Evaluation of 2004-2005 Designed for Comfort: Efficient Affordable Housing Program

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1. Executive Summary

This draft report presents the results of the evaluation of Heschong Mahone Group's (HMG) 2004-2005 Designed for Comfort (DfC): Efficient Affordable Housing Program.

1.1 Overview

The 2004-2005 DfC Program worked within the affordable multifamily and single-family housing sectors to incorporate strategies that involve both long-term changes in market structure and shorter-term acquisition of energy savings. The main policy component of the program involved the development of an Energy Efficiency-Based Utility Allowance (EEBUA), which was designed to encourage targeted property owners/developers to implement energy efficiency improvements at their properties. The way the EEBUA works is somewhat complicated, but essentially it attempts to compensate owners/developers for making energy efficiency improvements by allowing them to charge higher rents. Tenants also benefit in that lower utility bills should more than compensate for the increase in rent.

In addition, there was a financial incentive component of the program that was designed to encourage the adoption of energy efficiency measures in both multifamily and single-family voluntary rehab housing projects. In the multifamily component, incentives were provided for improvements in the efficiency of heating, cooling, and domestic hot water (DHW) systems. Projects were required to include an appropriate mix of measures to reduce energy use by at least 20% in these three systems. The program worked with HERS raters and Energy Consultants to identify appropriate measures, simulation programs were used to estimate the reduction in energy use, and pre- and post-inspections were required to ensure that all measures were installed to the correct specifications.

The single-family component of the program also offered financial incentives for incorporating energy efficiency improvements into voluntary rehab projects. The program worked with organizations such as Rebuilding Together to identify projects, offer up to $2,500 in financial incentives per home, and provide training on how to conduct energy audits and identify cost-effective energy efficiency opportunities. The DfC Program also required inspections and final verification visits in order to receive the incentive payments.

1.2 Evaluation Objectives and Approach

The evaluation of the DfC Program included both impact and process evaluation components:

- The *process evaluation* assessed the overall level of performance of the program, gauged by the acceptance of the program features by the participating housing authorities and eligible property owner/developers.
- The *impact evaluation* involved verifying both energy (kWh and therms) and peak demand (kW) savings attributable to the program.

The DfC Program depends for its success upon the education and cooperation of many parties, particularly public housing authorities (PHAs) and affordable housing owners and developers. Thus, the process evaluation focused on assessing these parties' views of the value of the program within the

context of their core missions and operations. The process evaluation also provides recommendations for increasing the usefulness of the program moving forward.

The impact evaluation approach included on-site verification and engineering modeling to estimate energy savings and peak demand reduction from energy efficiency measures installed through the program. A net-to-gross assessment was also conducted.

1.3 CPUC Evaluation Requirements

This section presents a summary of the results of the research completed to satisfy the relevant EM&V requirements identified in the CPUC Energy Efficiency Policy Manual. The specific requirements and our evaluation results are summarized below:

Objective: Measuring level of energy and peak demand savings achieved per year. The DfC Program achieved significant energy savings in the targeted sector by providing financial assistance to over 20 multifamily housing projects and over 35 single-family voluntary rehab projects. In addition, the program distributed over 1,800 EnergyWise packs to tenants, homeowners and meeting and conference attendees that resulted in additional energy saving benefits. The verification and net-to-gross analysis completed as part of this evaluation suggests that the DfC Program should be credited for about half of its reported electric energy and demand savings accomplishments, and about two thirds of its reported natural gas savings accomplishments.

Table 1-1 provides a high-level summary of the results of the impact evaluation. Appendix A provides the lifetime savings impact evaluation results for each utility as well as the overall program. Our impact evaluation approach conformed to either Option A - Partially Measure Retrofit Isolation for prescriptive measures, or Option D - Calibrated Simulation, depending on the measure evaluated.

Objective: Measuring cost-effectiveness. Table 1-2 shows the program's cost-effectiveness results by utility. As shown, the program Total Resource Cost (TRC) ratios are lower than expected for each utility, as a result of the program's low realization rates for energy savings impacts. Table 1-3 presents program results applying the Participant Test. Again, for the most part, the program proved to be less cost-effective than projected because the incremental costs to the participant were not as low as expected relative to the size of participant benefits realized.

Objective: Providing up-front market assessments and baseline analysis. In September 2004, the evaluation produced an interim summary of the program theory, the program metrics and program performance to-date. The findings in this interim memorandum were based on lengthy interviews with HMG program staff in late July and early August 2004 as well as a review of key program documents. This memorandum included a discussion of the high-level objectives of the program, the barriers that the program faces, and the strategies that the program will use to overcome these barriers. In addition, the evaluation produced an interim summary of a series of non-participant interviews KEMA conducted in mid-2005 to address barriers to participation (including aspects related to both program marketing and design), suggestions for program improvement, and interest in participating in the program at some point in the future.

Table 1-1
First-Year Annual Impacts
2004-2005 DfC Program

Reported Gross Impacts	**Peak kW**	**Annual kWh**	**Annual Therms**
SCE	222.45	138,361	13,453
SCG	203.89	98,637	15,901
SDG&E	106.52	92,622	14,212
PG&E	1,132.13	851,431	46,056
Overall Program (2004-2005)	1,664.99	1,181,051	89,622
Verified Gross Impacts	**Peak kW**	**Annual kWh**	**Annual Therms**
SCE	47.65	48,229	8,148
SCG	21.24	26,540	13,277
SDG&E	63.41	61,304	12,587
PG&E	801.65	627,222	41,453
Overall Program (2004-2005)	933.96	763,295	75,466
Verified Net Impacts	**Peak kW**	**Annual kWh**	**Annual Therms**
SCE	38.12	38,583	6,519
SCG	16.99	21,232	10,622
SDG&E	50.73	49,044	10,070
PG&E	641.32	501,777	33,162
Overall Program (2004-2005)	747.16	610,636	60,373
Realization Rates (Verified Net as Percent of Reported Gross)	**Peak kW**	**Annual kWh**	**Annual Therms**
SCE	17%	28%	48%
SCG	8%	22%	67%
SDG&E	48%	53%	71%
PG&E	57%	59%	72%
Overall Program (2004-2005)	45%	52%	67%

Table 1-2
Program Cost-Effectiveness Results by Utility
2004-2005 DfC Program
(Total Resource Cost Test)

	Evaluation Results	Program Reported	Program Projected
PG&E			
Costs	$881,609	$899,844	$909,704
Benefits	$451,511	$557,046	$498,317
Net Benefits	($430,098)	($342,798)	($411,388)
Ratio	0.5121	0.6190	0.5478
Levelized Cost - Electric	$0.22	$0.22	$0.23
Levelized Cost - Gas	$2.57	$2.62	$2.65
SCE			
Costs	$462,805	$462,805	$698,023
Benefits	$130,957	$143,130	$382,126
Net Benefits	($331,848)	($319,675)	($315,897)
Ratio	0.2830	0.3093	0.5474
Levelized Cost - Electric	$0.15	$0.15	$0.23
Levelized Cost - Gas	$1.76	$1.76	$2.65
SCG			
Costs	$207,463	$209,936	$211,882
Benefits	$117,449	$136,583	$116,191
Net Benefits	($90,014)	($73,352)	($95,691)
Ratio	0.5661	0.6506	0.5484
Levelized Cost - Electric	$0.22	$0.22	$0.23
Levelized Cost - Gas	$2.59	$2.62	$2.65
SDG&E			
Costs	$288,356	$300,625	$294,905
Benefits	$151,534	$190,564	$161,199
Net Benefits	($136,822)	($110,062)	($133,706)
Ratio	0.5255	0.6339	0.5466
Levelized Cost - Electric	$0.22	$0.23	$0.23
Levelized Cost - Gas	$2.60	$2.71	$2.65

Table 1-3
Program Cost-Effectiveness Results by Utility
2004-2005 DfC Program
(Participant Test)

	Evaluation Results	Program Reported	Program Projected
PG&E			
Costs	$536,555	$559,348	$499,948
Benefits	$1,624,887	$1,883,009	$1,740,310
Net Benefits	$1,088,332	$1,323,660	$1,240,362
Ratio	3.0284	3.3664	3.4810
SCE			
Costs	$141,649	$141,649	$383,374
Benefits	$577,817	$611,816	$1,033,825
Net Benefits	$436,168	$470,166	$650,451
Ratio	4.0792	4.3192	2.6966
SCG			
Costs	$134,108	$137,199	$116,574
Benefits	$268,704	$268,034	$248,663
Net Benefits	$134,596	$130,835	$132,089
Ratio	2.0036	1.9536	2.1331
SDG&E			
Costs	$176,082	$191,419	$161,719
Benefits	$668,439	$781,532	$688,123
Net Benefits	$492,357	$590,114	$526,405
Ratio	3.7962	4.0828	4.2551

Objectives: Providing ongoing feedback, and corrective and constructive guidance regarding the implementation of programs. As part of the September 2004 and mid-2005 interim memorandums, the evaluation provided interim feedback on the program's program performance to-date, as well as the process and implementation challenges encountered during the first eight to sixteen months of operation. The results of the interim market assessment, baseline analysis, and implementation feedback have been integrated into the process and impact evaluation findings, which are summarized below.

Objective: Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach. PHAs participated in EEBUA for several reasons that are consistent with the underlying DfC Program theory and approach – to encourage energy-efficiency in affordable housing, to reward owners/developers who built more efficient units, and to make the utility allowances more in line with actual energy costs. A few key barriers, however, threatened the success of the 2004-2005 effort and could impede the success of future efforts. The most prominent barrier to EEBUA adoption during the course of the program was lack of HUD approval. Although DfC Program staff had been working with HUD to obtain approval of the EEBUA concept

since 2002, it was not until early 2006 that a break-through was accomplished and HUD endorsement was established.

In addition, normal time and attention barriers were exacerbated during the 2004-2005 program cycle by cuts in Federal funding for Section 8 affordable housing subsidies. These cuts occurred when DfC Program staff were trying to recruit PHAs to adopt the EEBUA. Understandably, PHA staff attention was not focused on the program during this time.

For these reasons as well as others discussed in the report, the EEBUA adoption process took much longer than expected and, by early 2005, the program was in danger of not meeting its energy savings goals. Initially, the program policy was only to give prescriptive rebates to affordable housing owners/developers who were located in the jurisdiction of a PHA that had adopted the EEBUA. However, to insure it would be able to achieve its energy savings goals in time, the program chose to allow qualifying affordable housing owners/developers to receive the incentives even if their jurisdictional PHA had not adopted the EEBUA. The end result was that most of the program energy savings was achieved in areas where the EEBUA had not been approved.

And, finally, although nine PHAs adopted or approved the EEBUA, no housing projects had started using the EEBUAs with tenants during the 2004-2005 program years. DfC Program staff identified three projects in Yolo County, one in Marin County, one in Monterey County, and one in San Diego that had adopted the EEBUA. The evaluators were able to get in contact with four of these six project developers and found that all of the projects were in construction with occupancy not expected for 1-2 years. However, DFC Program staff pointed out that in these cases the EEBUA had been used to help with the financing of the projects.

Objectives: Assessing the overall levels of performance and success of programs. The DfC Program met its goals in terms of the number of PHAs adopting or approving the EEBUA. The program's goal was ten PHAs adopting or approving and a total of nine PHAs did so with another two PHAs committed to do so in 2006. The program was generally successful in helping participating PHAs communicate the benefits of the EEBUA within their organization and providing ongoing support during the lengthy adoption process. While participating PHAs were generally satisfied with the efforts of the DfC Program, there were some complaints related to the initial lack of clarity about the benefits of the program, aggressive lobbying efforts on the part of the DfC Program staff, and, in one case, delays in providing support after the EEBUA had been adopted.

Resistance among non-participating PHAs to adopt the EEBUA seems to stem from some of these same concerns – some felt the benefits for adopting the EEBUA were not clearly demonstrated to warrant participation, others felt the benefits were outweighed by the administrative burden of maintaining two utility allowances.

Looking forward, the following recommendations were offered by PHAs and DfC Program staff in order to improve the EEBUA adoption process:

- Informational materials that provided a more concise explanation of both how the EEBUA worked and how energy savings would be achieved
- Information that better described the benefits of the program to the PHAs as opposed to the owners/developers

- More case studies;
- Less aggressive lobbying for adoption;
- More marketing of the EEBUA in meetings involving multiple PHAs;
- Make greater use of PHA sector thought leaders;
- Provide more sales pitches that were customized to the particular needs and wants of a given PHA; and
- For some PHAs, making greater use of developers as lobbyists.

Satisfaction with the financial incentive component of the program was generally very high, according to participating owners and developers. Areas of dissatisfaction centered on the delays in obtaining incentive payments and the logistics of identifying qualifying equipment, finding it available in the market, and obtaining qualified contractors to install it. The utilities and third party contractors need to continue to find ways to improve the timeliness of incentive payment process.

Participating HERS raters and energy consultants were also very satisfied with the program, although some difficulties were reported due to the complexity of some of the projects. The fact that most projects were initiated and completed toward the end of 2005 presented challenges for getting the analysis and inspections completed in a timely manner.

The relationships established between owners/developers and HERS raters and energy consultants was beneficial to the program as well as to the individuals involved. Owners/developers came to value the expertise offered by these experts, and the HERS raters and energy consultants found new avenues to expand their businesses. This presented challenges because of the two-year program cycle; many projects were initiated in 2004, but took over 12 months before implementation was complete.

The single-family voluntary rehab housing component of the DfC Program was also generally viewed as a success. Working with organizations such as Rebuilding Together, the program provided financial assistance to 37 homes for the installation of energy efficiency measures such as new heating and water heating systems. The majority of assistance was provided to homes located in PG&E's service territory. DfC Program staff cite lack of staff/resources among the voluntary rehab organizations operating in southern California, as well as (potentially) less need for heating measures and greater interest among organizations working to rehab mobile homes (which were not eligible for the DfC Program in 2004-2005). Some complaints about the program centered on the inspection delays/protocols, lack of clarity regarding eligibility, administrative burden, and lack of installation support.

Objective: Informing decisions regarding compensation and final payments. The results of the impact evaluation, as well as the process evaluation, can be used to inform decisions regarding compensation and final payment. While the evaluation produced realization rates that suggest that only one half to two thirds of the program's reported accomplishments were achieved, we feel strongly that this should not be viewed in isolation when making compensation and final payment decisions related to this effort. First, as mentioned above, the program met or exceeded many of its non-impact related goals in terms of the number of PHAs adopting or approving the EEBUA, providing assistance to participating PHAs to help them communicate the benefits of the EEBUA within their organization, providing ongoing support during the lengthy EEBUA adoption process, and generally providing services that were well received by the target audience.

Objective: Helping to assess whether there is a continuing need for the program. There appears to be a continuing need for the program in that many PHAs have yet to adopt the EEBUA and, with the recent HUD endorsement, it is likely that additional PHAs are likely to get on board in the coming year or two. In addition, although no housing projects had started using the EEBUAs with tenants during the 2004-2005 program years, most (if not all) of these projects were in construction with occupancy not expected for 1-2 years. Therefore, it will be important for the program to continue so that the full benefit of its design can be realized and fully evaluated.

1.4 Report Organization

This section has provided an overview of the DfC Program description, the evaluation objectives and approach, and a summary of the key evaluation results. Subsequent sections of the draft report include:

- Section 2: A detailed program description.
- Section 3: A summary of the process and impact evaluation methods.
- Section 4: Results from the process evaluation.
- Section 5: Results from the impact evaluation.

Appendices contain interview guides and survey instruments used in this evaluation, as well as an interim results memorandum delivered to the DfC Program Manager in September 2004.

2. Program Description

The 2004-2005 DfC Program has a very comprehensive design, working in both the affordable multifamily and single-family housing sectors, and incorporating strategies that involve both long-term changes in market structure and shorter-term acquisition of energy savings. For the sake of clarity, it is useful to break the program description into three separate parts – the adoption of the EEBUA, and financial incentives for energy efficiency upgrades in affordable multifamily properties and single family voluntary rehab projects. We also provide a brief summary of changes in the program from 2002-2003, when it was offered on a more limited, regional basis.

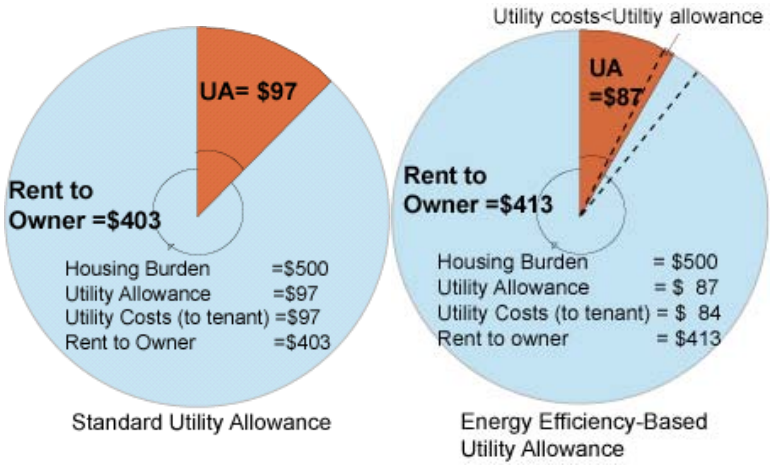
2.1 Adoption of the Energy Efficiency-Based Utility Allowance (EEBUA)

One key component of the DfC Program is trying to persuade Public Housing Authorities (PHAs) to adopt an EEBUA. The EEBUA is an alternative to the standard Utility Allowance used by most affordable housing owner and developers, both in the public and private sectors.

Standard Utility Allowances do not encourage the building of more energy-efficient affordable housing. These allowances are set by PHAs based on surveys of gross average energy costs for affordable housing stock in their geographic areas. Because a large percent of the California multifamily housing stock was built before 1980, average energy costs tend to be much higher than the actual energy costs of new multifamily buildings. As a result, the standard Utility Allowances currently in place do not fairly represent the actual energy costs in newer and more energy-efficient buildings. Because affordable housing residents currently receive the same Utility Allowances in a given area whether their building are energy-efficient or not, owners/developers have little or no incentive to build more efficient structures.

The DfC Program tries to encourage energy efficiency by introducing the EEBUA. The EEBUA can be used in buildings that are significantly more energy efficient than average. If their local public housing authority adopts the EEBUA, owners or developers who achieve certain levels of energy efficiency in their new or existing affordable multifamily properties can collect higher rents. These higher rents are possible because the EEBUA has reduced the tenant's utility allowance to correspond with the reduction in utility costs that have been achieved by the energy-efficiency measures installed in the property. The tenants also receive a small benefit. As the example in Figure 2-1 shows, the reduction in utility costs should be large enough not only to offset the increase in rent, but also leave a few more dollars each month in the tenants' pockets.

Figure 2-1
Example of an EEBUA



Source: HMG marketing materials.

For most of the 2004 program year and a good part of the 2005 program year, the DfC Program spent a large share of its program resources trying to persuade PHAs to adopt the EEBUA. One major challenge of marketing to the PHAs was simply the size of California, with over 100 PHAs to reach and a large geographical area to cover. "I think there are some challenges associated with trying to manage a statewide program and be everywhere at the same time," one program staffer remarked. One way the program tried to increase its range was to train the junior staff so that they could meet with PHAs on their own. The program staff also made presentations at many conferences – such as those for Housing California and the California Affordable Housing Council -- to reach many PHAs at once. However, there were a limited number of such conferences in California in a given year. "If there were more conferences, charettes or seminars that actually brought this housing group together – at least in terms of the marketing, it would be easier," commented one staffer.

The strategies that the DfC Program used to persuade the PHAs to adopt the EEBUA are discussed in more detail in subsequent sections. These strategies included:

- The promise of financial incentives for affordable housing owners/developers within the PHA's jurisdiction;
- Informational materials and even customized presentations to help the PHA directors and staff convince their boards of directors to adopt the EEBUA;
- Free development of the PHA's customized EEBUA schedule;
- The promise of free administrative support in implementing and administering the EEBUA once it was adopted;
- The promise of free seminars on the EEBUA for affordable housing owners/developers once the EEBUA had been adopted;

- Letter of support for the EEBUA concept from affordable housing owners/developers in the area; and
- An article in a U.S. Department of Housing and Urban Development (HUD) newsletter that described the EEBUA concept as a "best practice.

However, for a number of reasons discussed in subsequent sections, the adoption of the EEBUA by the PHAs took much longer than expected. Therefore, in early 2005, the program design was changed. Initially the program policy was only to give prescriptive rebates to affordable housing owners/developers who were located in the jurisdiction of a PHA that had adopted the EEBUA. However, to insure it would be able to achieve its energy savings goals in time, the program chose to allow qualifying affordable housing owners/developers to receive the incentives even if their jurisdictional PHA had not adopted the EEBUA. The end result was that most of the program energy savings was achieved in areas where the EEBUA had not been approved.

2.2 Multifamily Energy Efficiency Projects

Another part of the DfC Program pays financial incentives to owners/developers of affordable multifamily housing for energy efficiency improvements in new construction or retrofit projects. The program also pays financial incentives to HERS raters and other energy consultants to perform the measure specification, energy savings estimation, and installation verification tasks required by the program. To receive the financial incentives, a given project must either:

- Demonstrate improvement over the existing efficiency by at least 20 percent, as verified by a Home Energy Rating Systems (HERS) rater;
- Show that the project is at least 15 percent more efficient than required by California's 2001 Title 24 building standards. This 15 percent gain must be verified by an energy consultant and the DfC Program staff through the use of CEC-approved compliance software; or
- Meet the proposed 2005 Title 24 standards.

Table 2-1 shows the financial incentives offered by the DfC Program in the affordable multifamily sector.

Table 2-1
Financial Incentives Offered by the DfC Program in the Affordable Multifamily Sector

Program Participant Type	Incentive Amount
Owners/Developers of Large Multifamily Housing (9+ units)	$700/unit
Owners/Developers of Small (3-8 units) Multifamily Housing	$1,500/unit
Energy Consultants	$40/unit
HERS Raters	$50/unit

As discussed in the previous subsection, originally the program policy was only to give prescriptive rebates to affordable housing owners/developers who were located in the jurisdiction of a PHA that had adopted the EEBUA. However, slow adoption of the EEBUA led to a change in policy in which qualifying projects could receive the incentives even if their jurisdictional PHAs did not adopt the EEBUA.

2.3 Single-Family Energy Efficiency Projects

Although most of the DfC Program activities focused on the affordable multifamily housing sector, one component of the program did try to improve energy efficiency in the affordable single-family housing sector. According to the DfC Program staff, this component was added in response to requests by voluntary organizations that work on rehabilitating this type of housing.

The DfC Program paid financial incentives of up to $2,500 per address for equipment that would achieve a 20 percent improvement in energy efficiency. Originally the incentives could only be used for equipment costs and the installation had to be done by volunteer labor or as a volunteer service by the contractor selling the equipment. However, difficulty in obtaining qualified voluntary installation services led the program to allow the incentive money to also be spent on installation costs. The DfC Program staff as well as outside consultants performed HERS inspections and final verification visits. The DfC Program staff also provided training sessions to educate the rehab organizations on performing energy audits and determining the most cost effective energy efficiency upgrades.

2.4 Changes from the 2002-2003 Program

Key ways that the 2004-2005 DfC Program differs from its predecessor program include:

- The program is now statewide. The predecessor was only a regional program.
- The budget of the program has increased substantially – from $480,000 to $2.6 million.

New program elements include:

- Financial incentives for qualified tenants and single-family home owners working with Volunteer Rehab Organizations,
- Financial incentives for HERS raters and Energy Consultants,
- Caps on the amount of incentive money that can be distributed to a given Public Housing Authority (PHA),
- Different incentive levels for small and large projects, and
- Energy Efficiency-Based Utility Allowance (EEBUA) administration/implementation services available for PHAs.

The per-PHA incentive cap was not part of the original 2004-2005 proposal but is something that the program requested in a change order.

