA relationship with BIG. Therefore, SMUD customers were subject to only one post-retrofit in-field verification visit should that project be selected for such verification, instead of receiving separate visits from SMUD and PG&E program verifiers.

The process through which retrofit jobs were accepted and completed, and parties involved, is as follows:

- a. Home assessment (HERS II Raters or BPI Contractors)
- b. Defining work scope with customer (BPI Contractors)
- c. Required pre-retrofit testing (HERS II Raters or BPI Contractors)
- d. Completion of the Job Reporting Template (JRT) (BPI Contractors)
- e. Completion of EnergyPro modeling software (HERS II Raters or BPI Contractors)
- f. Submission of project through Vision database (BPI Contractors)
- g. Pre-retrofit desk check QA (mandatory, CBPCA and subcontractor))
- h. Pre-retrofit in-home QA (depending upon random selection, CBPCA)
- i. Fast-Track approval may be used instead of (g) and (h)
- j. "Authorization to Proceed" with retrofit (CBPCA)
- k. Required post-retrofit testing (CBPCA)
- l. Required post-retrofit submissions through Vision database (HERS II Raters or BPI Contractors)
  - i. Data
  - ii. Rebate Application
- m. Post-retrofit desk check QA (mandatory, CBPCA)
- n. Post-retrofit QA (depending upon random selection, CBPCA)
- o. Rebate processing (Helgeson)
- p. Customer survey (CBPCA)

SMUD offered two loans per project, a secured and unsecured product. The secured interest rate was 8.75 % and the unsecured was 10.75%. The loan amount was limited to \$5,000 for the unsecured product, with a three-year term. The secured was up to \$30,000 with a 10-year term.

These rates and terms were not attractive enough to drive customers into the SMUD Loan Program for Home Performance, although 41 customers did take advantage of the financing options. CHF provided 3% loans with very easy eligibility requirements. This product was eagerly accepted by consumers; approximately 400 HPP customers chose this financing option for their homes.

#### Outcomes:

The single family component was successful in completing 2,709 BPI assessments and 1,064 home retrofit jobs. SMUD's single family home market penetration compared to other utilities is:

- 18 retrofit jobs/10,000 SMUD residential accounts
- 4.1 retrofit jobs/10,000 other utility residential accounts
- 2.3 retrofit jobs/10,000 other utility residential accounts (excluding SMUD territory)

A whole-house retrofit job saved on average 4,170 kWh (about 38%). Even the limited availability of CHF financing demonstrated its value; during the period in which CHF financing was available, SMUD administrators kept a constant watch on the amount of funding available as homeowners eagerly used the financing. If financing options were available, single family homeowners would be much more willing to retrofit their homes versus if financing was unavailable, given the current economic environment.

#### Home Makeover Sweepstakes:

As a part of SMUD's HPP – a partnership with Energy Upgrade California, hundreds of entrants entered for the opportunity to win a comprehensive energy makeover to increase the overall quality and comfort of their home in addition to reducing their energy use. One family was selected as the winner of the Home Energy Makeover Sweepstakes and the makeover of their home was completed in October 2011.

### ***Neighborhood Performance Program***

The neighborhood HPP shared the same basic objectives and technical approach to home retrofits as the single family home performance program, with the addition of marketing the home performance retrofits with a neighborhood focus. The unique objective of the neighborhood approach was to test the theory that a significantly higher level of market penetration of home performance retrofits could be achieved by leveraging the social networks found in tight-knit neighborhoods. The neighborhood approach was quite successful, providing the opportunity for economies of scale and efficiencies if implementing many jobs in a neighborhood with somewhat uniform construction and vintage.

#### Key Activities:

ConSol contracted with SMUD to develop, implement and evaluate a neighborhood approach to existing home energy efficiency retrofits. Program activities included: target neighborhood research; assessment of the neighborhoods; development of the performance-based good, better,

best packages; marketing collateral and neighborhood meetings to elicit participation; a competitive Request for Proposal (RFP) process for and choice of the contractor; introduction of the contractor to participants; and retrofits.

ConSol and SMUD identified the target pilot neighborhood based on several variables that included – average age of homes, average square footage, neighborhood size, average household income level and presence of an active homeowners association (HOA). The additional three neighborhoods were selected based on whether they had an active HOA, their income ratio, their energy use ratio, the age of the home, if the homes were of similar construction, and if they were in SMUD’s district coverage.

Package development: Program experience demonstrated that the packages should not be considered static and should be utilized primarily as a tool to simplify the sales process for the contractor and homeowners. Therefore, the packages created for the neighborhood program, as detailed below, incorporated the most cost-effective improvements while leaving each homeowner with the choice to customize the specific energy efficiency measures of their retrofit package, driven by various factors, including homeowner’s budget, and the needs of their home.

- The estimated modeled annual savings for each package was:
  - Good Package - 22% energy savings and \$360 utility bill savings; estimated cost: \$4,000-\$6,000 with rebate up to \$2,500
  - Better Package - 35% energy savings and \$600 utility bill savings; estimated cost: \$12,000-\$15,000 with rebate up to \$4,750
  - Best Package - 46% energy savings and \$1,140 utility bill savings; estimated cost: \$25,000-\$30,000 with rebate up to \$9,000

Marketing collateral and homeowner outreach: In the initial outreach, ConSol and SMUD worked with Arden Park’s neighborhood HOA, using both traditional marketing channels (HOA newsletters and meetings, yard signs, door knob hangers, community events, meet the contractor and energy educational meetings) and new media (web based channels and third party websites) to connect with homeowners and promote the program. Word-of-mouth testimonials, from satisfied Arden Park participants (including HOA board members), increased other homeowners’ willingness to inquire about the program during the second wave of marketing which included more traditional marketing and new media (HOA social media approach) to promote the program.