3. Evaluation Objectives & Approach

The evaluation of the DfC Program included both impact and process evaluation components:

- The *process evaluation* will assess the overall level of performance of the program, gauged by the acceptance of the program features by the participating housing authorities and eligible property owner-developers. The process evaluation will also assess the degree of market penetration.
- The *impact evaluation* will involve measuring and verifying both energy (kWh and therms) and peak demand (kW) savings and will be used to assess the program's success in meeting the energy savings and cost-effectiveness goals provided in the program implementation plan.

The DfC Program depends for its success upon the education and cooperation of many parties, particularly PHAs and affordable housing owners and developers. Thus, the process evaluation focused on assessing these parties' views of the value of the program within the context of their core missions and operations. The process evaluation also provides recommendations for increasing the usefulness of the program to its key constituencies.

The impact evaluation approach included on-site verification and engineering modeling to estimate energy savings and peak demand reduction from energy efficiency measures installed through the program.

The following sections provide more detail on the process and impact evaluation objectives and approach.

3.1 Process Evaluation

The process evaluation of the DfC Program conducted mostly open-ended interviews with a variety of program participants, nonparticipating PHAs, the DfC Program staff, and a couple of HUD officials who were familiar with the DfC Program or the EEBUA concept. Table 3-1 shows the number of process evaluation interviews conducted for each of the interviewee categories. In addition, some process information was gathered from interviews of 25 affordable single-family housing residents that were conducted for the impact evaluation. Table 3-2 shows the different types of information collected for the process evaluation through indepth interviews. Samples of the interview guides are included at the end of the report.

Table 3-1
DfC Program Participants/Experts Interviewed for Process Evaluation

Interviewee Category	# of Interviews Conducted
Participating PHA representative	**8 (representing 7 participating PHAs)**
Nonparticipating PHA representative	**6**
Participating owner/developer representative	**18 (representing 15 participating owners/developers)**
Single-family housing rehab organization representative	**3**
HERS raters and energy consultants	**3**
DfC Program staff members	**8 (representing 4 staff members)**
HUD officials	**2**

Table 3-2
Process Evaluation Information Collected Through Indepth Interviews

Process Issue	Participating PHAs	Nonparticipating PHAs	Participating Owner/ Developers	Single-family housing rehab organizations	HERS raters and energy consultants
Program Recruitment and Information					
How found about program	✓	✓	✓	✓	✓
Motivation for joining program	✓		✓	✓	✓
Program informational materials. Satisfaction with information.	✓	✓	✓	✓	✓
Interaction and communication with DfC Program staff. Satisfaction with program staff.	✓	✓	✓	✓	✓
Program training and education	✓	✓	✓	✓	✓
Energy Efficiency-Based Utility Allowance (EEBUA)					

Process Issue	Participating PHAs	Nonparticipating PHAs	Participating Owner/ Developers	Single-family housing rehab organizations	HERS raters and energy consultants
Understanding of EEBUA and its adoption status	✓	✓	✓		✓
Owner/developer interest in EEBUA	✓	✓	✓		
Reasons for adopting the EEBUA	✓				
Reasons for not adopting the EEBUA		✓			
Process for adopting the EEBUA	✓	✓			
Future plans for adopting the EEBUA					
Process for implementing the EEBUA	✓				
EE Project Implementation Process					
Process of identifying and installing EE equipment			✓	✓	✓
EE equipment performance and energy savings			✓	✓	✓
HERS rating and inspection process. Satisfaction with this process.			✓	✓	✓
Incentive Payment and Paperwork					
Satisfaction with paperwork requirements			✓	✓	✓
Timeliness of incentive payments			✓	✓	✓
Satisfaction with rebate payment amounts			✓	✓	✓
Program Attribution					
Likelihood of installing measure without program			✓	✓	

Process Issue	Participating PHAs	Nonparticipating PHAs	Participating Owner/ Developers	Single-family housing rehab organizations	HERS raters and energy consultants
Overall Program Satisfaction					
Satisfaction with program as a whole	✓		✓	✓	✓
Whether would recommend program to a colleague	✓		✓	✓	✓
Recommendations for program improvements	✓	✓	✓	✓	✓

The interviews with the DfC Program staff covered the following topics:

- Program design and focus, market barriers, program goals;
- Marketing and outreach;
- Internal organization and lines of communication;
- Administrative and reporting responsibilities;
- Program tracking databases;
- Financial incentives;
- Training and education; and
- Assessments of program effectiveness (asked both in 2004 and 2006).

The interviews with the HUD officials covered:

- How HUD became aware of DfC Program and EEBUA concept;
- Impressions of EEBUA concept – advantages and disadvantages;
- Why it HUD took so long to endorse EEBUA concept;
- What changed that got HUD to endorse the EEBUA concept;
- Why HUD has only granted waivers for use of EEBUA concept in new construction;
- Whether HUD will publicize the EEBUA concept among PHAs; and
- Whether the EEBUA concept could be implemented outside of California.

In addition the process evaluation reviewed the program marketing materials, presentations, EEBUA reports, EnergyWise packs, and website. This review was described in a September 2004 process evaluation memorandum. This memorandum also covered the topics of marketing activities; staff

structure, coordination, and communications; program incentives and tools; and program reporting requirements. A copy of this review is included in the Appendix.

3.2 Impact Evaluation

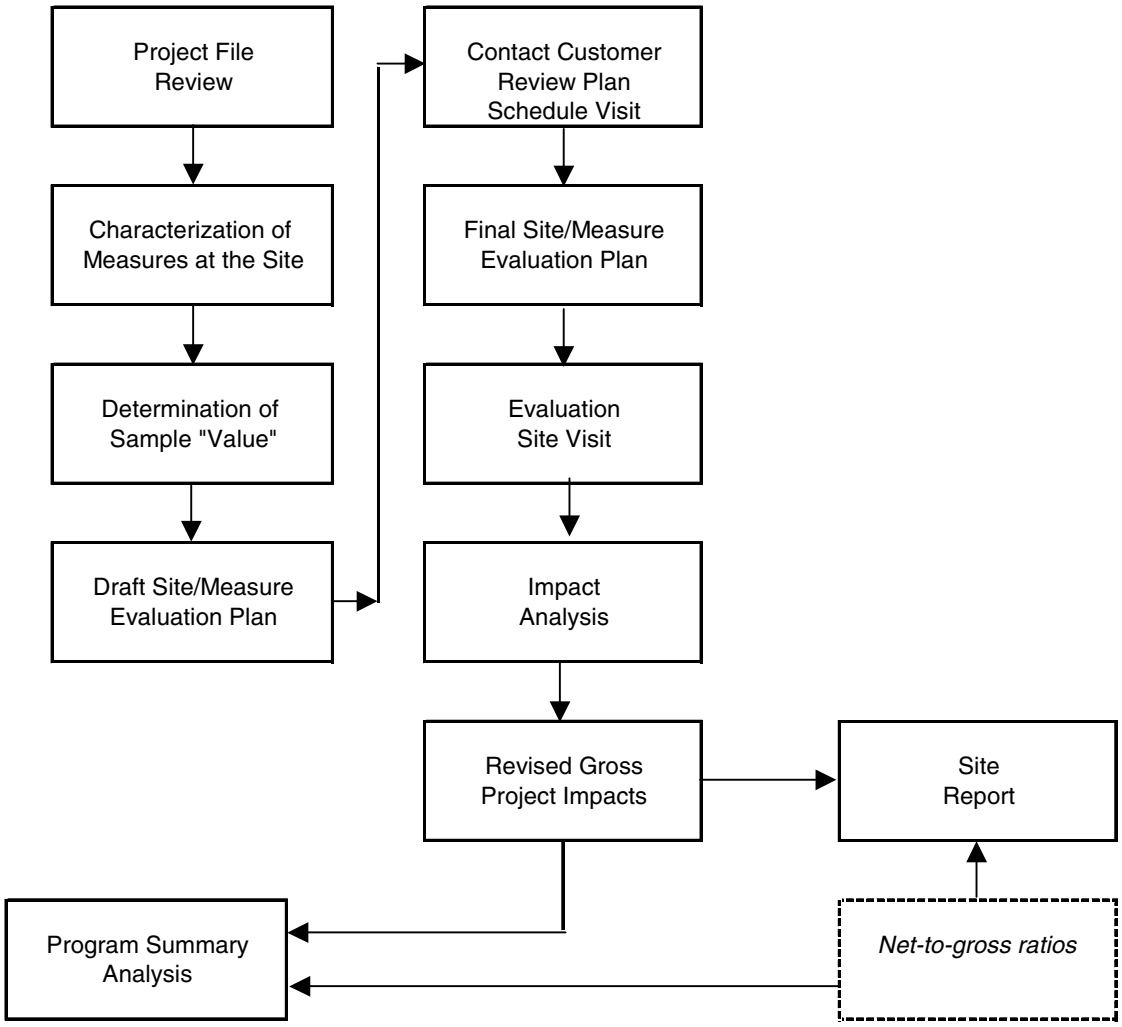
As mentioned above, the impact evaluation consisted of on-site verification and engineering modeling to estimate energy savings and peak demand reduction from energy efficiency measures installed through the program. Specifically, this included:

- Collecting data from a number of participants, agencies, HERS raters, energy consultants and others;
- Collecting and analyzing data concerning building-level and dwelling unit-level measures;
- Collecting pre-/post-installation data concerning building and equipment characteristics (e.g., water heating, insulation, HVAC, controls, etc.);
- Verifying the installation of CFLs and water heating measures distributed to participants in training sessions (i.e., EnergyWise Packs); and
- Developing and/or re-calibrating energy models (e.g., MICROPAS, Energy Pro) to estimate energy savings where appropriate.

Figure 3-1 illustrates our site-based evaluation approach. Key elements of our impact evaluation approach included:

- *Site-specific planning, data collection, and analysis:* review of project files to develop an appropriate evaluation approach; on-site data collection including property owner/manager interviews, verification of performance parameters and installed equipment information, and energy model re-calibration where required.
- *Gross program savings analysis:* aggregating the results of the site analyses and extrapolating these results to the entire program population where needed.
- *Net-to-gross analysis:* determining level of energy efficiency would have occurred without the program through interviews with participating owners/developers.

Figure 3-1
Site-based Evaluation Approach



4. Process Evaluation

The process evaluation of HMG's DfC Program focused on three main components:

- The adoption of the Energy Efficiency-Based Utility Allowance (EEBUA),
- The financial incentives offered to multifamily affordable property owners/developers to make energy efficient upgrades to existing buildings, and
- The single-family program.

4.1 Energy Efficiency-Based Utility Allowance (EEBUA) Adoption

This section contains evaluation findings related to the adoption of the EEBUA. This part of the program reached out to Public Housing Authorities (PHAs) to try to convince them to adopt the EEBUA, and also offered technical assistance and even staff resources to adopting PHAs in order to help them implement and administer the EEBUAs. The following describes key activities and successes relevant to the EEBUA component of the program, as well as areas of concern and suggestions for improvement.

4.1.1 Program Activities

This section discusses the barriers to EEBUA adoption and the strategies used by the DfC Program to try to mitigate these barriers.

4.1.1.1 Barriers to EEBUA Adoption

There were a number of significant barriers that made it difficult for the PHAs to adopt the EEBUA. These barriers included:

- *PHAs were too busy or understaffed to even become familiar with the EEBUA concept.* One of the program's biggest challenges was simply getting the attention of the PHA so that the educational process could begin. According to one program staff member, "the challenges that we face are bureaucratic inertia and trying to get the housing authorities' attention, first of all, trying to get them interested, and sometimes trying to make them understand."
- *Lack of familiarity with the EEBUA concept and Utility Allowances in general.* Even when a PHA agreed to sit down with the program staff to discuss the EEBUA, adoption was often hindered by the fact that the key decision maker did not understand its benefits. One program staff person claimed that most PHA staffers were also unfamiliar with their own utility allowances and some were not even familiar with the concept of energy efficiency.
- *Limits on the applicability of the EEBUA concept.* The EEBUA is not a silver bullet for the affordable housing market. There are many types of affordable housing that either cannot benefit from the EEBUA or where benefits would be very minimal. These include public housing, housing in which a "maximum allowable rent" is calculated based on an area housing burden, very small affordable housing structures that use Section 8 vouchers, and housing where tenants pay for their own utilities. Since most of these housing types would not qualify for program subsidies, PHAs that have a lot of these types of housing do not benefit much from the program. Although most California PHAs do have some housing units that are EEBUA-eligible, the fact

that the EEBUA only benefits a portion of their housing stock makes the program less attractive. This variety in the mix of affordable housing that might exist within the jurisdiction of a given PHA also made marketing the program more difficult. Program staff would often have to customize their presentations and marketing messages to account for this variety.

- *Lack of an explicit HUD endorsement*—Many PHAs want to ensure that the influential U.S. Department of Housing and Urban Development (HUD) endorses any policies concerning utility allowances that they adopt. PHAs are subject to periodic audits from HUD and some are cautious about adopting unendorsed policies for this reason. "If there's a housing authority that got zapped by a housing auditor for whatever reason, even some completely unrelated thing," one HUD official acknowledged, "the next time they try to do something innovative, they're going to look to HUD to put it in writing." In fact two of the PHAs – the San Francisco Housing Authority and the San Joaquin Housing Authority – made the issuance of a HUD waiver for the use of the EEBUA as a precondition for adoption.

4.1.1.2 Mitigating EEBUA Adoption Barriers

Having encountered most of these barriers during the 2002-2003 program years, HMG designed the 2004-2005 DfC Program with strategies for mitigating these barriers. The strategies included encouraging the PHA to adopt the EEBUA by showing support for the concept by public housing trade associations, other PHAs, and affordable housing developers within the jurisdiction of the PHA. The program promoted a HUD newsletter article that identified the program as a "best practice." The 2004-2005 Program also added financial incentives that were originally only available to affordable housing owners and developers within the jurisdiction of a PHA that had adopted the EEBUA. To overcome the time, attention, and staffing barriers, the program offered considerable "handholding" assistance to the PHAs. For example, the program would calculate the EEBUA for each PHA seriously considering adoption, would prepare presentations that PHA staffers could use to sell the EEBUA concept to their boards of directors, and even offered to administer the EEBUA on the behalf of understaffed PHAs.

Table 4-1 matches the PHA barriers to EEBUA adoption and implementation with the program strategies designed to mitigate them.

Table 4-1
Barriers and Program Strategies for EEBUA Adoption by Public Housing Authorities

Barriers to Implementation	Program Strategy
1. PHAs are too busy to even become familiar with the EEBUA concept	• Offering financial incentives that can be used to finance energy efficient (EE) projects in PHA's jurisdiction. Enlisting developers in PHA's jurisdiction to lobby for EEBUA Enlisting public housing trade associations and county housing authorities to endorse EEBUA
2. Many key PHA decision makers are unfamiliar with their own Utility Allowances (UAs) let alone EEBUAs. Many members of the PHA staff are also unfamiliar with the UAs and even the whole concept of energy efficiency.	• Providing general education about energy efficiency, utility allowances, and the EEBUA. • Producing reports showing benefits of EEBUA based on analysis of PHA's existing UA. • Providing EEBUA training for PHA staff.
3. PHAs don't have staff resources to push for EEBUA adoption or administer the EEBUAs once they are adopted.	• Providing presentations and presentation materials to help persuade PHA boards of directors to adopt the EEBUA. • Services for administering EEBUAs on behalf of the PHAs.
4. EEBUA approach only works for a certain percentage of the housing within a PHA's jurisdiction.	• Pointing out eligible housing and generally managing PHA expectations.
5. Each PHA has its own special needs and sales approaches have to be customized.	• Conducting surveys and networking to learn each PHA's situation • Customizing the sales pitches and sales targets appropriately.
6. PHAs who have adopted EEBUAs may fail to actively implement or promote them.	• Conducting regular follow-up with PHAs who have adopted EEBUAs in order to track progress and help them to overcome implementation snags.
7. Some PHAs may be hesitant to adopt the EEBUA because HUD has not explicitly sanctioned it.	• Promoting HUD newsletter article which identifies DfC project as “best practice”

4.1.1.3 Encouraging EEBUA Implementation

Once a PHA decided to adopt or approve an EEBUA, the DfC Program had some additional strategies for encouraging the use of the EEBUA by affordable housing owners and developers in the PHA’s jurisdiction. These included:

- *Owner/developer workshops* – The program offered to conduct a workshop on how the EEBUA would work and its benefits to affordable housing owners/developers in the adopting PHA’s area.
- *Advertisements in relevant newsletters* – The program sometimes put ads in the newsletters of relevant local government commissions and non-profit associations, announcing the adoption of the EEBUA.

However, it is important to note that because many of the PHAs only adopted the EEBUA very late in the 2004-2005 Program's cycle, the amount of post-adoption assistance that the program could provide was inherently limited. In addition, by this time (late 2005) the program staff was full occupied in making sure that all the energy-efficiency projects that the program was rebating were in place before the end of the year.

4.1.2 Program Successes

4.1.2.1 PHA Adoptions

The DfC Program was able to meet and even exceed its goals for the number of PHAs that adopted or approved the EEBUA. The program's goal was 10 PHAs adopting or approving and a total of nine PHAs did so with another two PHAs committed to do so in 2006. Table 4-2 shows these PHAs.

Table 4-2
Public Housing Authorities Adopting or Approving the EEBUA

PHA	Adopted / Agreed to Adopt EEBUA	Adoption Date / Status	Utility
The San Diego County Housing and Community Development Commission	Adopted	December 14, 2004	SDG&E
The City of San Diego Housing Commission	Adopted	[1]	SDG&E
Monterey Housing Authority	Adopted	October 25, 2004	PG&E
Contra Costa Housing Authority	Adopted	October 28, 2004	PG&E
Yolo County Housing Authority	Adopted	December, 2004	PG&E
Marin County Housing Authority	Adopted	June 28, 2005	PG&E
The Community Development Commission of the City of Long Beach	Adopted	September 14, 2005	SCE/SCG
San Joaquin County Housing Authority	Adopted	HUD Approved - Will need assistance in 2006	PG&E
San Francisco Housing Authority	Adopted	HUD Approved - Will need assistance in 2006	PG&E
Glendale Housing Authority	Agreed	Committed to adopt in 2006-2007 funding cycle	SCG
City of LA Housing Authority	Agreed	Committed to adopt in 2006-2007 funding cycle	SCG

[1] The City of San Diego Housing Commission did not need board approval for implementation in their Notice of Funding Availability (NOFA).

Source: HMG program records.

4.1.2.2 Recruiting the Participating PHAs

KEMA conducted eight interviews with representatives of seven of the participating PHAs. KEMA asked them how they heard about the DfC Program and what motivated them to join. Table 4-3 shows that nearly half of the participating PHAs heard of the program indirectly through another city government official. In these cases, the original means of DfC Program outreach is unknown. In the other cases, the PHAs heard about the program directly from the program staff, whether through telephone calls, a letter, or a presentation to a PHA trade association.

Table 4-3
How Participating PHAs Heard About the Program

Source of Program Information	Number of PHAs
City / county government official [1]	3
Telephone call from DfC staff	2
DfC staff presentation to PHA trade association	1
Letter from DfC staff	1
Total	**7**
[1] The source of the original contact about the DfC Program is unknown.	

The representatives of the participating PHAs were also asked what motivated them to participate in the program. As Table 4-4 shows, the main motivations were to encourage energy-efficiency in affordable housing, to reward owners/developers who built more efficient units, and to make the utility allowances more in line with actual energy costs.

4.1.2.3 Participating PHAs' Satisfaction with the Program

KEMA asked the representatives of the participating PHAs to rate their satisfaction with various aspects of the DfC Program as well as with the program as a whole. The interviewees were asked to rate their level of satisfaction using a scale where 1 meant "not at all satisfied" and 5 meant "completely satisfied." They were also asked to explain their satisfaction ratings.

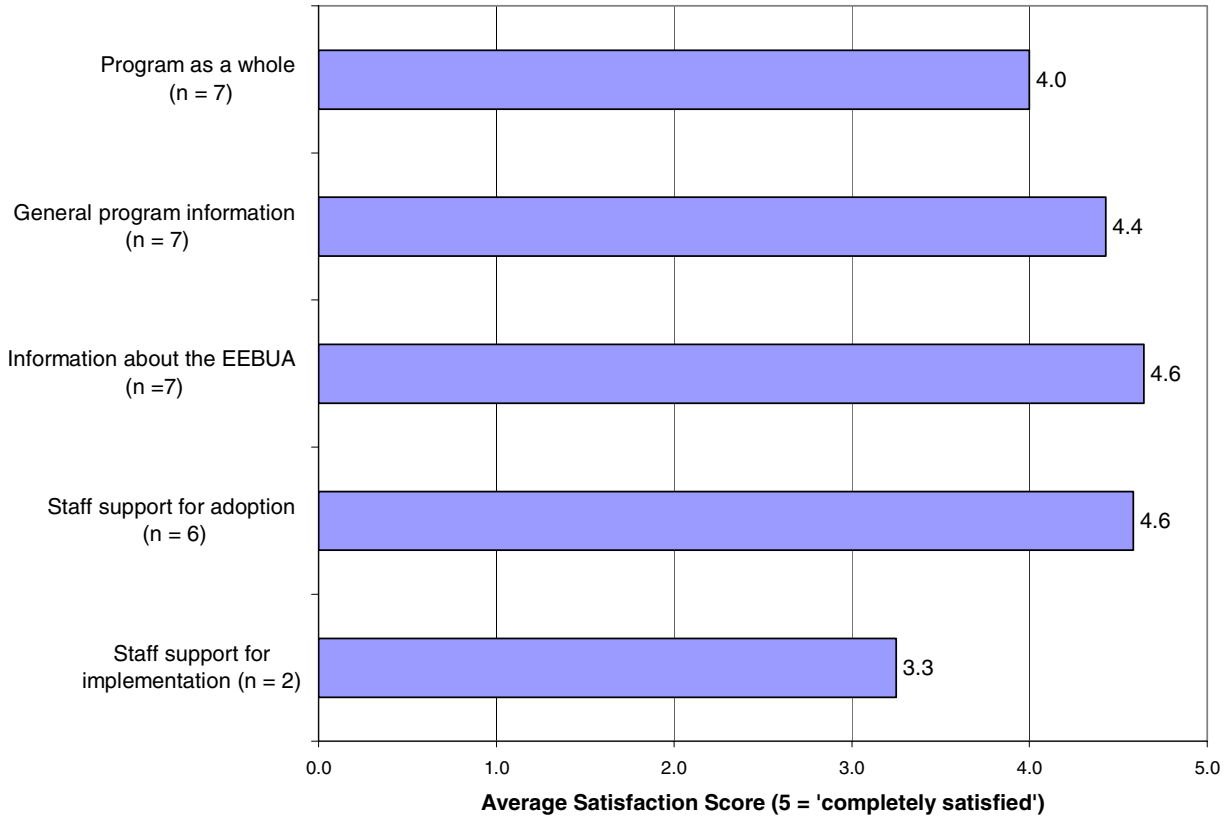
These interviews revealed that the participating PHAs were generally very satisfied with the program's efforts to educate them about the EEBUA concept and push for its adoption. However, as discussed in the next subsection, their assessment of the program's efforts to help them implement the EEBUA was more mixed.

Figure 4-1 shows the PHA satisfaction levels with various aspects of the program. Only two respondents provided a satisfaction rating for the implementation part of the program. This was because the rest felt that this part of the process was not far enough along to make a satisfaction rating meaningful.