Due to the low initial interest during the first wave of outreach, the selected contractor was emboldened to support a second wave of Arden Park outreach to encourage additional homeowner interest. It was found that an initial awareness campaign and sign-up period would attract the early adopters, but is not wholly sufficient, and therefore needs to be coupled with a longer term strategy in order to attract the remaining homeowners.

CHF provided 3% loans with very easy eligibility requirements. This financing program was the most popular within the three later neighborhoods. CHF was not available in the pilot neighborhood, where homeowners paid with cash or a combination of cash and private

financing. SMUD offered two loans per project, a secured and unsecured product, but only one homeowner took advantage of SMUD financing due to the higher interest rates.

Outcomes:

The program achieved a higher market penetration rate than the single family HPP (eight times higher in the pilot neighborhood, and the penetration is three to five times higher across all four targeted neighborhoods).

Following the launch of the pilot neighborhood and loss of Consol's Building America funding, the time needed to approach near-term market saturation was still unknown. Before additional neighborhoods could be launched, the program was put on hold due to administrative delays associated with a new contract to backfill the cancelled Building America contract. This resulted in the loss of six months during the prime sales season leaving only early fall and the holiday months to complete homeowner outreach and education. The program design and implementation process provided valuable lessons learned in marketing outreach, including:

- Early adopter focus providing initial energy efficiency retrofits which provided a marketable program proof of concept through positive testimonials from knowledgeable homeowners.
- Utility support and involvement in homeowner outreach and education which along with early adopter testimonials provided programmatic trust and legitimacy to the mass market.
- Mass market adoption took time by means of frequent and sustained educational outreach through traditional and new media to reach a broader pool of homeowners.
- The neighborhood approach had promise. Based on our experience and achieved market penetration, we estimated that a three-year program could achieve significantly higher participation rates and possibly approach market saturation within a neighborhood.

Across the four targeted neighborhoods, there were 33 homeowners taking advantage of the program rebates to complete their energy efficiency upgrades (i.e., signed contracts) including 31 completed retrofits. The table below showed the homeowner participation rates:

*Job Summary Chart:*

	Total Number of Homes	Interested Home-owners	Energy Assessments Scheduled or Completed	Consultations Completed or Scheduled	Signed Contracts	Retrofits Completed
Arden Park	1,906	56	50	30	15	15
CHASE	3,385	33	18	15	2	2
Lincoln Village	1,771	30	14	10	4	4
Rancho Murieta	2,171	74	46	43	14	10
<b>Totals</b>	<b>9,233</b>	<b>193</b>	<b>128</b>	<b>98</b>	<b>35</b>	<b>31</b>

Only the Arden Park neighborhood had sufficient time for interest and participation to begin to propagate appreciably through the neighborhood. Out of the 55 homeowners who showed interest in the program, 91% (50 homeowners) took advantage of the home energy assessment and 27% (15 homeowners) completed energy efficiency retrofit upgrades to their homes. Overall participation rate was 0.8% of all homes, and probably higher for eligible candidates since an unknown number of homes were vacant or rental properties. The average project cost was \$11,268.

To date, 128 homes have received an energy assessment and valuable information and education about the current condition of their home. Again, reasons why there were few retrofits were that 1) customers could not afford them; 2) CHF financing ran out and/or customers were not qualified; and 3) lack of energy savings (or not cost effective) due to recent home improvements.

*Assessments***HERS II - \$99 Assessment**

One objective of SMUD's HERS II program was to offer customers an independent home energy assessment at low cost. Another objective was to help generate a market for HERS II raters and ratings.

Through the program, HERS II Raters were required to charge the customer \$99 to perform the assessment, and SMUD would provide an additional \$400 to the rater on the back end. The assessment informed the customer about the existing condition of his/her home, and provided recommendations to cost-effectively improve the energy efficiency of the home. Furthermore, the HERS II Raters provided a home rating. The rating indicated how the home performed against a newly constructed home under Title 24 (rated at 100); the lower the rating, the more energy efficient the home. After receiving a rating and a list of recommended improvements, the HERS II Rater was to introduce customers to SMUD's Program.

HPP offered generous rebates for completing home energy retrofits. The HERS II Raters were to guide customers to the list of eligible HPP contractors. The HERS II Raters were not allowed to recommend any contractors. Again, the Rater was to be independent. It was then up to the customer to reach out to a contractor and get a bid for the work which the HERS II Rater recommended.

The original goal of the HERS II program was to perform about 3,000 HERS II ratings. At a later time, the goal was reduced to 1,000 because there were challenges with creating a demand for HERS II assessments and having HPP contractors use the assessment to generate a scope of work and a bid.

In order to offer HERS II assessments, SMUD needed to identify interested HERS raters and get them trained on the Whole-House Home Energy Rating. SMUD worked with CalCERTS, an Energy Commission-approved HERS Provider, to identify certified HERS II Raters to do HERS II ratings.

The challenges were: offer necessary training in a timely manner, create a demand for HERS II rating/independent consultation, and align the HERS II assessment with HPP BPI assessment.

The latter represented the biggest challenge. The HERS II assessment did not align well with BPI. HERS II raters were not required to perform combustion safety testing. Also, the HERS II Raters were not required to provide the energy simulation model (BLD file) to the customer. The majority of HPP contractors did not feel the HERS II assessment was adequate enough for providing a work scope and bid in estimating the rebate and felt they had to perform their own assessment in addition to the HERS II assessment.

#### Outcomes:

There were 1,012 HERS II assessments done, which exceeded the goal of 1,000. The HERS II program achieved roughly a 6% conversion rate versus 47% compared to the BPI assessment component. Exceeding the goal was due to a few large HPP contractors who were able to integrate SMUD's HERS II Program into their HPP business model.

For example, some contractors had been referring their interested HPP customers to the HERS II raters to take care of the assessment. This generated a lot of work for a few HERS II raters, and it did not cost the contractor anything. The contractor did not have to invest in doing assessments and take the risk of not making sales. Instead, the HERS II raters performed the assessment and got paid by SMUD. The contractor benefited when the customer was interested in doing the retrofit at which point the customer contacted the original contractor again to get a bid and start work.