Table 4-4
Why Participating PHAs Joined the Program

PHA Interviewee	Motivation for Joining the Program
1	"We were excited about the opportunity to create more sustainable housing and so we incorporated that with our NOFA process."
2	"First it was a good program. It was another tool to help developers include energy efficient components in their developments. Before, the incentive for them to do photovoltaics or any kind of energy efficient thing really wasn't there because the cost savings or the benefits weren't really there. And this program was one more tool to help them recoup their upfront costs quicker. So [our motivations] would be anything to do environmentally and also to help developers get these projects going."
3	"It's in our financial best interest to do it. If we redevelop properties and they base it on our current utility allowance, when you rebuild a new property they are much more energy-efficient than the old property and so we make money. So when we talk about redeveloping another property, we will have this in place before we do that."
4	"Anything that will help our community. If it will encourage development or rehab to bring it up to the level that [the program was] requiring then the [PHA board of directors] will have no problem with it."
5	"It's really mainly an added perk for our owners who then want to participate in our [voucher] program. It really is no great benefit theoretically for a housing authority so much as to give the owners an additional option of why they want to work with the voucher program."
6	"The need to actually make the [utility] allowances more realistic based on the commission of the [affordable housing] units."
7	"I've been in the affordable housing business for many years and it has always been a problem that when we build energy-efficient apartments, the residents who may not pay utilities get a utility allowance that is twice if not three times higher than they are actually paying in utilities. So it's unfair for the owner/developer to not realize the full rental potential because the utility allowance is way in excess of the actual bills. For those developers in the county who are building in excess of Title 24 – who are building energy efficiencies, we wanted to give them a lower utility allowance schedule that they could use for the residents."

Figure 4-1
Public Housing Authority Satisfaction with the DfC Program



A number of the PHAs commended the program in particular for helping them to make an effective presentation in support of the EEBUAs to their boards of directors. In one case, a member of the DfC Program staff actually presented directly to the PHA's board of directors. "She did everything," said the PHA staff person. "All we did is take her to the board and she did the explaining."

The PHAs also gave the program high marks for their ongoing support during the often lengthy adoption process. "We placed calls and sent emails and got immediate responses," said one PHA staffer. "So I can't complain about the service, [the DfC staff person] was always there." Another staff person praised both the responsiveness of the staff and the quality of the information they provided:

> *"The folks were very responsive to any questions I had. They were available to meet with us in person, on the phone, email. They had a lot of good information at their fingertips. They were knowledgeable, accessible, and familiar with the concept. They easily communicated a concept that is complex and were able to communicate that in layman's terms to some people who maybe were not experts in utility allowances."*

4.1.3 Areas of Concern

4.1.3.1 Delays in EEBUA Adoption

Although the DfC Program was able to eventually reach and even exceed its goals for the number of PHAs adopting the EEBUA, this adoption process took much longer than expected. All these delays in PHA approval eventually forced the program to make changes in its original design. Initially the program policy was only to give prescriptive rebates to affordable housing owners/developers who were located in the jurisdiction of a PHA that had adopted the EEBUA. These financial incentives were considered as a reward for those who had adopted and implemented the EEBUA. However, as the EEBUA adoption process dragged on, HMG became concerned that it might not be able to achieve its energy savings goals in time. Therefore, in early 2005, the program was changed to allow qualifying affordable housing owners/developers to receive incentives even if their jurisdictional PHA had not yet adopted the EEBUA. The end result was that most of the program energy savings was achieved in areas where the EEBUA had not been approved.

What had caused these delays in PHA adoption? Interviews with the staff of the adopting PHAs indicated that the delays were caused by the same barriers identified above. The program had identified the correct barriers but these barriers had proven more difficult to overcome than expected. "I think it was a real learning experience," one DfC Program staff person concluded. "It really does take a long time to change policy even at the local level."

The most prominent of these underestimated barriers was the fact that HUD had not given explicit approval of the EEBUA. The San Francisco and San Joaquin housing authorities were the last to approve the EEBUA and their delay was due to the absence of this explicit HUD endorsement. The DfC Program had hoped that an article in a HUD newsletter that described the DfC Program as a "best practice" would serve as a *de facto* endorsement of the EEBUA. However, this proved insufficient for the San Francisco and San Joaquin housing authorities. Only when HUD issued a waiver on the use of EEBUAs in new construction application in January 2006 was the adoption path clear for these housing authorities.

The DfC Program staff had been trying to get HUD to endorse the EEBUA concept as early as 2002. Why did it take HUD so long to do so? Interviews with DfC Program staff and HUD officials indicated that the EEBUA concept may have been "lost in translation." A HUD official who ended up championing the EEBUA explained:

> *"The complexity of what [the DfC staff person] was talking about is really exacerbated because of the terminology. And what I quickly picked up on when he briefed us was that when he was talking about a 2-tier allowance, within the regulatory framework in which utility allowances are set, there's really only one utility allowance schedule. So when people were talking about two tiers, they were all of a sudden thinking of two schedules and they got kind of lost in that abstraction. But when we boiled it down and said: 'No, it's not two schedules – what we're talking about is a different building type and made that case, that's the case that won the day and call it whatever you want to, once we clarified that point it became more operationally successful within the HUD environment".*

The program also underestimated the extent to which normal time and attention barriers were exacerbated by cuts in Federal funding for Section 8 affordable housing subsidies that occurred when the program was trying to recruit the PHAs. These cuts had three effects on the adoption of the EEBUA. First, many PHA

officials had to devote their attention to lobbying against the cuts when they were first proposed and this left them less time to focus on the EEBUA. Second, when the funding cuts went through, PHAs had to devote time and attention to keeping Section 8 tenants in their apartments with less Federal money available. Third, the funding cuts also forced some PHAs to lay off staff, which made adoption and implementation of the EEBUA more difficult. "You do what you can with what you have due to staffing cuts and all of our attention being squeezed," said one PHA staffer. "Because of the Section 8 cuts, [the EEBUA] becomes one of those things that you look at secondarily."

Members of the DfC Program staff gave a similar account of the effect of the Section 8 funding cuts on PHA recruitment. "There was about an eight-month period when we were trying to contact the new housing authorities and they all said the same thing: "Our funding has been slashed down due to Section 8 reduction, " said one DfC Program staff person. "All their competing issues were very real and they made our EEBUA look like a luxury item when they were just trying to keep people in homes," another DfC staffer acknowledged. "It was the center of our universe but not theirs."

4.1.3.2 Participating PHA Dissatisfaction with EEBUA Adoption Process

Although the PHA participants were generally very satisfied with the DfC Program's efforts to get the EEBUA adopted, a few were dissatisfied with some aspects of the adoption process. These complaints included:

- *Recruitment effort was excessive* – One PHA representative thought that the program's orchestration of affordable housing owners/developers and other sector stakeholders to lobby the PHA for adoption of the EEBUA was excessive. "There were way too many people contacting us and we don't need that," he said. "To be honest, it was a nuisance."
- *Program took long to re-calculate EEBUA.* – When one of the California utilities reduced its rates, a PHA representative said that the DfC Program staff took much longer than expected to recalculate the EEBUA based on the new rates. "I would think that given what they do that would have been a no-brainer," he said. "But it was really complicated for them to figure it out."
- *Initial explanation of EEBUA benefits unclear* – A representative of one of the adopting PHAs said that the DfC Program's initial explanation of why his PHA should adopt the EEBUA was unclear. "At first, we really just didn't get why we would want to do this," he said, "but eventually we got to the bottom of things."

4.1.3.3 Why Some PHAs Chose Not To Adopt

In addition to delays in adopting the EEBUA, a number of PHAs that were approached by the DfC Program simply chose not to adopt the EEBUA. KEMA completed interviews with six of these "non-participating" PHAs. KEMA asked the PHAs why they had not adopted the EEBUA. They gave eleven different reasons with only three of these being cited by more than one respondent. The reasons included:

- *The cost savings from the EEBUA was not large enough.* Three of the PHAs cited this as a contributing factor for why they had not adopted the EEBUA. One said that the small difference between their standard utility allowance and the EEBUA "made it easier to the put the EEBUA on the back burner." Another said that the mild weather in their area meant that energy bills were relatively small to begin with and this made the EEBUA savings even smaller in absolute dollar terms. He also said that his PHA already subsidized the utility allowance to a great extent. A third PHA said that small pay outs from the EEBUA were one reason why developers in its jurisdiction were not very enthusiastic about adopting the EEBUA.

- *The DfC Program did not adequately show how PHAs would benefit from the EEBUA.* Two PHAs cited this is as a reason why they did not adopt the EEBUA. They both claimed that the DfC Program presentation put too much emphasis on how the program would benefit the developers and did not make the case for benefits to the PHA and its tenants. "I don't care how it is going to benefit some private developer," one PHA official remarked. Another said that it would have been very persuasive if the DfC Program had presented a case study of another PHA, similar in size and character to their own, that had adopted the EEBUA and had a positive experience.
- *The PHAs had been too busy to pay enough attention to the DfC Program* – Two PHAs cited this as the reason why they did not adopt the EEBUA. They pointed to dealing with cuts in Section 8 funding as one major distraction that made it easier to put the EEBUA on the "back burner." One PHA official had also been involved in a major property acquisition and these negotiations kept the PHA from paying attention to the DfC Program proposal.

Other reasons cited by a single PHA for not adopting the EEBUA included:

- *Concerns about the administrative burden of the EEBUA* – One PHA official said that although he realized that the DfC Program was offering assistance in administering the EEBUA, he feared that "this might go away and we would be left holding the bag." "We were concerned that when the dust settled we would be responsible for the bulk of the work," he added.
- *Concerns about maintaining two utility allowances* – One PHA official felt uncomfortable carrying different Utility Allowances at the same time. "We thought it would bring an unnecessary level of complexity to the process," he said. He was also concerned that the EEBUA would cause difficulties with the software they use to calculate the utility allowances.
- *Inability to get buy-in from the developers* – One official said that "the inability to get buy-in from the developers" about the EEBUA made it difficult to go forward with the concept. The feedback of the developers was that "the concept required more analysis" and that they were not sure that the energy savings from energy-efficiency improvements would give them the necessary return on investment. A meeting that was held for developers to explain the EEBUA was not well attended. He thought that the DfC Program should have done more "handholding" to make sure that the developers understood the benefits of the DfC Program.
- *Poor communications* – One PHA official said "it took too long to get the gist of what [the DfC Program] wanted" from the PHA. He said that it required multiple emails and meetings to understand what the EEBUA was all about and what the PHA had to do. These delays hindered its adoption.
- *Complaints about the DfC Program exerting excessive pressure for adoption* – One PHA official said that the DfC Program came on too strong to get him to adopt the EEBUA and even tried to exert pressure by publicizing his delays in adopting the EEBUA to city officials.
- *Skepticism about energy savings* – One PHA official who claimed to already build and maintain energy-efficient housing was skeptical that the DfC Program would deliver the promised energy savings. He felt that the DfC Program did not provide a clear explanation of the baseline assumptions and how the energy savings could be achieved. He also noted that it was difficult to get access to tenant utility bills to try to verify energy savings.

- *Bad timing* – One PHA official said that his PHA had just adopted a new standard utility allowance when the DfC Program approached them. This added to the PHA's confusion and made the PHA less willing to create a second utility allowance so soon afterwards.
- *Dispute between a PHA and their city* – One PHA said that they had wanted to adopt the EEBUA but they had a poor relationship with their city and only the city could adopt the EEBUA.

Interviews with the DfC Program staff indicated that they were aware of some of these reasons for non-adoption. For example, the staff acknowledged that some PHAs did not adopt because they found the program's main carrot – the prospect of affordable housing owners/developers in their jurisdiction receiving financial incentives as well as the EEBUA – as unappealing. "I think we overestimated how interested the housing authorities would be in rewarding their owners with money," said one program staffer. "A lot of them could care less about it." The program staff also conceded that in some cases their over-aggressive recruitment efforts may have backfired on them. "We got our heads bit off a couple of times by housing authorities because we were being so aggressive and assertive," a program staffer said. Finally, program staff were also well aware of the negative effects of cuts in Section 8 funding on their recruitment efforts (as discussed above).

4.1.3.4 Problems with Implementing the EEBUA

Although HMG reported that nine PHAs adopted or approved the EEBUA, we were unable to locate any housing projects within their jurisdictions that had started using the EEBUAs during the 2004-2005 program years. DfC Program staff said that three projects in Yolo County and one project in Monterey County had adopted the EEBUA. However, we found that two of these projects had not yet been constructed. Therefore, while the EEBUAs might have played a role in helping to finance these projects, they had not yet been used with any tenants. We were also unable to confirm the existence of the other EEBUA projects claimed by the program. A number of the PHA representatives stated that while it was possible that some of the affordable housing property owners/developers in their jurisdiction might have adopted the EEBUA, this was not something that they would necessarily know about and they had not inquired about it.

The representatives of the seven participating PHAs cited a number of reasons why the EEBUAs had not been implemented in their jurisdictions including:

- *Not enough time to implement* – As mentioned, the two PHAs that had waited for HUD approval – the San Francisco and San Joaquin Public Housing Authorities – only received the HUD waiver for the EEBUA in January 2006. Other PHAs that had also adopted the EEBUA relatively late in the program cycle said that there had been not enough time to market the EEBUA to their affordable housing owners/developers. In other cases, no new affordable housing projects have been proposed during the short window of time since the EEBUA has been adopted.
- *Lack of a relevant case study* – One PHA representative said that the inability of the DfC Program to produce an EEBUA case study that was in the same climate zone as their jurisdiction made it difficult to convince affordable housing owners/developers to adopt the EEBUA.
- *Unavailability of an updated EEBUA* – One PHA representative said that the DfC Program did not provide him with an updated EEBUA that he could use in 2006. "They provided us with an [EEBUA] for 2005," he said "but when I went back to them to say: 'Okay, what are we doing for

2006?' I was basically told that they could no longer help us." As a result, the PHA representative said "at this point in time we don't have an [EEBUA] for 2006."

- *PHAs not proactive* – While some of the PHA representatives said they were proactive in advertising the availability of the EEBUA to their owners/developers, others did little marketing and had not bothered to find out whether any owners/developers had adopted the EEBUA.

DfC Program staff pointed to a couple of other reasons why the EEBUAs had not been implemented:

- *Some PHAs opted not to have EEBUA workshops* – The DfC Program staff noted that some PHAs opted not to have the program conduct an EEBUA training seminar with the affordable housing owners/developers in their area.
- *One PHA forgot that it had adopted the EEBUA* – The DfC Program staff reported that one PHA that had adopted the EEBUA forgot that it had done so. It therefore initially turned away a developer that was interested in using the EEBUA.

4.1.3.5 Suggestions for Program Improvements

Non-participating PHAs. KEMA asked the non-participating PHA officials whether the EEBUA would have had a better chance of adoption if it had been presented in a different manner. Four of the six said no. They generally thought that the DfC Program had done a good job of explaining the EEBUA. A couple of these PHAs did admit that they did not grasp the concept on the first take and follow-up information and explanation was needed. However, all four said that the EEBUA had not been adopted for other reasons besides how it was presented to them.

Two of the PHA officials said that the DfC Program's presentation of the EEBUA was influential in them *not adopting* it. As discussed in the previous section, both of them were turned off by too much emphasis on how the EEBUA would benefit developers and not enough on how it would benefit the PHA and its tenants. One PHA official wished that the DfC Program had provided a case study of another PHA, similar in size and character to his own, that had adopted the EEBUA and had a positive experience. He wished that this case study would contain information such as the level of PHA staff involvement, the extent of developer involvement, the nature of the construction or retrofit projects, and most importantly how the PHA and the tenants benefited.

Both of these PHA officials also wished that the DfC Program had informational materials that provided a more concise explanation of both how the EEBUA worked and how energy savings would be achieved. One official said that more visuals and more simplified terminology would have helped. He thought that much of the DfC Program information was too long and dense. "If you want me to understand that you're talking about *Moby Dick*, show me a white whale," he said. "Don't make me read *Moby Dick*."

KEMA also asked the PHA officials whether the EEBUA would have had a better chance of adoption if it had been designed in a different manner. Four of the PHAs said that design changes would have improved the chance of adoption. Two of the PHAs reiterated that the DfC Program placed too much emphasis on helping developers instead of helping PHAs and their tenants. The one PHA that was unable to adopt the EEBUA because of poor relations with its city hoped that the program could be changed so that city approval was not necessary. One PHA wondered whether the small differences in energy costs between the EEBUA and the standard utility allowance could be increased through some sort of program redesign.

Participating PHAs. The PHAs who eventually joined the program had their own suggestions as to what the DfC Program could have done differently to encourage EEBUA adoption and implementation. These included:

- *More post-adoption technical assistance* – "One thing that I might like to see," said one PHA representative, "would be a more full technical assistance program from start to finish." He noted that DfC Program's funds for technical assistance ran out before his PHA had fully implemented the EEBUA. As noted, another PHA representative wished that program technical assistance could have been available to calculate a new EEBUA for 2006.
- *Information tailored more for PHAs than owners/developers* – "The information that we received was really tailored more towards developers," one PHA representative said. "It could have been helpful to have something like that tailored more towards [us]," she noted.
- *More case studies* – As noted, one PHA representative thought that the program should provide a wider diversity of relevant case studies of PHAs that successfully adopted the EEBUA.
- *Less aggressive lobbying for adoption* – "I don't think it requires the amount of funding and energy going into it to get people to pass [the EEBUA]," said one PHA representative. "I think all it takes is a decent package put together by a relevant utility company and saying what it takes to pass [the EEBUA] and what it does in terms of savings for us and a future developer," he said. "With that, I think we could have gone ahead just as quickly to decide that we wanted to do it."

DfC Program Staff. The DfC Program staff also had their own suggestions for improving the EEBUA adoption and implementation process based on the lessons they learned through implementing the program in the 2004-2005 program year. They plan to incorporate these strategies in the 2006 version of the program. The suggested improvements include:

- *Do more marketing of the EEBUA in PHA meetings* – One DfC Program staff person thought it would have been beneficial to do more presentations and workshops with the PHA trade associations than they had done. The staffer thought that this would be beneficial not only from a resource efficiency standpoint but also because if one of the PHAs in the group showed interest in the EEBUA concept, others might be carried along by their enthusiasm, or at least might become less skeptical.
- *Make greater use of industry leaders* – "Industry leader endorsement could probably have helped a bit," one of the DfC Program staff persons said. During 2004-2005, the program did try to recruit organizations like the Non-Profit Housing Association of Northern California and the Southern California Association of Non-Profit Housing. NPH did publicly endorse EEBUA, published articles in its newsletter, and provided endorsement quotes for other articles.
- *Provide more customized sales pitches* – KEMA interviews with both participating and non-participating PHAs revealed that sometimes the DfC Program used sales pitches for EEBUA adoption that were not appropriately tailored to the PHA being targeted. Although the DfC Program staff did some background research on the PHAs before approaching them, they conceded that they could have done much more. One DfC Program staff person explained:

  > *"The thing is, you've got to get to know the PHA and the person who's making that decision because you've got to figure out what button to push. Do they care about the environment and energy efficiency and*

being green? Do they care that the tenants have a comfortable home? Do they care about the financing? So you kind of have to have a conversation to figure out what message is going to provoke them basically … I'm sure if we had more time to converse with them and find out what makes them tick we probably could have tailored it a little better."

- *Making greater use of developers as lobbyists* – Although the DfC Program did make some use of owners/developers of affordable multifamily to lobby for EEBUA adoption, in retrospect the DfC Program staff thought that they probably could have made greater use of this resource. "For some PHAs it's completely developer-driven," one DfC Program staffer said. "Nothing comes alive until a developer says: 'Hey, I need this.'' However, it is important to point out that not all PHAs are responsive to developer lobbying and some are even turned off by it (as discussed above).

4.2 Energy Efficiency Projects at Affordable Multifamily Housing Properties

This section presents evaluation findings related to the component of the program in which owners/developers of affordable multifamily housing projects were eligible for financial incentives for making energy efficiency improvements at existing properties. HERS raters and other energy consultants also receive financial incentives from the program to perform the measure specification, energy savings estimation, and installation verification tasks required by the program.

As mentioned above, this component of the DfC Program was originally designed to support PHA adoption of the EEBUA. However, as the EEBUA adoption process dragged on and the energy savings goals were not being achieved, the program was modified to allow qualifying affordable housing owners/developers to receive the incentives regardless of EEBUA adoption.

The following subsections discuss the barriers that owners/developers of affordable multifamily housing faced in implementing energy-efficient improvements and the program strategies designed to mitigate these barriers.

4.2.1 Barriers to Energy Efficiency Project Implementation in Affordable Multifamily Housing

The owners/developers of multifamily affordable housing face a number of barriers to incorporating energy-efficient measures in their new construction and retrofit projects. These barriers include:

- *Almost no economic incentives to build energy efficient multifamily housing or upgrade the efficiency of existing housing* – As long as the housing complex is using a standard utility allowance, there is little economic incentive for these owner/developers to invest in energy efficiency.
- *Lack of capital for upgrades* – The proposal for the 2004-2005 DfC Program noted that funding for affordable housing projects may come from as many a dozen different projects. "Though there is a strong desire to do the "right" thing, [owner/developers] are constrained by their financing requirements on how their revenues and reserve funds can be spent," the proposal said. "This

hinders the usefulness of [EEBUAs] because they do not have the up-front cash to implement the upgrades."

- *Lack of familiarity with energy efficiency technical assistance* – The program discovered that many owners/developers of affordable housing projects were unfamiliar with the HERS raters and other energy consultants that can provide advice on what energy efficiency measures to install and can estimate resulting energy savings.
- *Time and attention barriers* – "It is hard to get even five minutes of a developer's time," one DfC Program staffer noted.
- *Bad experiences with other energy efficiency programs* – "Developers are very afraid of getting committed to something that takes a whole lot of effort," one DfC Program staff person noted. "Many of the developers have participated in utility rebate programs in the past and have been seriously burned." A common concern is that the staff time spent filling out the paperwork will exceed the value of the financial incentives.

4.2.2 Mitigating Barriers to Energy Efficiency Project Implementation

HMG designed the 2004-2005 DfC Program with strategies for mitigating these barriers. Table 4-4 summarizes these barriers as well as the DfC Program's strategies for overcoming these barriers.

As noted, in early 2005 the program decided to allow qualifying affordable housing owners/developers to receive the incentives even if their jurisdictional PHA had not adopted the EEBUA. Therefore the owners/ developers that implemented energy efficiency projects through the 2004-2005 program were not planning to use the EEBUA and sometimes had not even heard of the concept.

4.2.3 Program Successes

4.2.3.1 Energy Savings Achieved

Overall, the DfC Program was able to achieve the majority of its energy savings goals for the affordable multifamily housing sector[1]. The multi-family component of the program had goals of reaching 1,150 apartment units and achieving impacts of 431 megawatt hours per year (kWh), 0.64 megawatts (MW), and 88,320 therms per year.

[1] The impact evaluation has verified the majority of these reported achievements, as discussed in Section 5.

Table 4-4
Barriers and Program Strategies for Affordable Housing Owners/ Developers

Barriers to Implementation	Program Strategy
1. Developers of affordable housing do not have the economic incentive to build more energy efficient units when only conventional Utility Allowances are in effect in their PHAs.	• Getting EEBUAs adopted so that developers will have the incentive to build energy efficient units
2. Owners of affordable housing do not have the economic incentive to upgrade existing units for better energy efficiency when only conventional Utility Allowances are in effect in their PHAs.	• Getting EEBUAs adopted to give owners incentives to upgrade units for better energy efficiency
3. Owners/developers of affordable housing lack capital and technical expertise for energy efficiency upgrades.	• Providing financial incentives and design assistance for owner developers as well as incentives for the use of energy consultants and HERS raters
4. Owners/developers of affordable housing are too busy to get involved with the program or even to become familiar with EEBUA concept.	• Explaining to owner/developers the availability of financial incentives and design assistance as well as the economic benefits of the EEBUA. • Providing the owner/developers with a lot of "handholding" to guide them through the program requirements and procedures.
5. Owners/developers of affordable housing have had bad experiences with paperwork burden from past energy efficiency programs and think DfC Program will require a lot of their time.	• Explaining to owners/developers how DfC Program is different than other energy efficiency programs they have dealt with in the past

The program implemented a total of 20 projects affecting just over 1,000 apartment units. HMG claimed annual energy savings for these projects of 969 MWh, 1.48 MW and 59,476 therms. This equates to over 200% of the electricity and demand savings goals, but only two-thirds of its natural gas energy savings goal.

Table 4-5 shows these program energy savings goals and reported achievements by utility service territories. As shown, HMG well exceeded its goals for PG&E and SCG, and all but the natural gas energy savings goal for SDG&E. HMG fell short of its goals for SCE. See Section 5 for the evaluation results related to these reported achievements.

In addition to these projects implemented during the 2004-2005 program cycle, the program also has a waiting list of other projects that are seeking to use program incentives. The program hopes to accommodate many of these in the 2006 program year.

Table 4-5
Energy Savings Goals and Reported Achievements by Utility Service Territory

IOU	Metric	Goals [1]	Reported Achievements [2]	Percent of Goals Achieved
PG&E	Units	495	559	113%
	Annual MWh	186	748	403%
	MW	0.28	1.08	384%
	Annual Therms	38,016	32,272	85%
SCE	Units	380	107	28%
	Annual MWh	143	95	67%
	MW	0.22	0.21	95%
	Annual Therms	29,184	6,857	23%
SCG	Units	115	144	125%
	Annual MWh	43	63	146%
	MW	0.07	0.19	276%
	Annual Therms	8,832	10,481	119%
SDG&E	Units	161	194	120%
	Annual MWh	60	63	104%
	MW	0.09	0.10	107%
	Annual Therms	12,365	9,866	80%
Total Program	**Units**	**1,150**	**1,004**	**87%**
	Annual MWh	**431**	**969**	**225%**
	MW	**0.64**	**1.57**	**245%**
	Annual Therms	**88,320**	**59,476**	**67%**

[1] HMG 2004-2005 DfC Program proposal.

[2] Final project documentation provided by HMG.

4.2.3.2 Recruitment of Owners/Developers

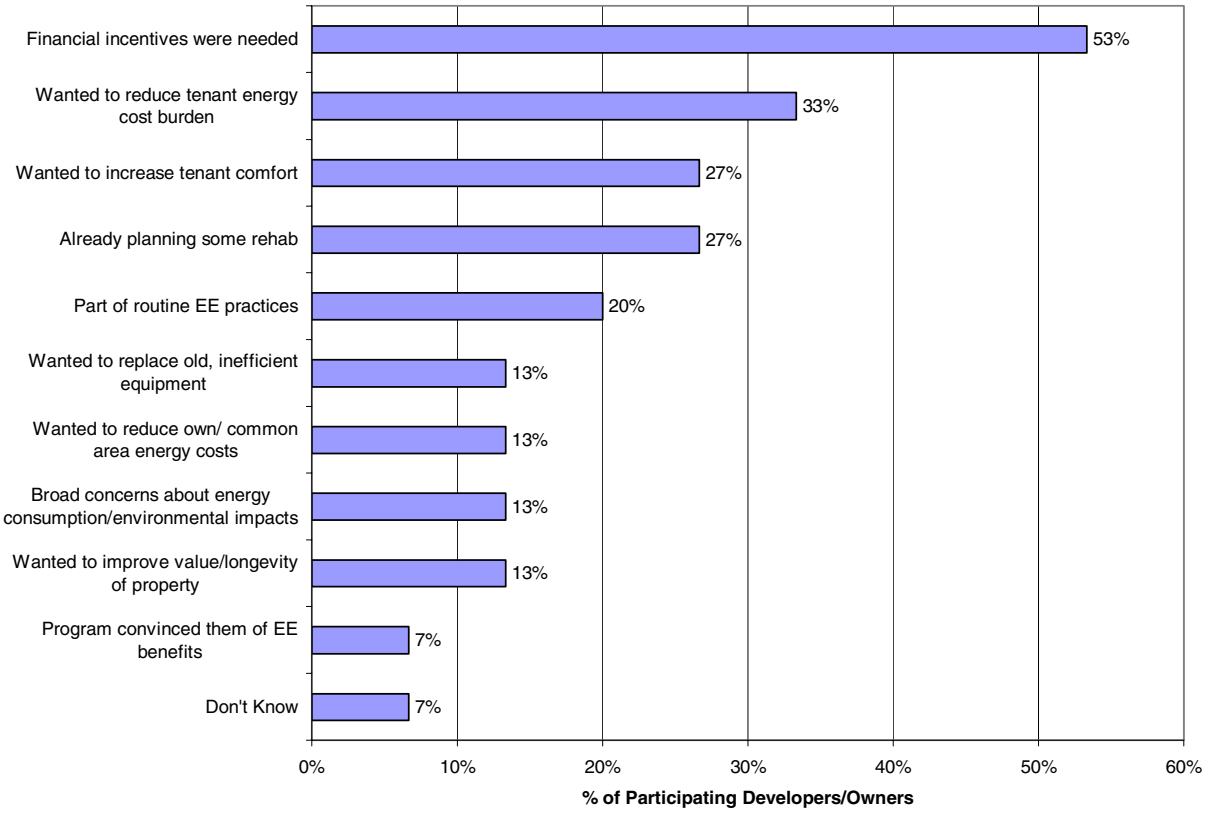
KEMA conducted interviews with 18 representatives of 15 companies that own, develop, and/or manage affordable multifamily properties and were involved in energy efficiency projects rebated by the DfC Program. KEMA asked them how they heard about the DfC Program and what motivated them to join. Table 4-6 shows that nearly half of the participating owner/developer representatives heard of the program either by encountering a DfC Program staff person at a conference/workshop or through their own Internet searches for rebate opportunities. Three other owner/developer representatives heard about the program through other DfC staff outreach activities. The remaining owner/developer representatives heard about the program through non-DfC staff sources or did not know or recall the original source of program awareness.

Table 4-6
How Participating Owners/Developers Heard About the Program

Source of Program Information	Percent of Owners/ Developers
Met/heard DfC Program staff at conference or workshop	20%
Found program through Internet searches for rebates opportunities	20%
Received phone call from DfC Program staff	7%
Heard about program from unrecalled DfC Program outreach	7%
Were aware of HMG from pre-2004 project	7%
Heard about program from HERS rater	7%
Heard about program from installation contractor	7%
Heard about program from local utility	7%
Did not know/recall source of program awareness	20%
Total (n = 15)	**100%**

KEMA also asked these owner/developer representatives what motivated them to participate in the program. This was of particular interest because, as noted, they did not have plans to take advantage of the EEBUA. Figure 4-2 shows that over half of the respondents cited the need for financial incentives as a reason for joining the program. This makes sense in light of the program theory which identifies lack of capital as a major barrier to the implementation of energy efficient measures.

Figure 4-2
Why Participating Owners/Developers Joined the Program



Note: N = 15, total exceeds 100% due to respondents citing multiple motivations.

However, the chart also shows that the owner/developer representatives had many other motivations for joining the program. At least four of the respondents cited a desire to reduce tenant energy cost burdens and to increase tenant comfort. It is important to note that many of the owners/developers are non-profit organizations that have broader humanitarian missions than just housing. Therefore it is not surprising that these would be more concerned about tenant cost burdens and comfort levels than the average landlord. In addition, some of the participating buildings are largely made up of tenants from segments of the population – such as the mentally disabled, the elderly, and single mothers – which might be particularly sensitive to comfort issues. "We're an old building and hot water takes a long time to get to the lower floors," one owner/developer representative said. "And when you're disabled and you have to take a lukewarm shower it's not real fun."

4.2.3.3 Participating Owners/Developers' Satisfaction with the Program

KEMA also asked participating owner/developer representatives to rate their satisfaction with various aspects of the DfC Program as well as with the program as a whole. The interviewees were asked to rate their level of satisfaction using a scale where 1 meant "not at all satisfied" and 5 meant "completely satisfied." They were also asked to explain their satisfaction ratings.

In addition to these quantitative assessments of satisfaction, KEMA also asked about the owner/developer representatives' experience with other program processes. These included:

- Whether they had difficulty determining which energy efficient equipment qualified for the rebates;
- Whether they had difficulty obtaining the specified energy efficient equipment or a contractor to install it;
- Whether the energy efficient equipment was properly installed and performing as expected;
- Whether their rebate payments had been received in a timely manner; and
- Whether the level of rebate payments met their expectations.

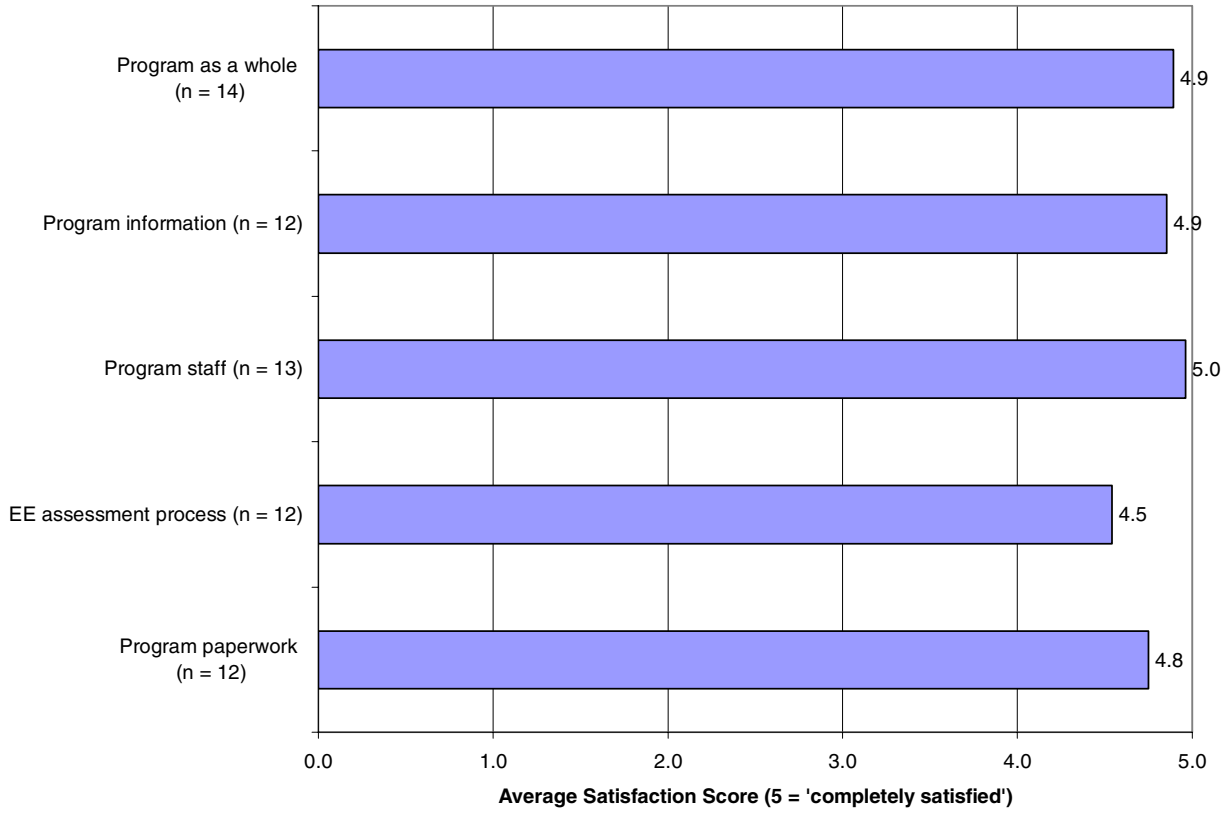
Figure 4- shows that that the participating owner/developer representatives were generally very satisfied with all aspects of the program. They gave the program higher satisfaction ratings than the PHAs did.

In explaining these satisfaction ratings, the owner/developer representatives paid particularly high compliments to the DfC Program staff. "Very knowledgeable, very on top of things," said one representative. "They've been totally wonderful and real fun to work with," said another. "They were terrific," said a third.

In addition to providing ongoing support for the implementation of energy efficiency projects, in a few cases the DfC Program staff also conducted workshops with tenants who lived in buildings that were being retrofitted. These workshops involved the distribution of the EnergyWise packs to the tenants as well as general energy efficiency education. One of the owner/developer representatives had high praise for a DfC Program presentation that was given to a group of disadvantaged young people who lived in his buildings:

> *"[The DfC Program staff person] gave this really cool presentation – her and [the HERS rater]. By then the windows were in so they talked about the windows. [The DfC Program staff person] was really good. I don't know if you've ever worked with teenagers or city kids. You can talk over their heads real easy or you can talk down to them real easy. She was perfect. And even [the HERS rater] was talking about UV rays and U ratings and all that. The kids were just silent, which you never hear, they were really caught up in it. [The DfC Program staff person] was showing them the showerheads and telling them that the property managers would be installing them and talking to them about energy efficiency and how it related to their utility bills – which is a big deal for them – which is real practical stuff. [The HERS rater] was real good talking about how these windows work, how it reflects heat, etc. They were great."*

Figure 4-3
Owner/Developer Satisfaction with the DfC Program



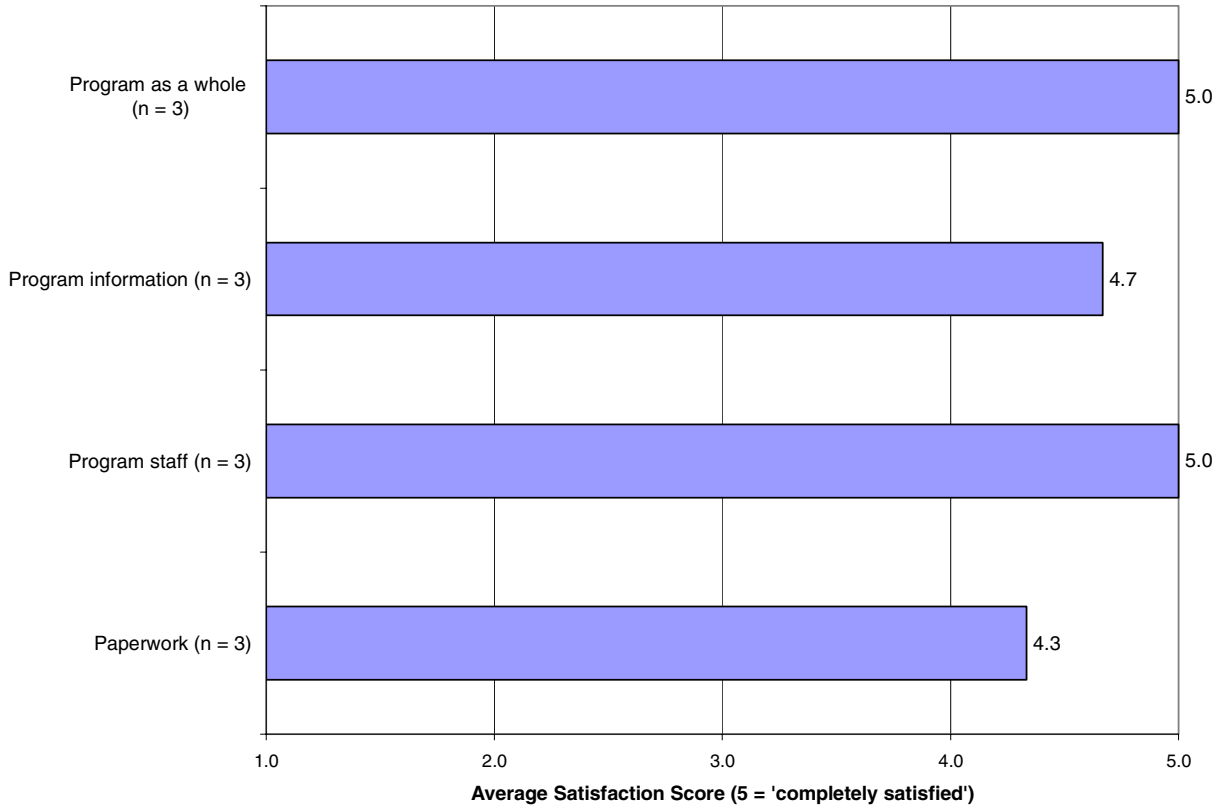
The owner/developer representatives also had few difficulties with the other project logistics such as the determining which energy efficient equipment qualified for the rebates, obtaining the specified equipment and finding contractors to install it. They were generally happy with the level of financial incentive payments they received. There were a few problems with the installed equipment and concerns about the timeliness of the financial incentive payments. These are discussed in the next section.

4.2.3.4 HERS Rater and Energy Consultant Satisfaction with the Program

KEMA interviewed three of the five HERS raters and energy consultants who worked with the DfC Program. These three HERS raters and energy consultants worked on the large majority of projects that received financial incentives through the program. A DfC Program staff person said that the program purposely limited the number of HERS raters and energy consultants for efficiency reasons. “It was helpful for us to just focus on these five HERS raters and energy consultants because they were beginning to understand the program and how it works and all the paperwork involved in it,” she said. “So that helped us recruit the projects immediately and assign to them an energy consultant who was already familiar with our program.” The program staff person also noted that the HERS rater and energy consultant was often the same person. “This helped us because it called for less coordination on our part,” she said.

KEMA asked these three HERS raters and energy consultants about their satisfaction with various aspects of the program. Figure 4- shows that they were very satisfied with the program staff and the program as a whole and were mostly satisfied with the program information and paperwork. The lower paperwork score was primarily due to one of the respondents giving it a "3" due to a general dislike of paperwork.

Figure 4-4
HERS Rater and Energy Consultant Satisfaction with the DfC Program



KEMA also asked them whether they encountered any problems while performing their project qualification, measure specification, energy savings estimation, or inspection duties. Each of them reported at least one difficult project and all of them conceded that procrastination by owners/developers to get measures installed led to a very busy analysis and inspection period at the end of 2005. However, in general, they thought the process went fairly smoothly considering the time constraints and the complexity of some of the projects.

4.2.3.5 Promoting the Use of HERS Raters and Energy Consultants

Another area of program success was the fostering of relationships between the owners/developers and the HERS raters and energy consultants which is providing mutual benefits. With one exception, discussed in the section, the owner/developer representatives were very pleased with the quality of the work performed by the HERS raters and energy consultants. Many of them had not worked with such HERS raters or energy consultants before and the experience opened their eyes to the advantages offered by such experts. "For the most part the developers are just so busy running the day-to-day stuff that they

really don't have time for [energy efficiency projects]," one energy consultant explained. "So they appreciate the fact that it's laid out for them and set up for them so that they don't have to research it themselves." One of the owner/developers echoed this assessment. "I received enough assistance from [the DfC Program] throughout the process," he said, "that I was able to get this project facilitated without taking too much away from my normal workload."

The program has also opened up new business opportunities for the HERS raters and energy consultants. All of them said that the working with the program had expanded their work horizons and business opportunities. "It's a new area for energy consultants to look at existing buildings, which they typically don't do," one of the consultants said. "And it's also a good job for a HERS rater because they're exposed to different types of installations – retrofit as opposed to new construction." Another consultant said that she especially like the program because it allowed her to see the outcomes of her recommendations. "It's satisfying to see things actually get implemented," she said. "We're mostly just seeing plans up front and we never see what actually happens at the end."

Word of the opportunities offered by the DfC Program have even spread within the California energy consulting community. One of the DfC Program staff members recently attended a California Association of Building Energy Consultants (CABEC) conference and received a dozen business cards from HERS raters and other energy consultants. "People were saying: 'I want to do this'", she recalled.

4.2.4 Areas of Concern

4.2.4.1 Owner/Developer Dissatisfaction with the Energy Efficiency Project Process

Although the owners/PHA participants were generally very satisfied with the process for getting the energy efficiency projects implemented, there were a few problems and complaints:

- *Delays in financial incentive payments* – KEMA interviewed most of the owner/developer representatives in March 2006, nearly three months after the close of the 2004-2005 DfC Program. Yet at the time of these interviews, only six of the 15 representatives had received their financial incentive payments. Most of the representatives that had not received their payments were unconcerned about this, either because the DfC Program staff had already warned them of payments delays or because they considered such delays as normal for such programs. However, a couple of the representatives were unhappy with the slow payments. According to DfC Program staff, these delays are the result of payments to third-party implementers being held until projects are completed. Once a project is completed and invoiced, according to DfC Program staff, the turn-around time from the utilities is generally 90 days.
- *Dissatisfaction with the performance of a HERS rater* – Figure 4- shows that the lowest average satisfaction score given by the owner/developer representatives was for the energy efficiency assessment process, which encompassed the activities of the HERS rater or energy consultant. This was due to one owner being very unhappy with the performance of the HERS rater he used for the project. He claimed that the HERS rater only inspected one of the units in his building and then charged him as if she had inspected all the units in his building. He also thought that her pre- and post-inspections were much less thorough than audits he had experienced from other energy efficiency programs.
- *Problems finding qualifying equipment* – When one of the owner/developer representatives went to arrange for the purchase of the energy efficient equipment that had been recommended by the DfC Program's HERS rater, she found out that the supplier of the equipment knew nothing about

the program and its requirements. Therefore she had to arrange for her mechanical engineer to talk to the equipment supplier to make sure that the equipment supplied would qualify for the DfC Program.

- *Problems with installed equipment* – In a couple of instances, there were problems with the installation of the energy efficient equipment. A fire broke out in the attics of one of the multifamily buildings where insulation was being installed. Fortunately, the insulation that was being installed was fire retardant so the damage was somewhat minimal. Another owner/developer reported that the recirculating pump that they had installed turned out to be a modification of an existing pump and the new design had not received United Laboratories (UL) certification. This caused problems with their building inspector.

4.2.4.2 Delays in project implementation

One problematic aspect of the DfC Program was the fact that most of the projects were implemented in the last six months of the 2004-2005 program cycle. This was due to a number of factors. As discussed above, the program initially planned to offer financial incentives only to owners/developers of affordable multifamily housing located in the jurisdictions of PHAs that had adopted the EEBUA. The program was modified to allow financial incentives for qualifying projects regardless of EEBUA adoption. However, by this time, the window of time for project recruitment and implementation was fairly narrow. In addition, DfC Program staff indicated that there were delays associated with getting this request approved via a the change order process.

The late implementation of the energy efficiency projects was also due to delays by the qualifying affordable housing owners/developers. Some of these delays were due to the complications of arranging financing for the projects. "They have to gather the funds," observed one DfC Program staff person, "and it takes awhile to actually get that going."

Other delays were due to basic procrastination on the part of the owners/developers. One of the HERS raters described the situation in December 2005:

> *"That month of December was pretty crazy for me. Unfortunately human nature being what it is, all these projects and people were busy people and they think they have time or they haven't left quite enough time and everything just piled up in the end there. I was always racing to the finish line to make sure that all the time that they put into the project wasn't going to get lost by missing the deadline. So that, unfortunately, was totally out of my control. I did everything I could to help facilitate the progress of the projects but some of the projects did have some challenging things to overcome."*

Interviews with the DfC Program staff indicated that they regretted that project implementation took so long. In retrospect they realized that the decision to allow financial incentives to be paid in non-EEBUA jurisdictions probably should have been made sooner. When asked what they would have done differently, one program staff person said "I would have recruited the projects from Day 1 – the day that the program started, or at least a few months later when we had all the marketing materials ready."

4.2.4.3 Underutilization of tenant training

Although owners/developers who did take advantage of the DfC Program's tenant-education service were very pleased with the results, only six of them did so – about a third of the total participants. "Some of

them opted out of having tenant workshops," said one DfC Program staff person, "and I think that was sort of a mistake." Another DfC Program staffer pointed to language barriers as a reason for this. "In Southern California especially, where most of their tenants were predominantly Chinese-speaking or Spanish-speaking," she noted, "the owners said: 'We don't want to deal with the trouble of getting an interpreter. Just give us the [EnergyWise packs] and we'll tell them all that is what they need to do.'"

4.3 Single-Family Sector Activities

This section contains the process evaluation findings for the single-family housing component of the DfC Program. Although most of the DfC Program activities focused on the affordable multifamily housing sector, one component of the program did try to improve energy efficiency in the affordable single-family housing sector. According to the DfC Program staff, this component was added in response to requests by voluntary organizations that work on rehabilitating this type of housing. The DfC Program paid financial incentives to these organizations to offset the equipment and labor costs of installing energy-efficient measures in these houses. The DfC Program also provide some energy efficiency education and training to these organizations.