Without this contractor business model, the HERS II goal would not have been met.

#### ***HERS II – Community Resource Project (CRP)***

Another objective of the HERS II audits was for CRP to complete 1,050 HERS II ratings of low-income homes receiving state Weatherization Program funds to compare the recommendations with the currently approved DOE rating tool (REM/Rate or NEAT).

CRP performed 680 audits using both the REM/Rate and HERS II rating tools. The data generated by each tool was compared to one another for each audit. After the first 598 audits, the Energy Commission enhanced the data comparison report for CRP to capture additional data points. As a result, the final 82 audits performed provided enhanced data analysis of the two rating tools with the official HERS II rating data transmitted to the CalCERTS registry. During the course of this work, CRP also received field mentoring from CalCERTS to ensure Rater proficiency of the HERS II process. CRP received positive feedback from CalCERTS.

The initial results showed that the two software tools were not easy to compare with one another. Each tool didn't necessarily: recommend the same energy efficiency improvement, collect the same type of data, report data in the same way, and value the existing conditions and measures in the same manner. It was difficult to evaluate the estimated savings because 1) REM/Rate indicated "savings" in terms of dollars savings, and HERS II indicated kW, kWh, Therms, and dollar savings; and 2) the recommended improvements were different. Therefore, it was difficult to accurately compare the "savings." However, these findings will help lay the groundwork to further evaluate the two rating tools to identify which one would recommend the greatest number of energy savings to the homeowners, and to validate the best tool to use in future weatherization audits across California.

#### Outcomes:

CRP achieved 680 assessments (553 through December 2011, 45 in January 2012, and 82 in March 2012).

#### ***HERS II – Sacramento Housing and Redevelopment Agency (SHRA)***

Originally, SMUD entered into an MOU with SHRA to pay for the cost of HERS II ratings on 300 homes that were foreclosed and re-purchased by the Agency. The goal was later reduced to 100 homes due to SHRA's inability to secure the second half of the NSP funding that was anticipated. SMUD issued an RFP to select a single HERS II Rater to work on the Neighborhood Stabilization Program homes.

Prior to beginning work, SHRA's contractor contacted the selected HERS II Rater, the Benningfield Group (Benningfield), to schedule a test-in rating. They provided all of the required documentation to SHRA and SMUD along with an invoice for the test-in. Energy Efficiency R&D staff worked with SHRA's contractor to correctly install the recommended measures to achieve energy savings.

Based on SHRA's calculation, the HERS score improved 35% on average which resulted in roughly \$497 in annual cost savings per home/unit. Upon completion, SHRA's contractor contacted Benningfield to perform the test-out rating. Again, Benningfield provided the documentation to both SHRA and SMUD and billed for the test-out rating.

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Outcomes:

SMUD achieved 172 test-in (and 112 test-out) HERS II assessments.

***Multi-family***

SMUD's Multi-family (MF) program was administered by Heschong Mahone Group (HMG). HMG was tasked with program development and administration, trade contractor solicitation and qualification, implementation and management, field training and mentoring, and marketing. The program utilized HERS II Raters, who assessed the performance of MF buildings, diagnosed energy performance problems, and identified the most effective solutions to those problems.

HERS II rebates were only made available after the program was implemented to increase rating and retrofit activities. The program developed by HMG and SMUD included: a multi-family apartment complex assessment, upgrade options for the multi-family property owner of selected measures, the installation of agreed-upon measures to improve energy efficiency, and verification of the job. Rebates of up to \$3,800 (SMUD only) for 50% improvement could be achieved if large-scale energy savings improvements were made.

Key Activities

The goal of MF program was to save energy and to improve the safety, durability, comfort, and environment of the occupied multi-family units. The MF program retrofit goal was to retrofit 1,500 units. This goal was met — 2,513 units (1,276 ARRA-SEP funded, 1,237 SMUD funded) were retrofitted with energy saving components. Incentives were paid to the contractors based upon 50 percent and 100 percent completion of construction. The contractor-related participation, education, and compliance goals were met, and data collection goals were met through the use of the HMG database. Quality assurance goals were also met. The goal of ensuring swift and effective communication between EUC programs, which was not envisioned in the contract, was difficult to meet. SMUD financing was not available for the MF program.

The process through which retrofit jobs were accepted and completed, and parties involved, is as follows:

- a. MF complex energy assessment (HERS II Rater)
- b. Defining work scope with customer (Contractor)
- c. Completion of EnergyPro energy simulation modeling software (HERS II Rater)
- d. Submission of project EnergyPro modeling to HMG (HERS II Rater)
- e. Pre-retrofit desk check QA (mandatory) by HMG
- f. "Notice to Proceed" letters with retrofit were issued by HMG
- g. Required post-retrofit energy assessment and verification (HERS II Raters)
- h. Post-retrofit QA (10% of the jobs for HERS II raters at random selection)
- i. Submittal and Certification of Payroll (SMUD)
- j. Rebate processing of checks for contractors (SMUD)
- k. Customer survey (HMG)

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Outcomes:

The multi-family program was a huge success with 11,289 initial MF units/HERS II assessments (test-in) completed and 2,513 retrofits (or HERS II test-out ratings) done. With this program, home performance as a method to retrofit MF complexes has become more visible. On average, there were 29% energy savings over the prior building condition. SMUD's HPP -MF program only offered incentives for electric savings. The average rebate amounts varied; where in few cases, rebates were large enough to offset a majority or all of the cost, but in most cases, property owner paid more than half of the retrofit cost, which ranged from \$5,000 to \$10,000 per unit. The average annual energy savings per unit is 2,061 KWh.