4.3.1 Barriers to Energy Efficiency Project Implementation in Affordable Single-Family Housing

A number of significant barriers must be overcome to introduce more energy efficiency into the affordable single-family housing. These barriers include:

- Volunteer rehab organizations lack expertise in the identification of energy efficiency opportunities.
- Low-income single-family homeowners cannot afford more energy efficient equipment.
- *Volunteer rehab organizations often have limited periods of activity*. Many of the volunteer rehab organizations do most of their work in the winter or springtime. Therefore they do not even finalize their list of projects until the late Fall. "There are some Rebuilding Together organizations that we have met with and they said 'We want the money but wait until November,'" noted one DfC Program staffer. This makes the timing and coordination of energy efficiency projects more difficult.

Strategies for mitigating these barriers are shown in Table 4-7.

Table 4-7
Barriers and Program Strategies for Encouraging Energy Efficiency in the Affordable Single-Family Housing Sector

Barriers to Implementation	Program Strategy
1. Volunteer rehab organizations lack expertise in the identification of energy efficiency opportunities	• Providing volunteer rehab organizations with energy efficiency inspection and upgrade training
2. The low-income homeowners who work with the volunteer rehab organizations cannot afford more energy efficient equipment	• Providing financial incentives for energy efficient equipment upgrades
3. Volunteer rehab organizations do most of their work in the winter and spring.	• Timing program marketing and incentive offers to coincide with these activity cycles.

4.3.2 Program Successes

4.3.3 Project Implementation – Northern California

The DfC Program had a goal of installing energy efficient measures in 28 affordable single-family houses in the PG&E service territory. The program was able to get energy efficient measures installed in 32 homes, working with a group of Rebuilding Together organizations in the northern California area. This was the only utility service territory where the program was able to meet its goals. "It was a pleasure working with all those Rebuilding Together people in northern California because they were very proactive and they wanted to be part of this program," said one DfC Program staff person.

In addition to these 2004-2005 implemented projects, the program also compiled a waiting list of other project proposals. The fate of these wait-listed projects is unclear. The 2006 version of the DfC Program will not have a single-family component, but a separate PG&E program is working to encourage energy efficiency in the affordable single-family housing sector. DfC Program staff indicated that they have been referring interested single-family housing rehab organizations to the PG&E program contacts.

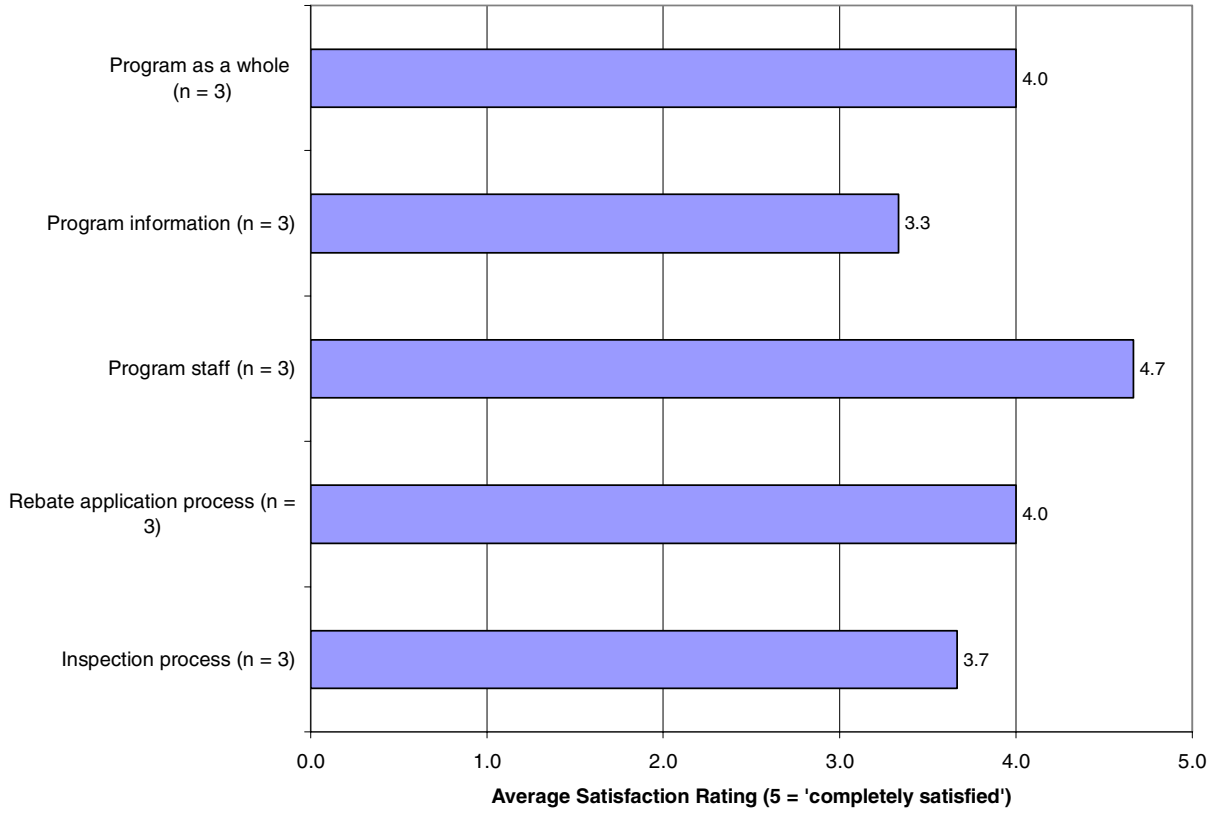
4.3.4 Participant Satisfaction – Northern California

KEMA interviewed representatives of three of these northern California Rebuilding Together organizations to find out their impressions of the DfC Program. These three organizations together accounted for about half of the single-family projects implemented in the PG&E service territory. KEMA asked these representatives about their satisfaction with various aspects of the program. Figure shows that they were very satisfied with performance of the HMG program staff and they were mostly satisfied with the rebate application process and the program as a whole. However, they did have some concerns with the program information and the inspection process. These concerns are discussed in the next section.

In addition to interviewing the voluntary housing rehab organization, KEMA also interviewed residents of 25 affordable single-family homes that were being retrofitted with the energy-efficient measures. These 25 homes accounted for 68 percent of single-family residences for which the DfC Program was claiming

savings. Most (21) of these residents were in PG&E's service territory. Although the main purpose of these interviews was to collect information needed for the impact analysis, the interviewers did ask the residents how satisfied they were with their energy-efficient improvements. The residents reported being happy with 26 of 31 (84 percent) of the measures installed through the program.

Figure 4-5
Voluntary Single-Family Housing Rehab Organization Satisfaction with the DfC Program



4.4 Areas of Concern

4.4.1 Low participation in Southern California

The DfC Program had a goal of installing energy efficient measures in 37 affordable single-family houses in southern California (21 for SCE, 9 for SCG, and 7 for SDG&E). The program was only able to have energy-efficient measures installed in five homes in southern California. Due to this lack of activity, and more demand for financial incentives in the multifamily sector, in late 2005 the program received approval to transfer incentive monies that had originally been allocated for these southern California single-family projects to large multifamily projects.

The DfC Program staff was somewhat perplexed by the fact that the housing rehab organizations in southern California were much less interested in the program than those in northern California. "[The

southern California housing rehab organizations] kept saying: 'It's too much work for us and until you're ready to pay us, we're not going to do it,'" observed one DfC Program staff person. "In northern California they never had that point of view."

The DfC Program staff had a number of theories to try to explain these regional differences:

- *Staffing levels* – One DfC Program staffer theorized that differences in staffing levels might explain the differences in attitude. "The Rebuilding Together organizations in Southern California didn't quite have the staff that the Northern California Rebuilding Together organizations had," the staffer observed. "So that could really influence how much time they could spend on not getting paid or it being just another task for them to do."
- *Heating needs* – Since many of the single-family rebates ended up going to upgrade heating equipment, another theory was that the more significant need for heating in northern California made upgrading equipment a more urgent concern.
- *Eligibility issues* – One DfC Program staffer noted that there were 2-3 non-profit organizations in southern California that were interested in the program, but they could not qualify because they dealt with mobile homes which were not eligible for the program.

4.4.2 Areas of Dissatisfaction

As Figure indicates, the three representatives of northern California Rebuilding Together organizations that KEMA interviewed were dissatisfied with some aspects of the program processes. These included:

- *Dissatisfaction with inspection protocols* – One representative said that a program staffer told her that because of the traveling distance involved, the program would only inspect the installed equipment when the organization had completed all their projects. "We weren't able to get the houses all done at the same time," the rehab organization representative said, "they were spread over a 6-month period." Delaying the inspections meant delaying the program rebate payments. "So we had to pay the contractors their share and then we didn't get paid until every house had been inspected," she said. "That was a major hardship for us."
- *Unclear eligibility rules* – One representative said that she promised a particularly needy resident in a mobile home that the DfC Program would upgrade her heating equipment only to find out afterwards that mobile homes do not qualify for the program. Eventually, the DfC Program allowed the project to go forward because of the promises made and because, according to the representative, "it was not clear in the instructions that mobile homes were excluded."
- *No compensation for administrative expenses* – Single-family housing rehab organizations in southern California indicated that they were unlikely to participate in the DfC Program in part because they wanted to be compensated for their administrative costs. A representative of one of the northern California rehab organizations voiced a similar complaint. "We weren't given any money to administer the program at all," she said. "Every cent we got was to spend on equipment." She argued that if the California Public Utilities Commission was willing to compensate the administrators and evaluators of the DfC Program for their time, it should be able to find some funds to cover the administrative costs of the voluntary rehab organizations.
- *No information on discount installation services* – One representative said that the DfC Program staff had claimed that they would "help us identify heating contractors who might participate in the program at a reduced rate or free of charge." However, when the representative contacted the

contractors on the list provided by the program, "none of them expressed any interest in working with the program." Therefore, they were forced to locate suitable contractors on their own.

- *Not allowing the rebate money to be spent on installation* – Initially, the DfC Program would only allow the rebates to be spent on equipment costs, not on installation costs. According to representatives of the voluntary rehab organizations, this rule discouraged a number of other similar organizations in other parts of California from participating. One of them explained why:

  > *"What we find in our line of work is that skilled volunteers are few and far between. You have unskilled people by the boatload who are willing to do many things. But if you really want somebody that's going to do something that's actually up to code and by the latest standards – and something like a heater – you don't want just anybody doing it. We had a very hard time finding anyone who would sign up to do it for free."*

  Eventually the DfC Program changed the rules and allowed some of the rebate money to be spent for equipment installation.

5. Impact Evaluation

The impact evaluation of HMG's DfC Program focused on three main components:

- Energy savings attributable to the multifamily component of the program,
- Energy savings attributable to the single-family voluntary rehab element of the program, and
- Energy savings attributable to the distribution of EnergyWise packs (low cost energy saving measures).

The following sections discuss results from the impact evaluations of all three of these program components.

5.1 Multifamily Projects

In the multifamily component of the DfC Program, incentives were provided for improvements in the efficiency of heating, cooling, and domestic hot water (DHW) systems. Projects were required to include an appropriate mix of measures to reduce energy use by at least 20% in these three systems. The program worked with HERS raters and Energy Consultants to identify appropriate measures, simulation programs were used to estimate the reduction in energy use, and pre- and post-inspections were required to ensure that all measures were installed to the correct specifications.

The majority of projects used EnergyPro to simulate the reduction in energy use brought about by the package of energy efficiency improvements proposed and eventually installed at participating sites. EnergyPro is a software tool for demonstrating code compliance using the CEC Alternative Calculation Method under the Title 24 Building Energy Efficiency Standards for new construction.[2] EnergyPro is most often used to estimate whole building energy consumption and compare that consumption to a theoretical building with similar features. Title 24 dictates features of the baseline (or standard) building upon factors such as size and type building and the prescriptive requirements of the standard.

For example, modeling a building with four stories or more Title 24 requires that the standard building use a built-up chilled water system. This system will have cooling tower pumps, heat rejection and chilled water and hot water pumping energy use. The actual design may use some type of packaged DX air conditioning or, in some cases, the actual design may not include space cooling at all. A standard cooling system is then assumed in the calculation method for that building.

For a retrofit program such as the DfC Program, this methodology can produce misleading results. For example, if a property installs insulation, the model will predict a reduction in the air conditioning load. This is appropriate if the property current has a cooling system installed (or plans to at some point in the future). However, for properties where no cooling systems are installed (or planned for installation), then the model predicts reductions in the cooling load and estimate air conditioning energy savings where none are achieved.

[2] California Energy Commission (CEC). *2001 Energy Efficiency Standards*. Report CEC P400-01-024. June 1, 2001. Sacramento, Calif.: California Energy Commission.

There are other compliance features that are fixed in the Alternative Calculation Method that may not reflect the actual building design and operation. For example, lighting power density (watts/square foot), occupancy density (number of building occupants/square foot), internal/process loads, and building occupancy schedules are all fixed in the simulation of both the standard building and the proposed building. If the fixed values in the model do not reflect the actual features of the building, then the resulting energy savings predicted from the software may be inaccurate.

We used an alternative approach to try to predict more reliably the actual energy savings that are likely to result from the energy efficiency measures installed through the program. Basically, EnergyPro was used but the simulations were run in "non-compliance mode." This means that normally fixed values (such as lighting, schedules, occupancy, etc.) can be changed, and a true simulation of the building – with and without the program measures – can be run to show more realistic savings estimates.

Based on our analysis, the biggest difference between the program's reported savings estimates and the estimates derived from the impact evaluation was evident in buildings were no cooling systems existed prior to the upgrade.

While the design of the DfC Program dictates the methodology used to calculate energy savings, the evaluation is not burdened by this requirement. In order to determine whether or not the program achieved its targets under the same set of assumptions used in its design, we first compare our verified energy savings estimates to HMG's goals and reported accomplishments using the non-compliance results of the simulation runs. This allows us to compare targeted, reported, and verified energy savings estimates on a more level playing field.

We also provide a second set of evaluation results that should provide a more realistic picture of the actual energy savings that resulted from the installation of measures through this program. This second set of results should be used by the CPUC to assess the effectiveness of the DfC Program relative to other, more prescriptive retrofit incentive programs targeting the multifamily sector.

5.1.1 Project Summaries

A total of 20 sites participated in the multifamily component of the 2004-2005 DfC Program. HMG provided the simulation programs for most of the sites and, where the program was not available, report and calculation materials from the Energy Consultant describing the savings calculations and simulation methods. HMG also provided a spreadsheet that converted the simulation results into final energy savings and calculated the percent energy savings resulting from the installation of the rebated measures. Table 5-1 summarizes each of these 20 projects.

As shown, there were eight multifamily projects implemented in PG&E's service territory and six in SDG&E's service territory. Three projects each were implemented in the service territories of SCG and SCE. The following summarizes the types of energy efficiency measures installed at these 20 sites:

- *Building shell.* Nearly all of the projects (18 of 20) involved some type of energy efficiency improvement affecting the building shell. Measures typically installed in this category include attic insulation, wall insulation, floor insulation and new windows.

Table 5-1
Summary of Multifamily Energy Efficiency Projects (2004-2005 DfC Program)

Project ID	City	IOU	Climate Zone	Number of Units	Square Footage	Measures Installed	Project Completed	Average Percent Improvement
04-107	San Francisco	PG&E	3	63	57,210	• Attic insulation • Windows • DHW controls	4/1/2005	28%
04-119	Fresno	PG&E	13	216	75,720	• DHW boiler replacement • HVAC tune-up • Booster pumps for boilers	12/1/2005	24%
04-125	Paso Robles	PG&E	4	40	26,049	• Heat pumps • Attic insulation • Radiant barrier • DHW controls	7/1/2005	28%
04-204	West Sacramento	PG&E	12	8	3,548	• Windows • HVAC replacement	11/1/2005	20%
04-123	Sacramento	PG&E	12	194	126,232	• DHW boiler replacement • HVAC replacement • HVAC furnace make-up air units	12/1/2005	26%
04-135	Sunnyvale	PG&E	4	32	18,400	• Attic insulation • Wall insulation	11/1/2005	47%
04-203	Oakland	PG&E	3	2	1,820	• Wall insulation • Ceiling insulation • Floor insulation	12/1/2005	25%
04-202	Berkeley	PG&E	3	4	3,056	• Wall insulation • Ceiling insulation	8/1/2005	28%
04-103	San Diego	SDG&E	7	30	25,612	• DHW controls • Solar screens for windows	12/1/2005	24%
04-104	San Diego	SDG&E	7	11	6,253	• Wall insulation • Windows	8/1/2004	37%
04-105	San Diego	SDG&E	7	13	7,636	• Add Solar DHW • Windows • HVAC controls	12/1/2004	33%

Table 5-1
Summary of Multifamily Energy Efficiency Projects (2004-2005 DfC Program)

Project ID	City	IOU	Climate Zone	Number of Units	Square Footage	Measures Installed	Project Completed	Average Percent Improvement
04-201	San Diego	SDG&E	7	7	5,907	• Add Solar DHW • Windows • HVAC controls	12/1/2005	41%
04-101	San Diego	SDG&E	7	33	16,476	• Windows • DHW controls	4/1/2005	25%
04-122	Fallbrook	SDG&E	10	100	79,480	• Heat pumps • Attic insulation	10/1/2005	23%
04-120	Los Angeles	SCG	9	71	36,840	• DHW controls • DHW boiler replacement • HVAC replacement • Attic insulation	12/1/2005	9%
04-121	Los Angeles	SCG	9	46	34,732	• DHW controls • Insulation • Windows	12/1/2005	30%
04-128	Hollywood	SCG	7	27	11,906	• DHW controls • Attic insulation • Wall insulation • Windows • Heat pumps	11/1/2005	50%
04-140	Long Beach	SCE	6	29	15,723	• DHW controls • Attic insulation • Windows	12/1/2005	46%
04-168	Newbury Park	SCE	9	14	7,304	• Attic insulation • Wall insulation • Windows • HVAC	12/20/2005	55%
04-177	Long Beach	SCE	6	64	22,144	• Attic insulation • Windows • HVAC replacement	12/30/2005	30%

- *HVAC Systems.* About half of the projects involved some type of upgrade to the heating and/or cooling systems. Eleven projects affected the heating end-use (e.g., new central or wall furnaces, heat pumps, boilers, controls, tune-ups, etc.). Ten projects affected the cooling end-use (e.g., heat pumps, central systems, tune-ups, etc.).
- *DHW Systems.* Twelve projects involved improvements to the existing water heating systems – eight involved water heating demand control upgrades, two involved solar DHW installations, and two involved DHW boiler replacements.

Table 5-1 also shows that the average percentage improvement from the energy efficiency upgrades ranged from 20% to 55%.[3]

5.1.2 Reported v. Verified Gross Impacts

Table 5-2 shows HMG's reported gross energy savings impacts from the measures installed at these 20 sites. These impacts are compared to the verification results, and the realization rate (the "% Verified") represents the proportion of energy savings claimed by the program that was verified through this evaluation.

As mentioned above, in this analysis, the simulations were re-run in "non-compliance mode," which allowed us to modify values based on the actual observed and measured conditions of the buildings and affected equipment. Some of the conditions we changed in these simulations included:

- Input and/or output rates
- Thermostat settings
- Storage volume
- Insulation R-values
- Window data (e.g., type, size, orientation, shading)
- Building data (e.g., size, dimensions, configuration, orientation, etc.)

The simulations were re-run (using the updated input data) both with and without the program measure specifications to arrive at the verified energy savings estimates shown in Table 5-2. As shown, overall, 85% of the electricity (kWh) and demand reduction (kW) impacts were verified through the evaluation. The realization rate for the natural gas (therm) impacts is 101%.

[3] Since the program required a minimum of 20% improvement. There was one project that reported an average 9% improvement, which we assumed to be an error.

Table 5-2
Gross Energy Savings – Realization Rates from Verification Analysis
2004-2005 DfC Program, Multifamily Projects

Project ID	Reported Energy Savings Estimates			Verified Energy Savings Estimates			Realization Rates (% Verified)		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
04-107	1,130	6.22	5,778	900	4.95	5,825	80%	80%	101%
04-119	107,483	96.73	15,959	107,483	96.73	15,959	100%	100%	100%
04-125	4,045	6.47	1,969	3,460	5.54	1,969	86%	86%	100%
04-204	3,024	4.54	248	2,959	4.44	283	98%	98%	114%
04-123	593,038	889.56	3,397	452,211	678.32	3,421	76%	76%	101%
04-135	36,416	58.27	4,204	35,627	57.00	4,252	98%	98%	101%
04-203	294	1.62	232	294	1.62	232	100%	100%	100%
04-202	2,271	12.49	484	2,271	12.49	484	100%	100%	100%
04-103	2,126	4.25	1,388	2,066	4.13	1,349	97%	97%	97%
04-104	8,047	16.09	877	8,047	16.09	877	100%	100%	100%
04-105	1,879	3.76	865	1,879	3.76	852	100%	100%	98%
04-201	668	1.34	525	612	1.22	805	92%	92%	153%
04-101	16,675	33.35	471	16,675	33.35	695	100%	100%	148%
04-122	33,696	37.07	5,739	33,696	37.07	5,739	100%	100%	100%
04-120	8,869	12.42	2,501	8,869	12.42	2,501	100%	100%	100%
04-121	51,842	176.26	4,283	51,842	72.58	4,283	100%	41%	100%
04-128	2,326	4.65	3,697	2,326	4.65	3,697	100%	100%	100%
04-140	19,886	77.56	1,531	19,317	75.34	1,488	97%	97%	97%
04-168	30,392	42.55	1,471	30,614	42.86	1,476	101%	101%	100%
04-177	44,855	89.71	3,855	43,968	171.47	3,853	98%	191%	100%
All Projects	**968,963**	**1,575**	**59,476**	**825,117**	**1,336**	**60,041**	**85%**	**85%**	**101%**

5.1.3 Gross Impacts

As mentioned above, the actual gross impacts from the energy efficiency improvements are unlikely to be as significant as reported by HMG and verified through the analysis described above. This is largely due to the fact that energy savings from cooling end-uses are being accounted for when no cooling systems exist at the property. Table 5-3 presents the overall results when the cooling system savings are removed from the analysis. As shown, when cooling savings for projects with no existing cooling equipment are excluded, the realization rate for annual kWh saving is 67% and for peak kW reductions is 57%. The realization rate for annual therm savings does not change.

Table 5-3
Gross Energy Savings – Realization Rates without Cooling Impacts
2004-2005 DfC Program, Multifamily Projects

	Reported	Verified, With Cooling	Verified, Without Cooling	Realization Rate (% Verified, Without Cooling)
Annual kWh	968,963	825,117	652,519	67%
Peak kW	1,575	1,336	904	57%
Annual Therms	59,476	60,041	60,041	101%

5.1.4 Net Impacts

According to the program workbooks, an ex post net-to-gross ratio (NTGR) of 0.80 was used to calculate net savings.

The process evaluation survey included several questions that were used to assess net-to-gross issues. For example, participating owners/developers were asked how likely they would have been to have made energy efficiency improvements if the DfC Program and its financial incentives had not been available. The question used a five-point scale where 5 indicated "very likely" and 1 indicated "not at likely." We also asked a series of follow-up questions to get a better explanation of participant responses. In addition, participating owners/developers were asked about their main motivations for taking part in the DfC Program.

Table 5-4 shows the results from these questions for each of the owners/developers we interviewed. As shown, for the first four projects, the owners/developers we interviewed indicated that they would have been "not at all likely" to have made the energy efficiency improvements without the program. Responses to follow-up questions confirmed that the energy savings achieved through these projects should be 100% attributable to the program (NTGR = 1.0).

For the next five projects, the owners/developers were somewhat indifferent when it came to answering the direct likelihood question. However, there responses to the follow-up questions indicate that the program should be credited for influencing decisions related to the efficiency of the equipment installed. These owners/developers said that without the program, something different (less efficient, less costly, etc.) would have been implemented. Therefore, we recommend a modified NTGR of 1.0 be assigned to these projects as well.