***Enhanced Weatherization***

The Enhanced Weatherization program offered SMUD qualified low-income residential customers the opportunity to have their single family homes weatherized, their old, energy inefficient refrigerators replaced with new, efficient models, and for owner-occupied low-income single family homes, have their old, inefficient HVAC units replaced with new, efficient models, all at no cost.

See below for measures installed by vendors/contractors based upon results from a home assessment conducted by SMUD Energy Assessment staff:

Contractor: Empire Insulation

1. Attic insulation
2. Weather-stripping
3. Low-flow showerhead
4. Faucet aerators
5. Water-pipe insulation
6. Compact-fluorescent bulbs
7. Fluorescent torchieres
8. Ceiling fans
9. Hardwired lighting fixtures
10. Water heater insulation

Contractors: Sierra Valley and Champion Industrial

11. HVAC replacement

Contractor: Manuel Joseph

12. Refrigerator replacement

The benefit of the program was to provide long-term energy savings to low-income households, particularly current high energy users. It also provided work for HERS raters and HVAC contractors through the required changeout verifications and implementation of weatherization measures.

Outcomes:

The goals for the program were met as planned.

Given the traditionally oversubscribed demand for Weatherization programs that target low-income customers, goals were easily met. Under this program component, SMUD replaced 1,479 refrigerators, installed 416 HVAC systems, 293 insulation jobs, and completed 257 miscellaneous air sealing/caulking jobs.

### ***Basic Assessment***

The Basic Assessment program was designed to have a competitively-bid selected program administrator (Benningfield) go into SMUD customers' homes, conduct a simple energy assessment on their home and provide the customer with basic energy efficiency measures. Benningfield also educated customers on behavioral changes and informed them of any do-it-yourself measures that customers could do to save energy and money.

SMUD's goal for this program was to have 1,000 assessments completed for a cost of \$500,000. Since the program was completely free to customers and marketing was done by Benningfield, there were few, if any, barriers to achieve the program goals. Customers readily signed up, and Benningfield was able to utilize subcontractors to do the basic assessments on their behalf.

### ***Outcomes:***

Benningfield achieved 998 Basic Assessments and a saving goal of 10% (electric) per household with a total calculated energy savings of roughly 2,900,808 kWh/year overall. Therm savings was excluded as there was no methodology to estimate it.

### ***Workforce Training/Job Development***

The workforce goal of SMUD's HPP was to develop training partners' capacity for HPP in order to support near term contractor training needs for program participation and establish a workforce development training infrastructure to preserve or create jobs for the HPP pipeline. Total full time employee (FTE) jobs created or saved for HPP was estimated at 745 based on a running total of hours worked per DOE's Federal ARRA 1512 equation.

The goal utilized a three-part strategy:

1. Creating sufficient market demand to attract prospective students to training programs and attract recent graduates to performance and prescriptive level program work;
2. Marketing trained and certified contractors to customers interested in performance and prescriptive level program work; and
3. Partnering with regional workforce stakeholders to provide networking solutions for recent training graduates to get employed quickly.

In partnership with CBPCA, ConSol, Build It Green, Los Rios Community College District, and other subject matter experts, SMUD developed training curriculum, marketed training, and implemented training.

Specifically, funding was provided to SMUD and the following workforce subcontractors to develop training and reporting: Build It Green to develop BPI certification courses for contractors, and Los Rios Community College District to develop BPI certification courses to contractors.

### *Build It Green*

HPP provided \$49,919 to Build It Green to accomplish the following:

1. Procure Building Performance Institute (BPI) certified curriculum, evaluate and adapt for local training.
2. Perform course planning and development.
3. Become a BPI affiliate training organization, which includes the purchase of annual curriculum license and BPI fees.
4. Purchase of home performance diagnostic equipment and other teaching tools.
5. Train associate trainers.
6. Implement four BPI training events over 18 months, training 40 contractors per event.
7. Proctor BPI field tests for 120 trainees.

Build It Green committed \$360,000 in leverage funding to SMUD.

Prior to HPP agreement's effective date, Build It Green performed the following tasks prior to the signing of any SEP ARRA primary or sub-agreements. These accomplishments *cannot* be counted toward grant achievements. They procured BPI certified curriculum, evaluated and adapted it for local training. They also performed course development.

After the agreement was signed, Build It Green accomplished the following goals.

1. Became a BPI affiliate training organization, which included the purchase of annual curriculum license and BPI fees.
2. Purchased home performance diagnostic equipment and other teaching tools.
3. Recruited four BPI-certified trainers to become BPI test proctors for Build It Green.
4. Implemented two BPI training events over 18 months, training a total of 93 students (35 passed BPI written exam, proctored BPI field tests for 29 trainees/21 passed BPI field exam, and 21 became BPI certified).
5. Training series dates were Nov. 8-10 & Dec. 13-15, 2010 and March 1-3 & 22-23, 2011
6. Provided \$219,451 in leverage funding to SMUD.

### *Los Rios Community College District*

The HPP contract provided \$399,300 to Los Rios Community College District to accomplish the following:

1. Procure Building Performance Institute certified curriculum, evaluate and adapt for local training.
2. Perform course planning and development.
3. Become a Building Performance Institute affiliate training organization, which includes the purchase of annual curriculum license and BPI fees.
4. Purchase of home performance diagnostic equipment and other teaching tools

5. Train and prepare 80 students to work within the home performance field as HERS raters, BPI contractors, and other supporting construction roles of the home performance industry.

Los Rios Community College District committed \$77,836 in leverage funding to SMUD.

Los Rios Community College District accomplished the following goals.

1. Became a Building Performance Institute affiliate training organization, which included the purchase of annual curriculum license and BPI fees.
2. Purchased home performance diagnostic equipment and other teaching tools.
3. Implemented 165 BPI training events over 18 months, training a total of 74 students.
4. Proctored BPI field tests for 51 trainees.
5. Job Placements: 31
6. Provided \$77,836 in leverage funding to SMUD.