Table 5-4
Summary of Net-to-Gross Results for Multifamily Energy Efficiency Projects

HMG Project ID	Annual kWh Savings [1]	Owner/Developer Incentive	Likelihood of Making EE Improvements without Program [2]	Direct NTGR	Additional Context for NTGR	Modified NTGR
04-123	452,211	$135,800	1	1.0	"Would have waited until the equipment "crashed and burned" before replacing it."	1.0
04-203	294	$3,000	1	1.0	"Definitely not at all likely to have made improvements without the program."	1.0
04-120	8,869	$49,700	1	1.0	"Would have waited until the equipment "crashed and burned" before replacing it."	1.0
04-128	2,326	$18,900	1	1.0	"The program influenced decision to install EE equipment (as opposed to standard EE)."	1.0
04-204	2,959	$12,000	2.5	0.63	"We had considered upgrade but costs outweighed benefits. Without the program, we probably would have done something different."	1.0
04-122	33,696	$70,000	2.5	0.63	"Rehab was already in process. The program allowed us to add the EE measures."	1.0
04-168	27,835	$9,800	2.5	0.63	"Had considered upgrade as part of strategic 3-year plan. But program parameters influenced EE decisions (otherwise would have tried to cut costs)."	1.0
04-168d	2,779	$9,800	2.5	0.63	"Had considered upgrade as part of strategic 3-year plan. But program parameters influenced EE decisions (otherwise would have tried to cut costs)."	1.0
04-125	3,460	$28,000	3	0.50	"Existing equipment was inefficient and needed to be replaced. Program helped make the right technology choices."	1.0
04-121	51,842	$32,200	2	0.75	"Organization already committed to EE, but program allowed improvements to happen sooner (otherwise would have had to wait 5+ years)."	0.75

HMG Project ID	Annual kWh Savings [1]	Owner/Developer Incentive	Likelihood of Making EE Improvements without Program [2]	Direct NTGR	Additional Context for NTGR	Modified NTGR
04-135	35,627	$22,400	3	0.50	"Some of the EE aspects of the project would have happened anyway but not in the same time frame and maybe not as comprehensively given the expense."	0.75
04-140	19,317	$20,300	3	0.50	"Projects may have gone forward but staged over 12+ month period."	0.75
04-119	107,483	$151,200	NA		"Projects were implemented to improve tenant comfort, EE benefits were secondary."	0.50
04-103	2,066	$21,000	NA		"Wanted to do something about the overall problem of energy costs. Also wanted to leverage funds from other sources (non-DfC)."	0.50
04-104	8,047	$7,700	NA		"Wanted to do something about the overall problem of energy costs. Also wanted to leverage funds from other sources (non-DfC)."	0.50
04-105	1,879	$9,100	NA		"Wanted to do something about the overall problem of energy costs. Also wanted to leverage funds from other sources (non-DfC)."	0.50
04-201	612	$10,500	NA		"Wanted to do something about the overall problem of energy costs. Also wanted to leverage funds from other sources (non-DfC)."	0.50
04-177	43,968	$44,800	NA		“Saving energy was just part of the rehab. There were other motivations (e.g., new/modern equipment, tenant benefits, property values)."	0.50
04-107	900	$44,100	NA			
04-202	2,271	$6,000	NA			
04-101	16,675	$14,700	NA			

[1] These values represent verified gross electricity savings (not reported).
[2] Likelihood represented on a scale of 1 to 5, where 1 means “Not at all likely” and 5 means “Very likely.”
NA = Question not asked or “don’t know” response given.

The program should be partially credited for influencing the timing of the next three energy efficiency projects (modified NTGR = 0.75) and, based on responses to the follow-up questions (the direct likelihood question was not asked/answered), the program should only be given partial credit for influencing energy efficiency decisions affecting the remaining six projects (modified NTGR = 0.50).

It is sometimes appropriate to weight participant responses to net-to-gross questions by the amount of energy savings achieved through the program and/or the amount of financial incentives received. This type of weighting allows us to account for net-to-gross responses relative to the size of the project. These values are also shown in Table 5-4 for each project.

In Table 5-5 below, we summarize the results of various analyses that provide range of NTGR for the program overall. As shown, the unweighted NTGR values range from 0.73 to 0.79. The savings-weighted NTGR ranges from 0.86 to 0.90, and the incentive-weighted values range from 0.79 to 0.86.

Table 5-5
Summary of Net-to-Gross Ratio Analysis for Multifamily Projects

	Average NTGR (Unweighted)	Average Savings-Weighted NTGR	Average Incentive-Weighted NTGR
Direct (Based on "Likelihood" question alone)	0.73	0.90	0.86
Modified (Based on direct "Likelihood" question and follow-up questions)	0.79	0.86	0.79

Given that these results are fairly consistent with the assumed value of 0.80 for the 2002-2003 Program, we do not recommend changing the NTGR applied to the 2004-2005 Program. Instead, we recommend that the California Public Utilities Commission (CPUC) conduct future studies designed to test alternative methods for calculating NTGRs for these types of multifamily programs.

Table 5-6 shows the net impacts attributable to the multi-family component of the 2004-2005 DfC Program based on the results of this evaluation. Looking at the realization rate for the program as designed (that is, using the compliance methods required to calculate impacts and retaining the energy savings from cooling end-uses), 68% of the electric energy and demand impacts can be attributed to the program and 81% of the natural gas impacts. If we assume that the cooling savings from projects where no cooling equipment exists will not be realized, then the net realization rates are 54% for annual kWh, 46% for peak kW, and 81% for annual therms.

Table 5-6
Evaluation Results – Energy Savings Impacts
2004-2005 DfC Program, Multifamily Projects

	Energy Savings		
	MWh	MW	Therms
Program Targets	431	0.64	88,320
Reported Gross Impact	969	1.57	59,476
Verified Gross Impact (with cooling)	825	1.34	60,041
Verified Gross Impact (without cooling)	653	0.90	60,041
Verified Net Impact (with cooling)	660	1.07	48,033
Verified Net Impact (without cooling)	522	0.72	48,033
Realization Rate (Verified Net with Cooling as Percent of Reported Gross)	68%	68%	81%
Realization Rate (Verified Net without Cooling as Percent of Reported Gross)	54%	46%	81%

5.2 Single-family Projects

As mentioned above, the single-family component of the 2004-2005 DfC Program assisted with the installation of furnaces, water heaters, and a water heater blanket. Table 5-7 presents the energy savings targets for this component of the program based on information provided in the program workbooks. As shown, the program fell short of its project goals in southern California but exceed its goals in PG&E's service territory. Overall, the program achieved only 57% of its targets for both numbers of units and energy savings.

Table 5-7
Summary of Program Goals and Reported Results
2004-2005 DfC Program, Single-family Projects

	Number of Units	kWh	kW	Therms
Goals from Workbooks				
PG&E	28	23,072	30.80	1,624
SCE	21	17,304	23.10	1,218
SCG	7	5,768	7.70	406
SDG&E	9	7,416	9.90	522
Total	65	53,560	71.50	3,770
Reported Results				
PG&E	32	26,368	35.20	1,856
SCE	1	824	1.10	58
SCG	1	824	1.10	58
SDG&E	3	2,472	3.30	174
Total	37	30,488	40.70	2,146
Reported Results as a Percent of Goal				
PG&E	32	114%		
SCE	1	5%		
SCG	1	14%		
SDG&E	3	33%		
Total	37	57%		

[1] Per unit savings assumptions: 824 kWh/year, 1.1 kW/year and 58 therms/year.

Source: Goals reported in HMG workbook submitted with program implementation plan. HMG provided a spreadsheet containing reported results once the program results were final.

5.2.1 Gross Impacts

As noted in Table 5-7 above, the program workbooks assumed a prescribed amount of energy savings per home for the single-family rehab projects. These assumed values were: 824 kWh/year, 1.1 kW, and 58 therms/year. However, only natural gas saving measures were installed through the program. Therefore, the program should not be credited for any of its reported electricity savings or peak demand reductions.

As part of the evaluation, we conducted an assessment of the natural gas savings impacts from the three types of measures installed through the single-family component of the program. The energy savings estimates were derived as follows:

- *Furnaces.* The California DEER database provides unit energy consumption (UEC) values for base efficiency and high efficiency furnaces installed in one of 16 climate zones. The following example assumes the measure was installed in Climate Zone 3 (San Francisco and the northern California coast) in a home that was constructed before 1978. About half of the projects were completed in Climate Zone 3 (or similar areas with respect to weather). In addition, most of the furnaces installed through the program were found to be 80% AFUE and, according to DEER, the standard UEC for a base efficiency (80% AFUE) furnace is 254 therms per year. By using the equation:

  Heating load = UEC * efficiency,

  we can calculate the standard heating load for a typical single family home in this climate zone.

  Due to the advanced age of the replaced equipment and the supposed lack of regular maintenance, it was assumed that the replaced equipment was 50% AFUE. Therefore:

  Savings = (heating load) * (1/replaced AFUE – 1/base AFUE) = 152 therms per year.

  However, our survey of participating homeowners revealed that only six of the 24 furnaces installed through the program were operational prior to being replaced. In these cases, we assumed that these homes were being heated either very inefficiently (poorly operating furnaces) or by some other method (e.g., stove, kerosene heater, etc.) and that this heating source was displaced as a result of the new installation. Therefore, we are not counting an increase in energy use as a result of participating in the program, but we are not counting any energy savings for equipment that replaced non-functional systems (especially when the new furnaces were not high efficiency furnaces but rather standard 80% AFUE furnaces).

- *Water heaters.* The California DEER database provides UEC values for base efficiency and high efficiency water heaters installed in single family homes. The standard UEC for a high efficiency (0.63 EF) water heater is 107 therms, while the standard UEC for a base efficiency (0.54 EF) water heater is 123 therms. Therefore, the average water heater load is 67 therms per year. An informal survey of the program documentation reveals that most of the installed water heaters were at or near 0.63 EF. Assuming that the replaced water heater is 80% as efficient as a standard base efficiency model, the savings are:
  Savings = high efficiency UEC – water heater load / (base efficiency*80%) = 48 therms per year.

- *Water heater blanket.* The California DEER database provides a standard energy savings of 13 therms per year for each installed water heater blanket.

A total of 37 single-family rehab projects were completed through the program. Table 5-8 shows the distribution of measures installed through these projects according to program records. To verify these installations, we conducted telephone interviews with 25 participating homeowners. As shown, 10 natural gas central furnaces were confirmed to have been installed in the homes included in the verification sample. One homeowner claimed that a central heating and air conditioning system was installed through the program (not a wall furnace as was indicated in the program records). Only twelve of the fifteen natural gas wall furnaces were confirmed to have been installed – in addition to the one just mentioned, there were two homes where two wall furnaces were installed but only one was reported to be working at the time of the interview. Finally, one homeowner claimed that a new natural gas water heater was also installed through the program.

Table 5-8
Distribution of Measures Installed and Verification Results
2004-2005 DfC Program, Single-Family Projects

Measure Type	Total Program Reported Measures	Verification Sample (n=25)			
		Reported Measures	Verified Measures	Verified Measures Replaced Operational Equipment	Realization Rate (% Verified and Replacing Operational Equipment)
Natural gas central furnace	15	9	10	4	40%
Natural gas wall furnace	20	15	12	2	17%
Natural gas water heater	7	5	6	6	120%
Water heater blanket	1	1	1	1	100%

As mentioned above, the program can only take credit for energy savings from new furnaces that replaced operational equipment. Through our interviews with participating homeowners, we learned that only 4 of the 10 verified natural gas central furnaces replaced operational equipment and only two of the 12 natural gas wall furnaces replaced operational equipment. (All of the water heating equipment was confirmed to have replaced operating equipment.)

Using the per unit energy savings assumptions described above, and the verification data presented in Table 5-8, we can calculate the actual savings from the natural gas measures installed through the program. This calculation takes into account that few of the natural gas central furnaces and wall furnaces replaced operating equipment and, as a result, few can be credited with gross energy saving impacts. The realization rate for natural gas gross impacts, therefore, is 85% of what was reported for the program overall. These results are shown in Table 5-9.

Table 5-9
Analysis of Gross Impacts from Natural Gas Measures
2004-2005 DfC Program, Single-Family Projects

	Reported Gross Impacts [1]	Actual Gross Impacts	Realization Rate (Actual as % of Reported)
	(Therms/Year)		
Natural gas central furnace	--	1,009	--
Natural gas wall furnace	--	407	--
Natural gas water heater	--	403	--
Water heater blanket	--	13	--
	--		
All Natural Gas Measures	2,146	1,833	85%

5.2.2 Net Impacts

According to the program workbooks, HMG used a value of 0.80 as its NTGR for the single-family component of the program. Given that the objective of this project was to provide financial assistance to organizations involved in the rehabilitation of homes where owners cannot afford to make the necessary improvements, it is probably a safe assumption that the measures would not have otherwise been installed had it not been for the financial incentives provided through the program. One could argue that the rehab organizations may still have done work on the home and, in fact, interviews with some of representatives who participated in the program indicated that the projects were underway when they learned about the additional funding the DfC Program could provide. However, it is also likely that the rehab projects may not have addressed the space heating and water heating systems had it not been for the program's unique focus on these measures. As a result of this, applying a NTGR of 0.80 for the gross energy saving impacts achieved through the program seems reasonable.

The final evaluation results for both gross and net impacts attributable to the single family component of the program are shown in Table 5-10.

Table 5-10
Evaluation Results – Energy Savings Impacts
2004-2005 DfC Program, Single-Family Projects

	Reported Gross Impacts	Actual Gross Impacts	Actual Net Impacts	Realization Rate (Actual Net as a Percent of Reported Gross)
Annual kWh	30,488	0	0	0%
Peak kW	40.7	0	0	0%
Annual Therms	2,146	1,833	1,466	68%

5.3 Energy Savings from EnergyWise Packs

As mentioned above, EnergyWise packs were distributed to tenants, homeowners and other industry professionals and stakeholders as part of the 2004-2005 program. An EnergyWise pack included two compact fluorescent lamps (CFLs) – one 15W and one 22W – a low-flow shower head, a faucet aerator, a dye tablet for toilets (to detect leaks), and an energy savings pamphlet. When distributed to tenants and homeowners, the packs were intended to be installed and result in verifiable energy savings. When distributed to others (at industry conferences, meetings and workshops), the packs were intended to both raise awareness and interest in the program, as well as to be installed and result in verifiable energy savings. HMG claimed energy savings impacts for 100% of the packs distributed.

Table 5-11 presents data on how each of the 2,000 EnergyWise packs were distributed. As shown, over half of the packs (53%) were distributed directly to homeowners and tenants, and 953 packs were distributed at conferences, meetings, workshops and other events.

Table 5-11
Distribution of EnergyWise Packs

	Number Distributed	Percent Distributed
Total EnergyWise Packs Reported	2,000	--
Distributed to tenants	**994**	**50%**
Distributed to homeowners	**53**	**3%**
Other	**953**	**48%**
Conferences	560	28%
Meetings	300	15%
Workshops	82	4%
Other unspecified	11	1%

Initially, program staff planned to obtain the names and contact information for all recipients of the EnergyWise packs for verification purposes. While contact information was obtained for many of the single-family homeowners and the meeting, conference and workshop attendees, very few of the tenants could be convinced to provide their contact information for verification purposes. As a result, our approach to verify the energy savings impacts from these packs involved contacting the property owners/managers by telephone to verify that the packs had been distributed to the tenants and the measures had been installed. A sample of the single-family homeowners and the meeting, conference and workshop attendees were also contacted by telephone to verify that the packs had been distributed to the tenants and the measures had been installed. A total of 25 single-family homeowners (68% of all receiving the packs) and 117 meeting, conference and workshop attendees (12%) were successfully contacted for the verification analysis.

As mentioned above, homeowners who had participated in the single-family rehab component of the program had been interviewed as part of the evaluation. These homeowners were also asked whether or not they received the packs. They were able to verify that 83% of the EnergyWise packs were in fact distributed through the program. Of the 117 meeting, conference and workshop attendees contacted, 90%

verified that the EnergyWise packs were received. In addition, multifamily property owners/managers were also contacted by telephone to verify that the reported number of EnergyWise packs had been distributed to the site. The majority (92%) were confirmed to have been received at the site. These results are shown in Table 5-12.

Table 5-12
Verification Results and Installation Rates for EnergyWise Packs
2004-2005 DfC Program

	Number of Packs	Percent of All Packs Distributed	Percent of All Packs Verified
EnergyWise Packs Reported	2,000		
Distributed to tenants at multi-family projects	994		
Distributed to single family homeowners	53		
Distributed to meeting, conference and workshop attendees	953		
EnergyWise Packs Verified (Received)	**1,818**	**91%**	
Received by multi-family property owners/managers	916	92%	
Received by single family homeowners	44	83%	
Received by meeting, conference and workshop attendees	858	90%	
CFLs	**1,220**	**61%**	**67%**
Installed by tenants or multi-family property owners/managers	577	58%	63%
Installed by single family homeowners	34	64%	77%
Installed by meeting, conference and workshop attendees	610	64%	71%
Low Flow Faucet Aerators	**884**	**44%**	**49%**
Installed by tenants or multi-family property owners/managers	646	65%	71%
Installed by single family homeowners	28	53%	64%
Installed by meeting, conference and workshop attendees	210	22%	24%
Low Flow Showerheads	**1,006**	**50%**	**55%**
Installed by tenants or multi-family property owners/managers	642	65%	70%
Installed by single family homeowners	30	57%	69%
Installed by meeting, conference and workshop attendees	334	35%	39%

Property managers, single family homeowners, and meeting, conference and workshop attendees were also asked about the specific measures included in the packs and whether or not these measures had been installed. As shown in Table 5-12, over half of the CFLs distributed through the EnergyWise packs (61%) have been installed, 44% of the faucet aerators have been installed, and 50% of the low-flow showerheads have been installed. Only 22% of the faucet aerators and 35% of the low-flow showerheads distributed to meeting, conference and workshop attendees have been installed.

The program used assumed values for the energy savings impacts from the measures included in the EnergyWise packs. As shown in Table 5-13, the program expected to achieve 182 MWh and 28,000 therms in annual energy savings and nearly 50 kW in peak demand reduction from these packs. However, using the installation rate results shown above, the evaluation could only verify that 61% of the anticipated electricity and demand savings and just under half (49%) of the natural gas savings were realized.

The NTGR for these measures is assumed to be 0.80, as reported in HMG's workbooks. The evaluation did not attempt to update the NTGR for the measures installed from the EnergyWise packs. Table 5-13 also shows the net impact results for the EnergyWise packs, along with the overall realization rates for this component of the program.

Table 5-13
Evaluation Results – Energy Savings Impacts
2004-2005 DfC Program, EnergyWise Packs

	Number of Packs	Annual kWh	Peak kW	Annual Therms
Reported Gross Impacts from All Packs Distributed	2,000	181,600	49.45	28,000
Verified Gross Impacts from All Packs Installed		110,816	30.18	13,592
Verified Net Impacts from All Packs Installed		88,653	24.14	10,874
Realization Rate (Verified Net Installed as Percent of All Packs Distributed)		49%	49%	39%

6. Appendix A: CPUC Reporting Tables

SCE Program Energy Impact Reporting for 2004-2005 Programs

Program ID*:	1147-04							
Program Name:	Designed for Comfort, Efficient Affordable Housing (EAH)							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Net Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004	21	7	0.0059	0.0019	3,617	572
	2	2005	138	39	0.2224	0.0381	13,453	6,519
	3	2006	138	39	0.2224	0.0381	13,453	6,519
	4	2007	138	39	0.2224	0.0381	13,453	6,519
	5	2008	138	39	0.2224	0.0381	13,453	6,519
	6	2009	138	39	0.2224	0.0381	13,453	6,519
	7	2010	138	39	0.2224	0.0381	13,453	6,519
	8	2011	138	39	0.2224	0.0381	13,453	6,519
	9	2012	118	32	0.2168	0.0362	13,453	6,519
	10	2013	96	24	0.2109	0.0343	13,453	6,519
	11	2014	96	24	0.2109	0.0343	13,453	6,519
	12	2015	96	24	0.2109	0.0343	13,453	6,519
	13	2016	96	24	0.2109	0.0343	13,453	6,519
	14	2017	96	24	0.2109	0.0343	13,453	6,519
	15	2018	96	24	0.2109	0.0343	13,453	6,519
	16	2019	96	24	0.2109	0.0343	9,848	5,954
	17	2020	96	24	0.2109	0.0343	6,915	5,492
	18	2021	96	24	0.2109	0.0343	6,915	5,492
	19	2022	96	24	0.2109	0.0343	6,915	5,492
	20	2023	96	24	0.2109	0.0343	6,915	5,492
	TOTAL	**2004-2023**	2,163	578	4.0999	0.6821	229,473	119,754

*Please complete this form for the SCE program ID included in the evaluation.
**Please include the definition of Peak MW used in the evaluation.
Definition of Peak MW as used in this evaluation:

Note, change the Program ID Number on the worksheet tabs (below), so that it matches the Progam ID Number of the program being evaluated.

PG&E Program Energy Impact Reporting for 2004-2005 Programs

Program ID*:	1146-04							
Program Name:	Designed for Comfort, Efficient Affordable Housing (EAH)							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004	43	24	0.0174	0.0065	6,949	3,545
	2	2005	851	502	1.1321	0.6413	46,056	33,162
	3	2006	851	502	1.1321	0.6413	46,056	33,162
	4	2007	851	502	1.1321	0.6413	46,056	33,162
	5	2008	851	502	1.1321	0.6413	46,056	33,162
	6	2009	851	502	1.1321	0.6413	46,056	33,162
	7	2010	851	502	1.1321	0.6413	46,056	33,162
	8	2011	851	502	1.1321	0.6413	46,056	33,162
	9	2012	814	478	1.1218	0.6348	46,056	33,162
	10	2013	774	453	1.1111	0.6280	46,056	33,162
	11	2014	774	453	1.1111	0.6280	46,056	33,162
	12	2015	774	453	1.1111	0.6280	46,056	33,162
	13	2016	774	453	1.1111	0.6280	46,056	33,162
	14	2017	774	453	1.1111	0.6280	46,056	33,162
	15	2018	774	453	1.1111	0.6280	46,056	33,162
	16	2019	774	453	1.1111	0.6280	39,479	29,863
	17	2020	774	453	1.1111	0.6280	34,128	27,170
	18	2021	774	453	1.1111	0.6280	34,128	27,170
	19	2022	774	453	1.1111	0.6280	34,128	27,170
	20	2023	774	453	1.1111	0.6280	34,128	27,170
	TOTAL	**2004-2023**	15,331	8,996	21.2860	12.0388	827,723	606,358

*Please complete this form for the PG&E program ID included in the evaluation.
**Please include the definition of Peak MW used in the evaluation.
Definition of Peak MW as used in this evaluation:

Note, change the Program ID Number on the worksheet tabs (below), so that it matches the Progam ID Number of the program being evaluated.

SDG&E Program Energy Impact Reporting for 2004-2005 Programs

Program ID*:	1149-04							
Program Name:	Designed for Comfort, Efficient Affordable Housing (EAH)							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004	14	7	0.0043	0.0018	2,335	957
	2	2005	93	49	0.1065	0.0507	14,212	10,070
	3	2006	93	49	0.1065	0.0507	14,212	10,070
	4	2007	93	49	0.1065	0.0507	14,212	10,070
	5	2008	93	49	0.1065	0.0507	14,212	10,070
	6	2009	93	49	0.1065	0.0507	14,212	10,070
	7	2010	93	49	0.1065	0.0507	14,212	10,070
	8	2011	93	49	0.1065	0.0507	14,212	10,070
	9	2012	79	42	0.1029	0.0489	14,212	10,070
	10	2013	66	36	0.0992	0.0471	14,212	10,070
	11	2014	66	36	0.0992	0.0471	14,212	10,070
	12	2015	66	36	0.0992	0.0471	14,212	10,070
	13	2016	66	36	0.0992	0.0471	14,212	10,070
	14	2017	66	36	0.0992	0.0471	14,212	10,070
	15	2018	66	36	0.0992	0.0471	14,212	10,070
	16	2019	66	36	0.0992	0.0471	11,911	9,137
	17	2020	66	36	0.0992	0.0471	10,040	8,376
	18	2021	66	36	0.0992	0.0471	10,040	8,376
	19	2022	66	36	0.0992	0.0471	10,040	8,376
	20	2023	66	36	0.0992	0.0471	10,040	8,376
	TOTAL	2004-2023	1,463	785	1.9435	0.9239	253,367	184,577

*Please complete this form for the SDG&E program ID included in the evaluation.
**Please include the definition of Peak MW used in the evaluation.
Definition of Peak MW as used in this evaluation:

Note, change the Program ID Number on the worksheet tabs (below), so that it matches the Progam ID Number of the program being evaluated.