*Outcomes:*

Based on Federal DOE ARRA 1512 report equation, SMUD achieved a running total of 745 FTE jobs created or saved throughout the HPP contract.

***Marketing***

The marketing creative design and strategy was developed by Ogilvy Worldwide in conjunction with SMUD's Marketing and Graphic team. SMUD secured the services of Wallrich and Landi to develop and manage the final version of HPP website.

SMUD and Ogilvy conducted extensive qualitative and quantitative research to obtain customer and contractor feedback on program design and nomenclature, understand customer motivations and barriers, and determine directional ideas for creative development and messaging.

Qualitative focus groups were conducted among seven different targeted customer segments. Two creative designs with a total of five executions were tested. The creative concepts that appealed to the greatest number of customers in each segment group (below) were the foundation for HPP creative direction and applied to all projects under the Home Performance umbrella. SMUD's marketing budget was \$1.6 million which included ARRA-SEP funds and SMUD leveraged funds.



## Marketing Strategy

### HPP Single Family:

In an effort to drive customers from awareness to participation, SMUD implemented a three-phased approach to the marketing strategy:

- Phase I (soft launch-awareness) July 23, 2010 – September 26, 2010
- Phase II (awareness) September 27, 2010 – December 17, 2010
- Phase III (awareness, participation) February 28, 2011 – January, 31, 2012

The aggressive multi-media marketing approach included activation in the following channels:

- SMUD Bill Package
- Collateral - Brochures, Fact Sheets
- Community Events
- Contact Center
- Digital Media – display, search
- Direct Mail
- Email Marketing
- Events & Trade Shows
- IVR – automated phone system
- Outdoor
- Partnerships
- Print
- Radio
- Social Media / Facebook
- Sweepstakes Project
- Videos
- Website: [smud.org/homeperformance](http://smud.org/homeperformance), EUC site

Marketing efforts under the multi-family approach were targeted to community events, direct mail, website, and print. Marketing efforts under the neighborhood approach utilized an aggressive grassroots effort including participation in community events and neighborhood associations, direct mail, door hangers, yard signs, and articles in local publications. Marketing efforts for the weatherization program included direct mail and outreach by the SMUD team and partner organizations. SMUD supported the marketing efforts that were conducted through contracted vendors.

Measurement and tracking:

SMUD utilized a variety of tools to measure and monitor success:

- Database management system to track rebate and loan fulfillment
- Google Analytics
- Call-center tracking
- Contractor performance reports
- Research surveys
- Perception Tracker

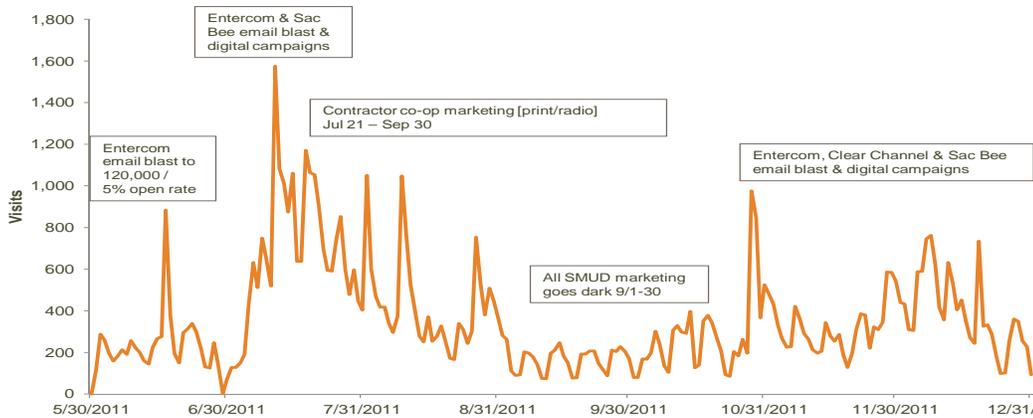
Outcomes:

Program	Assessments	Upgrades
HPP Single Family (Including Neighborhood)	2,709 (BPI) and 1,864 (HERS II)	1,095 Homes
Multi-family	11,289 Test-In/2,513 Test-Out	1,276 Units ARRA-SEP funded; 1,237 Units SMUD funded
Basic Assessments	998	NA

Results of tracking SMUD marketing activity through Google Analytics is captured below.

## Marketing and Web Activity

HPP.SMUD.org



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## CONCLUSIONS

SMUD's HPP successfully worked to transform the market in moving residential customers from individual measures to a whole home approach for energy efficiency, and in developing a workforce to enable and drive adoption of the new model. Below are the milestones achieved through the program:

- Job Creation / Workforce Development and Training
  - More than 200 contractors and students trained through Building Performance Institute, Los Rios Community College District, and Build It Green
  - 745 full-time employee jobs created/saved based on running total per Federal DOE ARRA 1512 equation.
- Single Family Home Assessments and Retrofits
  - 1,095 (50 Prescriptive and 1,045 Performance) single family homes completed construction
  - 2,709 single family contractor energy assessments
  - 1,864 HERS II ratings
- Enhanced Weatherization Assessments, and Retrofits and Number of Measures Installed
  - 2,000 weatherization energy assessments
  - 2,000 retrofits with 2,445 measures installed
- Basic Assessments
  - 998 basic assessments
- Multi-Family Home Assessments and Retrofits
  - 11,289 Test-In and 2,513 Test-Out HERS II energy assessments
  - 48 building projects with 2,513 units completed construction (1,276 ARRA-SEP funded and 1,237 SMUD funded)

HPP increased energy efficiency and peak energy reduction in single family homes, and made the market and end user more aware of home performance/whole building performance. The program also transformed the building retrofit market from individual contractor trades to “whole building” contractor approach by providing customers with a bundled ‘one-stop’ approach to whole-house energy-efficiency as opposed to single measure transaction.