SCG Program Energy Impact Reporting for 2004-2005 Programs

Program ID*:	1148-04							
Program Name:	Designed for Comfort, Efficient Affordable Housing (EAH)							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004	17	6	0.0049	0.0016	2,968	1,204
	2	2005	99	21	0.2039	0.0170	15,901	10,622
	3	2006	99	21	0.2039	0.0170	15,901	10,622
	4	2007	99	21	0.2039	0.0170	15,901	10,622
	5	2008	99	21	0.2039	0.0170	15,901	10,622
	6	2009	99	21	0.2039	0.0170	15,901	10,622
	7	2010	99	21	0.2039	0.0170	15,901	10,622
	8	2011	99	21	0.2039	0.0170	15,901	10,622
	9	2012	82	15	0.1993	0.0154	15,901	10,622
	10	2013	64	9	0.1944	0.0137	15,901	10,622
	11	2014	64	9	0.1944	0.0137	15,901	10,622
	12	2015	64	9	0.1944	0.0137	15,901	10,622
	13	2016	64	9	0.1944	0.0137	15,901	10,622
	14	2017	64	9	0.1944	0.0137	15,901	10,622
	15	2018	64	9	0.1944	0.0137	15,901	10,622
	16	2019	64	9	0.1944	0.0137	12,944	9,434
	17	2020	64	9	0.1944	0.0137	10,539	8,462
	18	2021	64	9	0.1944	0.0137	10,539	8,462
	19	2022	64	9	0.1944	0.0137	10,539	8,462
	20	2023	64	9	0.1944	0.0137	10,539	8,462
	TOTAL	2004-2023	1,492	268	3.7701	0.2861	280,687	193,189

*Please complete this form for the SCG program ID included in the evaluation.
**Please include the definition of Peak MW used in the evaluation.
Definition of Peak MW as used in this evaluation:

Note, change the Program ID Number on the worksheet tabs (below), so that it matches the Progam ID Number of the program being evaluated.

Sum Of Energy Impacts for This 2004-2005 Program

Program IDs*:	1146-04, 1147-04, 1148-04, 1149-04							
Program Name:	Designed for Comfort, Efficient Affordable Housing (EAH)							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004	95	43	0.0323	0.0118	15,869	6,278
	2	2005	1,181	611	1.6650	0.7472	89,622	60,373
	3	2006	1,181	611	1.6650	0.7472	89,622	60,373
	4	2007	1,181	611	1.6650	0.7472	89,622	60,373
	5	2008	1,181	611	1.6650	0.7472	89,622	60,373
	6	2009	1,181	611	1.6650	0.7472	89,622	60,373
	7	2010	1,181	611	1.6650	0.7472	89,622	60,373
	8	2011	1,181	611	1.6650	0.7472	89,622	60,373
	9	2012	1,092	567	1.6408	0.7354	89,622	60,373
	10	2013	999	522	1.6156	0.7231	89,622	60,373
	11	2014	999	522	1.6156	0.7231	89,622	60,373
	12	2015	999	522	1.6156	0.7231	89,622	60,373
	13	2016	999	522	1.6156	0.7231	89,622	60,373
	14	2017	999	522	1.6156	0.7231	89,622	60,373
	15	2018	999	522	1.6156	0.7231	89,622	60,373
	16	2019	999	522	1.6156	0.7231	74,182	54,388
	17	2020	999	522	1.6156	0.7231	61,622	49,499
	18	2021	999	522	1.6156	0.7231	61,622	49,499
	19	2022	999	522	1.6156	0.7231	61,622	49,499
	20	2023	999	522	1.6156	0.7231	61,622	49,499
	TOTAL	**2004-2023**	20,448	10,627	31.0995	13.9309	1,591,250	1,103,878

*This is the total energy impacts for the program across all IOU territories in which the program was implemented.
May be multiple ID numbers if implemented in more than one territory.
**Please include the definition of Peak MW used in the evaluation.

Definition of Peak MW as used in this evaluation:

7. Appendix B: Research Materials

7.1 Designed for Comfort Staff Interview Guide—2004

Explain purpose of interview
Provide assurances of confidentiality

Roles and Responsibilities

1. Briefly describe your roles and responsibilities concerning the Designed for Comfort program:

Program Goals

2. What do you think the overall goals of the Designed for Comfort program are?

Program Effectiveness

First I want to ask you some questions about program effectiveness. The initial questions concern the effectiveness of the Designed for Comfort program as a whole. The subsequent questions concern the particular part of the program that you are responsible for

3. In your opinion, how well is the overall Designed for Comfort program working?

What elements of the overall program are working well?
What elements of the overall program are working *less* well?
For the elements of the overall program that are working less well, how could these problems be remedied?

4. How well is the part of the program that your are responsible for working?

Which program elements, that you are responsible for, are working well?
Which program elements, that you are responsible for, are working *less* well?
For those program elements that you are responsible for, and which are working less well, how could these problems be remedied?

Internal Organization and Lines of Communication

Now I am going to ask you some questions about the organization of the program staff and lines of communication.

5. Who do you report to on the staff? About how often do you interact with this person concerning program issues?
6. Who else on the staff do you interact with frequently? What typically are the purposes of these interactions?
7. How well do you know the activities of other members of the program staff? How do you typically find out what other members of the program staff are doing?
8. What opportunities are there to share lessons learned and best practices with other members of the program staff?

9. In general, do you think the program staff structure is organized in an effective manner? Why or why not?
10. In general, do you think program information, ideas, and experiences are communicated effectively among the program staff? Why or why not?

General Program Design and Focus, Market Barriers

Now I am going to ask for your opinions about the general design and focus of the program as well as what you view to be the main external barriers to program success

11. Do you think the program, as currently designed, is focusing on the most appropriate market actors? Why or why not?
12. Do you think that the information and assistance that the program provides to market actors is sufficient to move market actors to promote and adopt energy efficient measures? Why or why not?
13. In addition to any already mentioned, what are the external barriers that discourage subsidized multi-family housing entities from adopting more energy-efficient measures?

Marketing and Outreach

Now I am going to ask you about program marketing and outreach activities

14. Are there marketing and outreach activities not mentioned in the monthly program reports that we should be aware of?
15. Which program marketing and outreach activities do you believe have been the most effective? Why do you say this?
16. Which program marketing and outreach activities do you believe have been less effective? Why do you say this?
17. Do program marketing materials provide clear, easy-to-understand explanations of program services and tools? Why or why not?
18. Does the program website provide clear, easy-to-understand explanations of program services and tools? Why or why not?
19. Are there any marketing and outreach activities that the program is not currently doing, and which are within the scope of the program budget, that you believe should be conducted? What are these activities? Why hasn't the program conducted these activities?

Program Tracking Databases

Now I am going to ask you about program tracking databases

20. Do you think the current program tracking databases are structured to support the management and planning functions of your program? Which functions does it support and how?
21. Does your program have adequate resources to support the use of the tracking system?
22. How much lag time is there typically between the time you receive relevant program data and the time it is entered into the tracking databases?
23. Are there any bottlenecks in information flow from field to database? If so, how could these be mitigated?

24. Are tracking system reports useful to program managers and field staff? How could they be improved upon?
25. Based on your experience, how accurate are the data in the program tracking databases?
26. In general, how could the existing tracking databases be improved?

Financial Incentives

Now I am going to ask you about program financial incentives

27. Do you think current *levels* of program financial incentives are adequate to encourage key market actors to implement energy efficiency measures? If not, what levels are needed?
28. Do you think current program financial incentives are properly structured to encourage key market actors to implement energy efficiency measures? If not, how could these incentives be better structured?
29. Are there types of financial incentives that the program is not currently offering, and which are within the scope of the program budget, that you believe should be offered? What are these financial incentives? Why hasn't the program offered them?

Training and Education

Now I am going to ask you about program training and education activities

30. Do you think that current program training and education activities are effective? Why or why not? Please distinguish as much as possible between training and education of PHA staff, private owners of subsidized housing, and tenants.
31. Are there program training and education activities that the program is not currently offering, and which are within the scope of the program budget, that you believe should be offered? What are these training and education activities? Why hasn't the program offered them?

Administrative and Reporting Responsibilities

Now I am going to ask about administrative and reporting responsibilities

32. Do you think the administrative duties imposed on program staff – such as activity tracking, application processing, expense reporting, etc. -- are reasonable?
33. Are there any administrative tasks that you find particularly onerous or unnecessary? What are these tasks?
34. Do you think the external reporting requirements imposed by the CPUC to be reasonable? Why or why not?
35. Do you think that the paperwork burden for program participants – e.g., filling out application forms – is reasonable? Why or why not?

Additional Comments and Observations

36. Are there any other comments or observations you would like to make about the Designed for Comfort that haven't already been mentioned?

7.2 Designed for Comfort Staff Interview Guide for 2006

Explain purpose of interview
Provide assurances of confidentiality

1. Reflecting back on the last two years of the Designed for Comfort program, please tell me what things went well and what things did not go well.

   a. Things that went well:

   b. Things that did not go well:

   c. For the things that did not go well, were there things that you could have done differently that would have led to a more positive outcome?

Note: If not mentioned, mention some of the following program challenges:

- Slow adoption of EEBUA
- Decision to change program design to allow non-EEBUA owners to get incentives
- Difficulties in getting HUD endorsement
- Difficulties with SF rehab organizations finding installers

2. Describe the nature of the Designed for Comfort going forward. What things will be done differently and why?

7.3 Interview Guide for Public Housing Authorities Not Participating in the Designed for Comfort Program

My name is Christopher Dyson. I am with KEMA Consulting. We've been hired by the California Public Utilities Commission to evaluate the Designed for Comfort: Efficient Affordable Housing (EAH) Program.

We were informed by the program that your public housing authority was approached about adopting an Energy-Efficiency Based Utility Allowances back in [DATE] but have not yet chosen to adopt it. I wanted to ask you a few questions about your decision. I am also hoping that you might be able to provide some suggestions on how this program might be improved.

[Provide assurances of confidentiality]

[Collect information about respondent's position with PHA, roles & responsibilities]

[Ask them whether they are familiar with the PHA's decision not to adopt the EEBUA. If they indicate otherwise, ask for an alternative contact]

1. First I would like to confirm the information provided by the program. Do you have any plans to adopt the Efficiency-Based Utility Allowances in the near term? If so, what your best estimate of a time schedule for doing so?

2. [IF THEY CONFIRM THEY HAVE NO PLANS TO ADOPT THE EFFICIENCY-BASED UTILITY ALLOWANCE] What were some of the reasons why you decided not to adopt the Energy-Efficiency Based Utility Allowances?

3. Do you think you would have adopted the Energy-Efficiency Based Utility Allowances if the program had marketed them or presented them in a different way? If so, what marketing or presentation approaches would have been more effective?

4. Do you think you would have adopted the Energy-Efficiency Based Utility Allowances if these had been designed in a different way? If so, what design changes would you have recommended?

4a) Have any developers of affordable housing in the jurisdiction of your Public Housing Authority expressed interest in the Energy Efficiency Based Utility Allowance?

5. How many properties do you manage that have Section 8 tenants? How many Section 8 units do you manage?

6. Is your Public Housing Authority planning to construct new affordable housing or retrofit existing affordable housing in the near future?

7. Have you recently made energy-efficiency improvements in your affordable multifamily housing through other California utility programs? Which programs?

8. Do you have any suggestions as to how the Designed for Comfort: Efficient Affordable Housing (EAH) Program can make the Energy-Efficiency Based Utility Allowance more appealing to Public Housing Authorities?

9. Do you think that your Public Housing Authority might adopt the Energy-Efficiency Based Utility Allowance some time in the long term?

7.4 Interview Guide for Owners/Developers Participating in Designed for Comfort Program

Interviewer: _____
Date of Interview: _____
Interviewee Name: _____
Interviewee Phone Number: _____
Company Name: _____
Company Address: _____
_____
_____

Introduction.
Purpose of interview.
Assurances of confidentiality
Approximate length of interview.

Builder/Developer Information

1. First I would like to get some background information about your company. Describe the nature of your organization and its involvement with affordable multifamily housing.

Sources/Levels of Program Awareness, Drivers of Program Participation

2. How did you first hear about the Efficient Affordable Housing program? What did they tell you about the program?

3. What motivated you to participate in this program? [If not already mentioned] What motivated you to install energy-efficient equipment in your multifamily buildings?

4. Has the EAH program provided you with any information about how the program works? What information?

5. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with this EAH program information? Why do you say that

6. Do you understand how an Energy-Efficiency Based Utility Allowance (EEBUA) works? Where did you learn this?

7. [If familiar with the EEBUA and EEBUA approved for their jurisdiction] How will the EEBUA affect the rent that will be collected from the tenants in the building?

Interaction with Public Housing Authorities and EAH Program

8. Did the Public Housing Authority (PHA) in whose jurisdiction you built the property at _____ ever approve an Energy-Efficiency-Based Utility Allowance (EEBUA)? [If so] Were you involved in helping to get the PHA to approve the EEBUA?

9. [If jurisdictional PHA approved EEBUA] Did the PHA staff tell you how this EEBUA would work? [If so] What did they tell you?

10. Did you have any interaction or communications with the staff of the Efficient Affordable Housing program? If so, what did these interactions/ communications concern?

11. Using a scale of one to five where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program staff? Why do you say that?

12. Did the EAH program staff provide you with any information about how the EEBUA would work? What did they tell you?

13. What energy-efficiency measures did you have installed at your property on _____

14. How did you find out which equipment qualified for rebates with the EAH program? Was the process for finding out equipment eligibility fairly straightforward?

15. Who installed the energy-efficient equipment? Did you have any difficulty obtaining this equipment or a contractor that could install it?

16. To the best of your knowledge were all the energy efficiency measures installed correctly? If not, what problems were encountered?

17. Once the equipment was installed, did anyone stop by your property to verify that the equipment had been installed? [If yes] who performed this inspection? What did this inspection involve?

18. [If they used a HERS rater for M & V] How did you find the HERS rater that you used for assessing the energy efficiency of your property?

19. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied were you with the process for assessing the energy efficiency of your property? Why do you say that?

20. Were you involved in filling out any of the paperwork needed for receiving the financial incentives from the EAH program? What paperwork do you recall?

21. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program's paperwork requirements? Why do you say that?

22. Have you received a rebate payment from the EAH program for the energy-efficient equipment that you installed? If so, how soon after the inspection did you receive a payment? Do you think that the payment was sent in a timely manner?

23. Using a scale of 1 to 5 where 5 = very likely and 1 = not very likely, what is the likelihood you would have implemented this project if the program and it's $_____ was not available?

24. Were you satisfied with the amount of rebates or financial incentives you received from the EAH program? Why or why not?

25. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program as a whole? Why do say that?

26. Would you recommend the EAH program to another owner/developer? Why do you say that?

27. Have the energy efficiency measures you installed produced the level of energy savings that you were expecting?

28. Have you collected any rent from your tenants so far? If so, will the EEBUA allow you to collect more in rent than you otherwise would have? How much more?

7.5 Interview Guide for Public Housing Authorities Participating in the Designed for Comfort Program

My name is Christopher Dyson. I am with KEMA Consulting. We've been hired by the California Public Utilities Commission to evaluate the Designed for Comfort: Efficient Affordable Housing (EAH) Program.

We were informed by the program that your public housing authority adopted an Energy-Efficiency Based Utility Allowances back in [DATE]. I wanted to ask you a few questions about your decision. I am also hoping to gather your impressions of the program and any suggestions you might have as to how the program might be improved.

[Provide assurances of confidentiality]

[Collect information about respondent's position with PHA, roles & responsibilities]

[Ask them whether they are familiar with the PHA's decision not to adopt the EEBUA. If they indicate otherwise, ask for an alternative contact]

Interviewer:
Date of Interview:
Interviewee Name:
Interviewee Phone Number:
Company Name:
Company Address:

Introduction.
Purpose of interview.
Assurances of confidentiality
Approximate length of interview.

Confirmation of Adoption

C1. First I would like to confirm the information provided by the program. According to their records, your organization adopted an Efficiency-Based Utility Allowance in [DATE]. This Energy-Efficiency-Based Utility Allowance was promoted by the Designed for Comfort: Efficient Affordable Housing (EAH) Program. Is this all correct?

Introduction to the Program

I1. First I would like to get some background information about your organization. Briefly describe what your organization does, what geographic area you cover, and what kind of housing that you own and manage.

_____ # Affordable MF buildings _____ # MF units _____#MF tenants

I2. How did you first hear about the Designed for Comfort: Efficient Affordable Housing (EAH) Program? What did they tell you about the program?

I3. What motivated you to participate in this program? [If not already mentioned]

I4. Has the EAH program provided you with any information about how the program works? What information?

Knowledge of and Drivers for the Energy-Efficiency Based Utility Allowance

First I want to talk about the process of adopting the Energy Efficiency-Based Utility Allowance.

K1. Very briefly, what is your understanding of how the Energy Efficiency Based Utility Allowance works?

K2. [If they are familiar with the EEBUA] Where did you learn about the Energy Efficiency Based Utility Allowance? How was the information presented to you?

K3. Were any of the affordable multifamily housing owners/developers in your jurisdiction advocating for the adoption of the Energy Efficiency Based Utility Allowance?

K4. Did the Designed for Comfort program mention any financial incentives that might be available to affordable multifamily builders/owners in your jurisdiction if you approved the Energy Efficiency Based Utility Allowance? If so, what did the program tell you?

K5. Did you provide the affordable multifamily housing owners/developers in your jurisdiction with any information about the Energy Efficiency Based Utility Allowance? If so, what sort of information?

Adoption of the Energy-Efficiency Based Utility Allowance

A1. What was the process for your organization's adoption of the Energy Efficiency Based Utility Allowance?

A2. Were there any obstacles in adopting this Energy Efficiency Based Utility Allowance? If so, what were these obstacles? How were these obstacles overcome?

A3. [IF NOT ALREADY MENTIONED] What did the Designed for Comfort program do to help your organization get the Energy Efficiency Based Utility Allowance adopted?

Implementation and Utilization of the Energy Efficiency Based Utility Allowance

I1. Once the Energy Efficiency Based Utility Allowance was adopted, were there any obstacles in implementing this Energy Efficiency Based Utility Allowance? How were these obstacles overcome?

I2. [IF NOT ALREADY MENTIONED] What did the Designed for Comfort program do to help your organization get the Energy Efficiency Based Utility Allowance implemented?

I3. About what percentage of the multifamily units that your organization owns/manages are eligible to adopt the Energy Efficiency Based Utility Allowance?

I4. Are any of the affordable multifamily owners/developers in your jurisdiction using the Energy Efficiency Based Utility Allowance? Do any others have plans to do so [IF SO, FIND OUT WHEN]?

I5. [IF USING EEBUA] What effect has the implementation of the Energy Efficiency Based Utility Allowance had on the rents that these affordable multifamily owners/developers charge their customers?

I6. Have any of the affordable multifamily owners/developers in your jurisdiction installed energy efficiency measures using rebates available through the Designed for Comfort Efficient Affordable Housing program? Which owners/developers?

Satisfaction with Program, Recommendations for Improvement

Now I would like to discuss your level of satisfaction with various aspects of the program

S1. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the information provided by the Designed for Comfort program explaining:
a1) The program in general?:

a2) Why do you say that?

b1) The Energy Efficiency Based Utility Allowance in particular?

b2) Why do you say that?

S2. What improvements do you think the program could make in terms of the information it provides concerning both the Energy Efficiency Based Utility Allowance and the program as a whole?

S3. What are your impressions of the Energy Efficiency Based Utility Allowance? What do you think are its advantages and disadvantages?

Now I would like to discuss your level of satisfaction with the support provided by the Designed for Comfort staff for both the adoption of the Energy Efficiency Based Utility Allowance and its implementation.

S4. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the staff support provided by the Designed for Comfort program for:

a1) The adoption of the Energy Efficiency Based Utility Allowance?:

a2) Why do you say that?

b1) The implementation of the Energy Efficiency Based Utility Allowance?

b2) Why do you say that?

S5. What improvements do you think the program could make in terms of the staff support it provides for both the adoption and implementation of the Energy Efficiency Based Utility Allowance?

Finally I would like you to provide a satisfaction rating for the program as a whole

S6a. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the Designed for Comfort program as a whole?

S6b. Why do you say that?

S7. What other improvements do you think the Designed for Comfort program should make besides those you may have already mentioned?

S8. Would you recommend this program to another Public Housing Authority? Why or why not?

S9. Have you shared your experiences with the Designed for Comfort Program with other Public Housing Authorities?

7.6 Interview Guide for HUD Officials Concerning the Designed for Comfort Program and the Energy Efficiency-Based Utility Allowance

Describe purpose of interview.
Give assurance of confidentiality

1. Briefly describe your position and role within HUD:

2. Describe how you first became aware of the energy-efficiency-based utility allowance and the Designed for Comfort program that promotes the concept?

3. What are your impressions of the EEBUA? What do you think are its advantages? What do you think are its disadvantages?

4. What are your impressions of the Designed for Comfort program? What do you think are its advantages? What do you think are its disadvantages?

5. The Designed for Comfort staff said that they tried to get HUD to endorse the EEBUA concept as early as 2002 and eventually gave up before trying again more recently. Do you know why it took so long for HUD to give explicit approval of the concept – especially so long after one of HUD's own periodicals mentioned the concept as a best practice?

6. Do you agree, as some have said, that HUD's decision to endorse the concept was driven by broader pressures for HUD to improve energy efficiency in the affordable housing sector?

7. One of the Public Housing Authorities that we interviewed said that HUD had approved the use of the EEBUA for new construction but not for retrofit situations. Do you know why HUD approved one and not the other?

8. Now that HUD has approved the EEBUA concept, is the department going to make any effort to publicize its approval to the Public Housing Authorities?

9. Do you think that the EEBUA concept could be implemented outside of California?

10. Do you think that HUD could be doing a better job of promoting energy efficiency in the affordable housing sector? Why do you say that?

7.7 Interview Guide for HERS Raters and Energy Consultants Participating in the Designed for Comfort Program

Interviewer: _____
Date of Interview: _____
Interviewee Name: _____
Interviewee Phone Number: _____
Company Name: _____
Company Address: _____
_____
_____
_____

Introduction.
Purpose of interview.
Assurances of confidentiality (comments will not be tied to individuals. When information is obviously from contractor, it will not be reported at all.)
Approximate length of interview.

Builder/Developer Information

First I would like to get some background information about your company.

1. Describe the nature of your business. What kind of work do you typically do? What kind of customers or market segments do you normal serve?

2. How many years have you been in business?

3. How many employees do you have?

4. About what percent of your company revenues come from the inspection and rating of multifamily properties?

Sources/Levels of Program Awareness, Drivers of Program Participation

5. How did you first hear about the Efficient Affordable Housing program? What did they tell you about the program?

6. What motivated you to participate in this program? [If not already mentioned]

7. Has the EAH program provided you with any information about how the program works? What information?

8. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with this EAH program information? Why do you say that?

9. Do you understand how an Energy-Efficiency Based Utility Allowance (EEBUA) works? Where did you learn this?

Involvement and Satisfaction with the EAH Program

10. How did you get involved with the EAH program projects that you did. Did HMG send a list of possible HERS raters to the owner/developer and they picked your name? Or was it based on an HMG recommendation? Or did other considerations (e.g., proximity to building site) come into play?