The approach lowered the cost of the initial assessment to provide greater customer access. HPP also increased contractor competency to deliver high quality retrofits and made energy efficiency savings accessible to all customers. In addition, the program also provided and facilitated job growth through developed infrastructure to deliver the highest quality contractor education and training. Through HPP, SMUD was able to obtain valuable insights to customer and building demographics to plan future energy efficiency programs.

Below were some key observations and lessons learned from this project.

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*Observations and Recommendations:*

New programs, such as HPP, require time to plan to gain traction. Larger contracting firms that were more sophisticated and had larger administrative staff had a distinct advantage as program participants over smaller and less sophisticated firms that required more time to gain internal efficiencies.

Starting early with marketing and partnering with other organizations and efforts to get the word out regarding the program helped participating contractors sell jobs, such as engaging with EUC.

Financing options did provide a boost to participation, as evidenced by the single family retrofits completed under the CHF program. The current recession had diminished the value of apartment complexes, and thus provided few incentives to invest in the properties. Some financing options for the multi-family program would have increased participations.

The independence of HERS II raters complicated the single family program due to the disconnect between the rating and the contractors felt they could use the information to provide a bid without additional assessment. Because homeowners generally wanted to have multiple bids on projects as large as a home energy efficiency retrofit, rules needed to be established to ensure that contractors and homeowners understood how information from assessments may be transferred from one contractor to another. In the multi-family program, HERS II raters were often left free to initiate their own fee arrangements with the property owners, and often they would have an economic interest in the final performance estimates.

It was very helpful to jump-start the programs as it allowed contractors to cost effectively get their foot into the door and offer comprehensive assessments. Receiving a customer-friendly assessment report helped with customer education – customers were able to go through the report, learned about their homes, asked questions, etc. From a program management standpoint, it was important to monitor the conversion rate (assessments to retrofits). If monitored properly, contractors could be prevented to turn the program into an assessment-only program. SMUD had success with tracking and managing contractors and conversion rates.

A neighborhood approach could be capable of increasing market penetration. Given enough time, more people would have been interested in the program. In the pilot neighborhood, Arden Park, the neighborhood approach achieved significantly higher penetration than the mass market program. Concepts learned in the neighborhood program could be applied to other similar complex and costly utilities programs as a possible means of achieving a higher market penetration rate. There were clear advantages to geographic targeting.

It's important to spend time and effort identifying neighborhoods with active neighborhood social networks, such as homeowners associations in which a significant number of homeowners were actively engaged. SMUD did this. It was useful to have existing neighborhood communication channels to reach homeowners and facilitate conversations about the program, supplementing other marketing strategies such as yard signs, door knob hangers, direct mailers,

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community events, meet the contractor meetings and new media (web based channels and third party websites).

The ability to move fast was critical if total time was limited for a neighborhood HPP. Policies and procedures for contracting processes, approvals, and checks and balances should be well outlined and streamlined to ensure that adequate time could be provided for the program to achieve its potential levels of adoption.

*Lessons Learned:*

The program requirements for some components such as single family and multi-family, hindered program participation, because they were complex and new to most contractors.

Having two fundamentally different options (Performance and Prescriptive) was unnecessary.

The ARRA program procedures, requirements, and expectations should be made as clear as possible from the beginning of the program, and they should be left undisturbed for as long as possible to reduce the need for program participants to learn new rules and to provide fewer reasons to grant exceptions to those rules and requirements.

Programs that required intermediaries (e.g., contractors) to communicate rules to clients (e.g., homeowners) required that intermediaries be trained how to and what to communicate with their clients to ensure consistency. Programs that required participants to use new types of technology required that special attention be made to training those participants how to use those technologies.

HPP-MF required Davis Bacon Act (DBA) compliance which had significant requirements and interpretation also required significant administrative efforts. In the future, the DBA part of the program should be understood from the very beginning and proper training should be provided to ensure success.

Utility support and involvement in homeowner outreach and education was key. The utility provided existing community contacts, marketing outreach support and program validation. Direct marketing provided by the utility was critical to facilitate sustained outreach and education but was secondary to word of mouth.

Assessment subsidies should not be too high or too low. An effective subsidy would require contractors to charge the customer a small fee for the assessment. This helped filter customers – customers that were genuinely interested in the program and/or their home's energy performance would pay a small fee to take the first step. Post-ARRA programs are now able to use the established infrastructure to reduce the subsidy and be cost-effective.

Adoption took time. Homeowners needed time to absorb the information before committing, and all but the early adopters needed significant time to be convinced by the experience of a peer that the service provided the promised benefits. Nine to 18 months was found to be inadequate for

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this to occur. Two to three years would probably be needed for adoption to spread to anywhere near its full potential in a neighborhood.

*Best Practices:*

Encourage regular and meaningful communication between contractors and clients: It was vital that contractors communicate meaningfully and often with their clients about the program and its various components.

It was also vital to communicate program differences between utilities (e.g., SMUD and PG&E programs and timing of rebate checks), and other mid-program changes or flowdowns (e.g., SHPO requirements). As a partial remedy, SMUD provided to contractors a “Top 10 List for Homeowners” document that could be distributed to SMUD customers to inform them about the program and how it worked.

Provide supplemental training to the standard BPI training: continuing education classes and in-field practice should be required for contractors who needed more training. While no class could teach a contractor everything she/he should know, such education would expose them to what they did not know, which was tremendously important from a safety perspective. Indeed, particular attention during the training should be paid to issues surrounding combustion safety and how to protect homeowners and their homes from unsafe conditions.

Provide supplemental training for contractors on the technological requirements of the program: large and small group classes and individual mentoring to teach contractors how best to use the Job Reporting Template (JRT) and EnergyPro should be part of any program.

One of the quality assurance methods that SMUD used for HPP was to conduct a post-assessment customer satisfaction survey. The survey was completed by 343 customers who had assessments done between June 2011 and January 2012.

SMUD is proud to say that customer perception of the overall HPP was positive.

Customers said they were interested in the program because they wanted to be more energy efficient and save money on their bill. Most customers also said that getting a rebate or incentive for the assessment was very important to them.

Overall, the program was received with much enthusiasm and 87% of the customers said they would recommend the program to their friends and family.

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## **TECHNOLOGY**

HPP utilized various technology solutions for disseminating information, communicating with its sub-contractors and marketing. For marketing, SMUD ran radio ads, bill inserts and bangtails. Marketing ads were selected through a focus group process. The approved ads then ran on radio stations and used as inserts. The original webpage went live on March 9, 2011. SMUD launched its improved website on June 23, 2011(at [www.smud.org/homeperformance](http://www.smud.org/homeperformance)). SMUD also launched an internal HPP website located at [www.smud.org/en/residential/home-performance/pages/default.aspx](http://www.smud.org/en/residential/home-performance/pages/default.aspx).

Build It Green (BIG) created a publication that included course description for BPI Building Performance Training (with Green Home Performance). This information could be accessed from the following website: [www.builditgreen.org/bpi-analyst/](http://www.builditgreen.org/bpi-analyst/).

BIG worked with SMUD to advertise and host the Certified Green Building Professional (CGBP) and BPI Building Analyst Training and to develop collaborative relationships with SETA and Los Rios Community College District to prepare student to qualify, fill and deliver the above trainings. BIG and Performance Services Academy also created a binder/notebook for the BPI Building Analyst Training.

**DELIVERABLES: Provide a list deliverables under the contract, including a brief description, due date and date of delivery.**

<b>Deliverable</b>	<b>Brief Description</b>	<b>Due Date in Agreement</b>	<b>Date Delivered to CEC</b>
1.1	An Updated Schedule of Deliverables	9/30/10	9/30/10
	An Updated Gantt Chart	9/30/10	9/30/10
	An Updated List of Leverage Funds	9/30/10	9/30/10
	An Updated List of Permits	N/A	N/A
1.2	CPR Report - first	2/28/11	3/1/11
	CPR Report – second (optional)	8/30/11	8/29/11
	CPR Report – final	12/30/11	Cancelled per CEC
	Other CPR deliverables as identified in SOW	Ongoing	4/27/12
1.3	Written documentation of meeting agreements and all pertinent information	4/24/12	4/24/12
	Schedule for completing closeout activities	3/16/12	2/23/12
1.4	Monthly Progress Reports, including minutes and program status updates	Monthly	Monthly
	Invoices for all allowable project expenses, including backup	Monthly	Monthly
1.5.1	Draft Outline of the Final Report	1/6/12	12/19/11
	Final Outline of the Final Report	1/13/12	N/A
1.5.2	Draft Final Report	3/16/12	3/16/12
	Final Report	4/13/12	4/30/12
1.6	Letter regarding leverage funds	10/6/10	10/6/10
	Letter(s) for new leverage funds (if applicable)	Ongoing	4/30/12
	A copy of each leverage fund commitment letter	10/6/10	10/6/10
	Letter that leverage funds were reduced (if applicable)	Ongoing	2/29/12
1.7	A letter documenting the permits or stating that no permits are required	9/30/10	9/29/10
	An updated list of permits as they change during the term of the Agreement	N/A	N/A
	An updated schedule for acquiring permits as it changes during the term of the Agreement	N/A	N/A
	A copy of each approved permit (including air quality) and any documents prepared pursuant to CEQA	N/A	N/A
1.8	A letter requesting exemption from the Electronic File Format (if applicable)	N/A	N/A
	Filing of reports and invoices in electronic format	Ongoing	4/30/12
1.9	Copies of Applicable Wage Determinations	Ongoing	3/28/12
	Weekly Certified Payrolls	Ongoing	3/28/12
1.10	Consultant Packages	Ongoing	3/10/11

1.11	Waste Management Plans	Ongoing	3/11/11
2.1	Draft Implementation Plan	10/27/10	10/27/10
	Final Implementation Plan	6/1/11	6/7/11
	Program Implementation Schedule	6/1/11	6/7/11
	Detailed Program Budget	6/1/11	6/7/11
	Copies of Contracts with all subcontractors that are receiving ARRA SEP funding, including contribution of leverage funding and/or sub-grants from those subcontractors	11/3/11	11/3/11
	Copies of MOUs, contracts or sub-grants with all partners that are not receiving ARRA SEP funding, including commitments to provide leverage funding, and in-kind services	11/3/11	10/6/10
	Program partner tracking and reporting	3/15/11	Cancelled per CEC
	Implementation status of the levels or components of HPP specified in the SOW	Monthly	Monthly
	Coordinated training schedules and workforce deployment	Monthly	Monthly
	Schedule of reporting requirements and deadlines	10/29/10	10/29/10
	Davis-Bacon Act compliance report, if applicable	10/29/10	Weekly
	Accounting templates	10/29/10	Monthly
	Monthly and final accounting reports	Monthly	Monthly
	Monthly risk management reporting	Monthly	Monthly
2.2	Prescriptive program plan, performance goals and strategies	11/3/10	11/3/10
	Prescriptive budgets, metrics, and reports	11/3/10	11/3/10
	Prescriptive rebate form	11/3/10	11/3/10
	Prescriptive contractor requirements summary	11/15/10	11/3/10
2.2.1	Prescriptive monthly performance data	Monthly	Monthly
	Contractor work verification and metrics and savings reporting	Monthly	Monthly
	Prescriptive Program evaluation report	Monthly	Monthly
	Final Evaluation Report	3/30/12	Included in the Final Report
2.3	Performance program plan, performance goals and strategies	11/15/10	11/3/10
	Performance budgets, metrics, and reports	11/15/10	11/3/10
	Performance rebate form	11/15/10	11/3/10
	Performance contractor requirements summary	11/15/10	11/3/10
2.3.1	Performance monthly performance data	Monthly	Monthly
	Contractor work verification and metrics and savings reporting	Monthly	Monthly

	Performance Program evaluation report	Monthly	Monthly
	Final Performance Program Evaluation Report	3/30/12	Included in the Final Report
2.4	Neighborhood program plan, performance goals and strategies	11/15/10	11/15/10
	Neighborhood budgets, metrics, and reports	11/15/10	11/15/10
	Neighborhood rebate form	11/15/10	11/15/10
	Neighborhood contractor requirements summary	11/15/10	11/15/10
2.4.1	Neighborhood monthly performance data	Monthly	Monthly
	Contractor work verification and metrics and savings reporting	Monthly	Monthly
	Neighborhood Approach Program evaluation report	Monthly	Monthly
	Final Evaluation Report	3/30/12	Included in the Final Report
2.5	HERS II program plan, performance goals and strategies	8/19/11	8/18/11
	HERS II program budgets, metrics, and reports	8/19/11	8/18/11
2.5.1	HERS II monthly performance data	Monthly	Monthly
	Final HERS II Program Evaluation Report	4/30/12	Included in the Final Report
2.5.2	Reporting mechanism for home ratings	8/19/11	Monthly
2.5.4	HERS II monthly performance data	Monthly	Monthly
	Contractor work verification and metrics and savings reporting	Monthly	Monthly
2.6	Multi-family program plan, performance goals and strategies	8/19/11	8/18/11
	Multifamily program budgets, metrics, and reports	8/19/11	8/18/11
	Multifamily contractor requirements summary	8/19/11	8/19/11
2.6.1	Multi-family monthly performance data	Monthly	Monthly
	Contractor work verification and metrics and savings reporting	Monthly	Monthly
	Multifamily Approach Program evaluation report	Monthly	Monthly
	Final Multi-family Evaluation Report	3/30/12	Included in the Final Report
2.7	Basic Assessment program plan, performance goals and strategies	8/19/11	8/19/11
	Basic Assessment program budgets, metrics, and reports	8/19/11	8/19/11
	Basic Assessment Checklist and package of measures	8/19/11	8/19/11
2.7.1	Basic Assessment monthly performance data	Monthly	Monthly

	Contractor work verification and metrics reporting	Monthly	Monthly
	Final Basic Assessment Satisfaction Report	3/30/12	3/14/12
2.8	Marketing and outreach materials for all program components	8/12/11	8/19/11
	Marketing and participant recruitment performance data	Monthly	8/18/11
	Marketing services evaluation report	Monthly	8/18/11
	Final Marketing Services Report	3/30/12	Included in the Final Report
2.9	Training Curriculum	2/2/12	2/2/12
	Jobs training and placement data	Monthly	Monthly
	Final post training evaluation report	3/30/12	Included in the Final Report
3.0	Marketing Enhancement Activity Plans	8/19/11	N/A
	Co-op marketing plan and contractor participation agreement	8/19/11	7/21/11
	Interest rate buy-down and/or loan loss reserve procedures and implementation plan	8/19/11	N/A
	Monthly single family performance data	Monthly	Monthly
	Monthly multi-family performance data	Monthly	Monthly
	Monthly program progress and risk assessment reports	Monthly	Monthly

*\*\*NOTE: If Date of Delivery to CEC is more than one month later than the original Due Date in Agreement, provide an explanation.\*\**

**BUDGET: Provide your approved budget under the contract, including budget category or deliverable, a brief description, budget amount and actual expenditure.**

<b>Budget Category or Deliverable</b>	<b>Brief Description</b>	<b>Budgeted (ARRA)</b>	<b>Actual Expenditure **</b>
1.0	Administration		
1.2	CPR Meetings	\$1,480	\$1,426
1.4	Monthly Progress Reports	\$217,511	\$217,503
1.5	Final Report	\$27,273	\$28,233
1.9	Prevailing Wage Determination	\$60,610	\$59,711
	Total Administration	\$306,874	\$306, 872
2.0	Program Development and Management		
2.1	Overall HPP Dev. and Mgmt.	\$902,206	\$900,336
2.2	Single Family Level Program Dev. and Mgmt.	\$7,872,310	\$9,132,318
2.3	Neighborhood Approach Program Dev. and Mgmt.	\$1,127,533	\$256,554
2.4	HERS II Program Dev. and Mgmt.	\$1,361,766	\$665,343
2.5	Multifamily Approach Program Dev. and Mgmt.	\$3,967,603	\$4,650,556
2.6	Basic Assessment Program Dev. and Mgmt.	\$562,483	\$489,554
2.7	Marketing	\$1,419,427	\$1,217,523
2.8	Workforce Development and Training	\$449,219	\$350,363
	Total Program Dev. and Mgmt.	\$17,662,547	\$17,662,549
	** Per contract amendment 12/2011		
	<b>GRAND TOTAL</b>	<b>\$17,969,421</b>	<b>\$17,969,421</b>

**\*\*NOTE: If expenditure is off by 5% of the budgeted amount, please explain. \*\***

- 1) Task 2.2: The single family retrofits came in at a much higher rebate amount (\$3,186/home, not \$2,400/home as originally planned).
- 2) Task 2.3: The Neighborhood Approach Program did not generate as much interest among consumers as the Single Family and Multi-family components. The funds were reallocated to other line items.
- 3) Task 2.4: CRP was not able to fully expend their contract amount.
- 4) Task 2.5: The Multi-family component was overspent. Funds from the Neighborhood Program and HERS II were used for this component to spend out the budget.
- 5) Task 2.6: The Benningfield Group achieved 99.8% of the goal and under-spent their budget. SMUD labor charges were also under-spent. The leftover funds were reallocated to other line items.
- 6) Task 2.8: Workforce Development and Training was not spent out completely due to decreased trainings and the short time frame to train new students. Due to the semester system, less classes were provided in the time frame than could have been provided if more time was allowed. Excess funds were reallocated to other line items.