11. Describe the typical process for conducting an inspection and energy assessment of a multifamily building that received rebates through the EAH program. Please note any significant variations from this typical process.

[Prompt if necessary]
Process for initial inspection and collection of baseline information
Process for making recommendations as to EE equipment to the building owner
Process for post-installation inspection and final calculation of energy savings.
Process for training and education (tenants, SF rehab organizations)

12. What were the nature of the interactions or communications with the staff of the Efficient Affordable Housing program?

13. Using a scale of one to five where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program staff? Why do you say that?

14. How did you find out which equipment qualified for rebates with the EAH program? Was the process for finding out equipment eligibility fairly straightforward?

15. Did you have any involvement with the installation of the equipment – in terms of recommending an installation contractor or facilitating the acquisition of the equipment?

16. What logistical challenges, if any, did you encounter when carrying out your duties with the Efficient Affordable Housing program?

17. What are the advantages of the approach that you are using to calculate the energy savings? What are the disadvantages?

18. Were you involved in filling out any of the paperwork needed for receiving the financial incentives from the EAH program? What paperwork do you recall?

19. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program's paperwork requirements? Why do you say that?

20. You were scheduled to receive rebate payments from the EAH program for your duties ad HERS rater and/or energy consultant. Were all these payments received in a timely manner?

21. Were you satisfied with the amount of rebates or financial incentives you received from the EAH program? Why or why not?

22. Would you recommend the EAH program to another HERS rater or energy consultant? Why do you say that?

23. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the EAH program as a whole? Why do you say that?

7.8 Charitable Volunteer Rehab Organization Interview Guide

Explain purpose of interview
Provide assurances of confidentiality

Introduction to the Program

I1. First I would like to get some background information about your organization. Briefly describe what your organization does, what geographic area you cover, and what kind of housing that you build and rehab.

I2. How did you first hear about the Designed for Comfort: Efficient Affordable Housing (EAH) Program? What did they tell you about the program?

I3. What motivated you to participate in this program? [If not already mentioned]

I4. Has the EAH program provided you with any information about how the program works? What information?

Program Process

P1. The description of the Designed for Comfort program said that it provide an equipment rebate for the cost of equipment purchases up to $2,500 per address. What was the process of applying for these rebates?

P2. The program description says that the rebated equipment must be installed as volunteer labor or as a volunteer service provided by the contractor selling the equipment. Is this how the installation occurred? If not, who did the installation?

P3. The program description says that the program would verify that the installers were qualified. Do you know if the program did this or not? If so, how was this done?

P4. Using a scale of one to five where 5 equals "Very likely" and 1 indicates "Not at all Likely," how likely would you have installed these measures if the program had not provided the rebates or other financial assistance?

P5. [If they would have likely done it anyway] Would the equipment you installed be as energy-efficient as the equipment installed through the program?

P6. The program description says that the HMG staff will perform HERS inspections of installations for qualifying projects and provide final inspections. Did these inspections take place as described? If not, how?

P7. The HMG staff was also supposed to conduct training sessions to educate the rehab organizations on performing energy audits and determining the most cost-effective energy efficiency upgrades. Do you recall this training element of the program? How did it work?

Satisfaction with Program, Recommendations for Improvement

Now I would like to discuss your level of satisfaction with various aspects of the program

S1. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the information provided by the Designed for Comfort program?

S1a. Why do you say that?

S2. What improvements do you think the program could make in terms of the information it provides?

S3. Using this same satisfaction scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," please rate your satisfaction with various aspects of the rebate process. First how satisfied have you been with the program's process for applying for the rebates?

S3a. Why do you say that?

S4. Using this same satisfaction scale, please rate your satisfaction with the program's process for paying the rebates?

S4a. Why do you say that?

S5. Using this same satisfaction scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," please rate your satisfaction with the programs efforts to insure that the energy-efficient equipment was properly installed?

S5a. Why do you say that?

S6. Using this same satisfaction scale, please rate your satisfaction with the program's process for training your organization on performing energy audits and determining the most cost-effective energy efficiency upgrades?

S6a. Why do you say that?

S7. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the staff support provided by the Designed for Comfort program?

S7a. Why do you say that?

S8. Using a scale where 1 means "Not at all satisfied" and 5 means "Completely satisfied," how satisfied have you been with the Designed for Comfort program as a whole?

S8a. Why do you say that?

S9. What other improvements do you think the Designed for Comfort program should make besides those you may have already mentioned?

S10. Would you recommend this program to another Voluntary Rehab Organization? Why or why not?

S11. Have you shared your experiences with the other Voluntary Rehab Organizations?

7.9 Design for Comfort Single Family Survey

1 Contact Information

Project number	«project_num»
Phone number	«phone_num»
Name	«contact_name»
Street address	«address»
City	«city»
Zip	«zip»

2 Familiar Respondent

r1. Hello, may I please speak with «contact_name»?

[IF Contact UNAVAIL, SPEAK W/ ANY ADULT "Perhaps you can help me"]

Contact Available……. 1
Contact currently unavailable……... 2
Another familiar adult available ……. 3
No familiar adult available…… 4
No contact……. 5

r2. My name is Kate Dresher and I'm calling from KEMA on behalf of the California Public Utility Commission. Let me assure you this is not a sales or marketing call. Rather, I'm calling about the energy efficient equipment that was installed in your home with the assistance of «assist_org» and the Designed for Comfort Program.

We are doing an evaluation of the Designed for Comfort Program, and so I'm calling to talk with you briefly about your experiences with the program and the equipment that was installed. The call will only take about 5-10 minutes.

Are you familiar with the project?

Yes…….[GO TO r5]…. 1
No……..[GO TO r3]…. 2

r3. Is there someone in the house who is familiar with the project?

Yes……["May I please speak with them?]……..…….[GO TO r2]…. 1
No…….[GO TO r4]…. 2

r4. What would be the best time to call back?

_____

r5. Is now a good time to talk?

Yes……[GO TO s1]…...1
No……[Can we schedule a time for me to call back?]…. 2
Refused…….["Thank you for your time. Good-bye"]…. 3

SCHEDULED CALL BACK DAY / TIME _____

3 Survey

3.1 Installation Verification

iv1. According to our records, your home at «address» in «city» received a new «meas1_installed» in «date1_installed» and a «meas2_installed» in «date2_installed».

Is that correct?

Yes…….	1
No……["What is not correct?" LIST BELOW]….	2
Don't Know……	3
Refused……..	4

_____

iv2. Has the equipment been installed?

Yes…….	1
No……..…["Why not?" LIST BELOW]…..	2
Don't Know……	3
Refused……..	4

_____

iv3. Is the equipment still working?

Yes…….	1
No……..…["Why not?" LIST BELOW]……	2
Don't Know……	3
Refused……..	4

Ex: Broken? Replaced or Removed? Why?

_____

_____

iv4. Now I'd like to verify that the equipment installed is the same as in our records.
Is it possible for you to go look at the «meas1_installed», so I can confirm our information about it?

The «meas1_installed» was made by «meas1_manuf», correct?

Yes…….	1
No……..["Who is the manufacturer?" RECORD BELOW]…..	2
Don't Know……	3
Refused……..	4

_____

iv5. Can you read the model number?

Yes……[RECORD BELOW]…. 1
No……..….. 2
Don't Know…… 3
Refused…….. 4

_____

iv6. Could you also go look at the «meas2_installed», so I can confirm our information about it as well?

The «meas2_installed» was made by «meas2_manuf», correct?
Yes……. 1
No……..["Who is the manufacturer?" RECORD BELOW]…... 2
Don't Know…… 3
Refused…….. 4

_____

iv7. Can you read the model number?
Yes……[RECORD BELOW]…. 1
No……..….. 2
Don't Know…… 3
Refused…….. 4

_____

3.2 Creating project recall

Now I have a few questions about your satisfaction with the new equipment and the process of it getting installed.
[PROBE ANYTHING THAT SEEMS NOT QUITE RIGHT]

cr1. Are you happy with the new «meas1_installed» and «meas2_installed»?
Yes……..…. 1
No……..….. 2

Comments _____

cr2. Have you noticed an increase in the comfort of your home since it was installed?
Yes…… 1
No……..….. 2

Comments _____

cr3. Have you noticed a decrease in your utility bills since it was installed?
Yes……..…. 1
No……..….. 2

Comments _____

cr4. Do you know who actually installed the equipment?

Yes……[RECORD BELOW]….	1
No……..…....	2

Comments _____

_____

cr5. Were you happy with their work?

Yes……..….	1
No……..…....	2

Comments _____

3.3 Retrofit verification-Measure1

Next I have a few questions about the equipment that was in your home prior to the new equipment being installed.

rv1_1. Regarding the new «meas1_installed», it replaced an old «meas1_installed», correct?

Yes……	1
No……["Did you not have one before?" RECORD BELOW]…...	2
Don't Know……	3
Refused……..	4

_____

rv2_1. Was the old «meas1_installed» working when the new one was installed?

Yes……	1
No…….	2
Don't Know……	3
Refused……..	4

rv3_1. Were you having any problems with the old «meas1_installed»?

Yes……	1
No……["Did you not have one before?" RECORD BELOW]…...	2
Don't Know……	3
Refused……..	4

rv4_1. About how old was the old «meas1_installed»? [RECORD BELOW]
(Can you remember about when it was installed)?

Age (in years)……	__
Don't Know……..	3

Refused……. 4

Comments: _____

3.4 Attribution - Measure1

a1_1. How likely would you have been to install a new «meas1_installed», anyway? Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)…… 1
2……... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don't Know…… -97
Refused……... –98

Comments_____

a1a_1. IF a1_1 = "3" , "4" or "5", When do you think you might have installed it?
Month/Year …….…….._____
Don't Know ……...…… -97
Refused …….. –98

Comments_____

a2_1. How likely would you have been to install a «meas1_installed» with the same energy efficiency rating as the one that was installed through the program?
Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)…… 1
2……... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don't Know…… -97
Refused……... –98

Comments_____

a3_1. How important a role did the equipment dealer, installation contractor or other supplier play in the decision to make this energy efficient improvement?
Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)……	1
2……....	2
3……..	3
4……..	4
5 (very likely)…….	5
Don't Know……	-97
Refused…….....	–98

Comments _____

a4_1. How important a role did assistance provided by «assist_org» play in the decision to make this improvement—this includes the financial, installation and any other assistance the program provided?
Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)……	1
2……....	2
3……..	3
4……..	4
5 (very likely)…….	5
Don't Know……	-97
Refused…….....	–98

Comments _____

3.3 Retrofit verification-Measure2

Finally, I'd like to ask you these same questions about the «meas2_installed».

rv1_2. Regarding the new «meas2_installed», it replaced an old «meas2_installed», correct?

Yes……	1
No……["Did you not have one before?" RECORD BELOW]…...	2
Don't Know……	3
Refused……..	4

_____

rv2_2. Was the old «meas2_installed» working when the new one was installed?

Yes……	1
No…….	2
Don't Know……	3
Refused……..	4

rv3_2. Were you having any problems with the old «meas2_installed»?

Yes……	1

No……[“Did you not have one before?” RECORD BELOW]…... 2
Don’t Know…… 3
Refused…….. 4

rv4_2. About how old was the old «meas2_installed»? [RECORD BELOW]
(Can you remember about when it was installed)?
Age (in years)…… __
Don’t Know…….. 3
Refused……. 4

Comments: _____

3.4 Attribution – Measure2

a1_2. How likely would you have been to install a new «meas2_installed», anyway? Use a scale of 1 to 5 where 1 means “not at all likely” and 5 means “very likely”.

1 (not at all likely)…… 1
2……... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don’t Know…… -97
Refused……... –98

Comments_____

a1a_2. IF a1_1 = “3” , “4” or “5”, When do you think you might have installed it?
Month/Year ……..…….._____
Don’t Know ……...…… -97
Refused …….. –98

Comments_____

a2_2. How likely would you have been to install a «meas2_installed» with the same energy efficiency rating as the one that was installed through the program?
Use a scale of 1 to 5 where 1 means “not at all likely” and 5 means “very likely”.

1 (not at all likely)…… 1
2……... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don’t Know…… -97
Refused……... –98

Comments_____

a3_2. How important a role did the equipment dealer, installation contractor or other supplier play in the decision to make this energy efficient improvement?
Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)…… 1
2…….... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don't Know…… -97
Refused……... –98

Comments _____

a4_2. How important a role did assistance provided by «assist_org» play in the decision to make this improvement—this includes the financial, installation and any other assistance the program provided?
Use a scale of 1 to 5 where 1 means "not at all likely" and 5 means "very likely".

1 (not at all likely)…… 1
2…….... 2
3…….. 3
4…….. 4
5 (very likely)……. 5
Don't Know…… -97
Refused……... –98

Comments _____

8. Appendix C: Interim Reports

8.1 Interviews with Nonparticipating Public Housing Authorities

MEMORANDUM

TO: Julieann Summerford, Nehemiah Stone, Charles Ehrlich, and Puja Maglani of Heschong Mahone Group

DATE: June 30, 2005

FROM: Christopher Dyson and Kathleen Gaffney of KEMA Inc.

RE: Interviews with nonparticipating Public Housing Authorities

CC:

1. Introduction

The purpose of this memorandum is to summarize interviews that KEMA conducted with six Public Housing Authorities (PHAs) that had not adopted the Energy-Efficiency Based Utility Allowance (EEBUA) despite the efforts of the Efficient Affordable Housing (EAH) program. These interviews were conducted in May and June of 2005.

The EAH program manager had identified twelve PHAs that had not adopted the EEBUA despite expressing initial interest and listening to presentations by EAH program staff. Of these twelve, the program manager had identified three PHAs that the EAH program still hoped to recruit. Therefore KEMA attempted to contact the remaining nine. KEMA was able to complete interviews with six of these nine PHAs. A seventh PHA was unable to complete the interview because the knowledgeable staffperson had departed. Two other PHAs did not return KEMA's repeated phone calls. All interviews were conducted with members of the PHA that the EAH program had identified as key contacts in its tracking database.

Due to assurances of confidentiality, this memorandum will not attribute any comment to a particular PHA.

2. The Interview Findings

a. Why the PHAs did not adopt the EEBUA

KEMA asked the six PHAs why they had not adopted the EEBUA. They gave eleven different reasons with only three of these being cited by more than one respondent. The reasons included:

- *The cost savings from the EEBUA was not large enough.* Three of the PHAs cited this as a contributing factor for why they had not adopted the EEBUA. One said that the small difference between their standard utility allowance and the EEBUA "made it easier to the put the EEBUA on the back burner." Another said that the mild weather in their area meant that energy bills were relatively small to begin with and this made the EEBUA savings even smaller in absolute dollar terms. He also said that his PHA already subsidized the UA to a great extent. A third PHA said that small payouts from the EEBUA was one of the reason why developers in its jurisdiction were not very enthusiastic about adopting the EEBUA.
- *The EAH program did not adequately show how PHAs would benefit from the EEBUA.* Two PHAs cited this is as a reason why they did not adopt the EEBUA. They both claimed that the EAH

program presentation put too much emphasis on how the program would benefit the developers and did not make the case for benefits to the PHA and its tenants. "I don't care how it is going to benefit some private developer," one PHA official remarked. Another said that it would have been very persuasive if the EAH program had presented a case study of another PHA, similar in size and character to their own, that had adopted the EEBUA and had a positive experience.

- *The PHAs had been too busy to pay enough attention to the EAH program* – Two PHAs cited this as reasons why they did not adopt the EEBUA. They pointed to dealing with cuts in Section 8 funding as one major distraction that made it easier to put the EEBUA on the "back burner." One PHA official had also been involved in a major property acquisition and these negotiations had kept her from paying attention to the EAH program proposal.

Other reasons cited by a single PHA for not adopting the EEBUA included:

- *Concerns about the administrative burden of the EEBUA* – One PHA official said that although he realized that the EAH program was offering assistance in administering the EEBUA, he feared that "this might go away and we would be left holding the bag." "We were concerned that when the dust settled we would be responsible for the bulk of the work," he added.
- *Concerns about maintaining two utility allowances* – One PHA official felt uncomfortable carrying different Utility Allowances at the same time. "We thought it would bring an unnecessary level of complexity to the process," he said. He was also concerned that the EEBUA would cause difficulties with the software they use to calculate the utility allowances.
- *Inability to get buy-in from the developers* – One official said that "the inability to get buy-in from the developers" about the EEBUA made it difficult to go forward with the concept. The feedback of the developers was that "the concept required more analysis" and that they weren't sure that the energy savings from energy-efficiency improvements would give them the necessary return on investment. A meeting that was held for developers to explain the EEBUA was not well attended. He thought that the EAH program should have done more "handholding" to make sure that the developers understood the benefits of the EAH.
- *Poor communications* – One PHA official said "it took too long to get the gist of what [the EAH program] wanted" from the PHA. He said that it required multiple emails and meetings to understand what the EEBUA was all about and what the PHA had to do. These delays hindered its adoption.
- *Complaints about the EAH program exerting excessive pressure for adoption* – One PHA official said that the EAH program came on too strong to get him to adopt the EEBUA and even tried to exert pressure by publicizing his delays in adopting the EEBUA to city officials.
- *Skepticism about energy savings* – One PHA official who claimed to already build and maintain energy-efficient housing was skeptical that the EAH program would deliver the promised energy savings. He felt that the EAH program did not provide a clear explanation of the baseline assumptions and how the energy savings could be achieved. He also noted that it was difficult to get access to tenant utility bills to try to verify energy savings.
- *Bad timing* – One PHA official said that his PHA had just adopted a new standard utility allowance when the EAH program approached them. This added to the PHA's confusion and made the PHA less willing to create a second utility allowance so soon afterwards.
- *Dispute between a PHA and their city* – One PHA said that they had wanted to adopt the EEBUA but they had a poor relationship with their city and only the city could adopt the EEBUA.

b. Whether A Different Presentation Would Have Increased the Change of EEBUA Adoption

KEMA asked the PHA officials whether the EEBUA would have had a better chance of adoption if it had been presented in a different manner. Four of the six said no. They generally thought that the EAH program had done a good job of explaining the EEBUA. A couple of these PHAs did admit that they did not grasp the concept on the first take and follow-up information and explanation was needed. However, all four said that the EEBUA had not been adopted for other reasons besides how it was presented to them.

Two of the PHA officials did say that the EAH program's presentation of the EEBUA was influential in them not adopting it. As discussed in the previous section, both of them were turned off by too much emphasis on how the EEBUA would benefit developers and not enough on how it would benefit the PHA and its tenants. One PHA official wished that the EAH program had provided a case study of another PHA, similar in size and character to his own, that had adopted the EEBUA and had a positive experience. He wished that this case study would contain information such as the level of PHA staff involvement, the extent of developer involvement, the nature of the construction or retrofit projects, and most importantly how the PHA and the tenants benefited.

Both of these PHA officials also wished that the EAH program had informational materials that provided a more concise explanation of both how the EEBUA worked and how energy savings would be achieved. One official said that more visuals and more simplified terminology would have helped. He thought that much of the EAH program information was too long and dense. "If you want me to understand that you're talking about *Moby Dick*, show me a white whale," he said. "Don't make me read *Moby Dick*."

c. Whether A Different EEBUA Design Would Have Increased the Chance of EEBUA Adoption

KEMA asked the PHA officials whether the EEBUA would have had a better chance of adoption if it had been designed in a different manner. Four of the PHAs said that design changes would have improved the chance of adoption. Two of the PHAs reiterated that the EAH program placed too much emphasis on helping developers instead of helping PHAs and their tenants. The one PHA that was unable to adopt the EEBUA because of poor relations with its city hoped that the program could be changed so that city approval was not necessary. One PHA wondered whether the small differences in energy costs between the EEBUA and the standard utility allowance could be increased through some sort of program redesign.

d. Other suggestions for improvement

In addition to these recommended changes in EEBUA presentation and design, the PHAs suggested a few other ways that the EAH program, or the Heschong Mahone Group (HMG) itself, could be more helpful for them. One PHA official suggested that the EAH program do more education and training, especially for some of the smaller PHAs. She said that cuts in her Section 8 funding meant that she could no longer afford to attend affordable housing conferences. She thought that other small PHAs were in a similar situation. Therefore she recommended that the EAH program conduct a seminar to educate PHAs about the EEBUA. She even offered to host it. The seminar would invite all the PHAs in her region.

Two PHA officials suggested ways that HMG could help them improve their energy efficiency without using the EAH program. One official said that it would be helpful if HMG could function as a liaison that could inform them of all opportunities for energy efficiency assistance for affordable housing, not just the EAH program. He observed that it was difficult for PHA officials to keep track of all these opportunities on their own. Another PHA official saw a use for HMG as a measurement and verification service. He noted that there are some PHAs that want to make energy-efficiency improvements in their properties, but do not wish to work with a performance contractor. He thought that HMG could help such PHAs to determine their energy baselines and then measure the energy saving that result from the energy efficiency improvements.

e. Developer interest in the EEBUA

KEMA asked the PHA officials whether any of the developers in their jurisdiction had shown interest in the EEBUA concept. Only two PHA officials said that there was developer interest in the EEBUA. One of these PHAs owns a development company that is planning to use incentives from the EAH program. KEMA did not ask the PHAs whether they had educated their developers about the EEBUA. However, a couple of the PHAs said that they normally do not have much contact with developers of affordable housing – this function was handled by a separate city development authority. Therefore it is possible that the lack of developer interest was mainly due to unawareness of the EEBUA rather than any negative reaction to it.

f. Participation in other California Energy Efficiency Programs

KEMA asked the PHA officials whether they had recently made energy efficiency improvements with assistance from other California utility energy efficiency programs. One purpose of this question was to find out whether their lack of interest in the EEBUA might be because they are getting energy efficiency assistance from other California programs. Another purpose of the question was to get some sense of how proactive these PHAs have been about energy efficiency in recent years.

Only two of the PHAs reported recently dealing with other California energy efficiency programs. One PHA reported getting some refrigerators and fans replaced using contractors working with PG&E's Spectrum program. Another PHA is currently trying to get rebates from SCE for some security lighting it installed. One of the PHA officials also said that her PHA is planning to make energy efficiency improvements in its public housing units through a HUD program. The program encourages PHAs that own public housing to work with Energy Service Companies (ESCOs) to make energy efficiency improvements using performance contracts.

g. Chances of adopting the EEBUA in the near future

KEMA asked the PHAs whether they might adopt the EEBUA at some time in the near future. Three of the PHA officials said that they had not closed the door on the EEBUA and might reconsider it if it was presented in a different manner. Two of them said it was important that any subsequent presentation of the EEBUA show how it would benefit PHAs and tenants, with much less emphasis on developer benefits. One of the PHA officials also said that it was important for the EAH program to clearly explain how the energy savings would be achieved and measured. Finally two of the officials said that it would

be very useful for the EAH program to provide case studies of other PHAs (hopefully similar to their own) that had successfully participated in the program. Such case studies should openly document any administrative costs that the PHAs incurred after adopting the EEBUA.

8.2 Program Theory, Metrics and Performance

MEMORANDUM

TO: Julieann Summerford, Nehemiah Stone, Charles Ehrlich, and Puja Maglani of Heschong Mahone Group

DATE: September 15, 2004

FROM: Christopher Dyson and Kathleen Gaffney of KEMA Inc.

RE: Program theory, metrics, and performance – based on staff interviews and document review

CC:

1. Introduction

The purpose of this memorandum is to:

- *Outline the program theory.* This includes defining the high-level objectives of the Efficient Affordable Housing (EAH) program, discussing the market or bureaucratic barriers that the program faces, and describing how the program proposes to overcome these.
- *Summarize program metrics.* Program goals and milestones developed in the program proposal are summarized here.
- *Describe program performance to-date*. This includes a description of the program's achievements, as well as its process and implementation challenges, after eight months of operation.

The findings in this memorandum are based on lengthy interviews with the program staff in late July and early August 2004 as well as a review of key program documents. These findings are necessarily preliminary, not only because the program is only eight months old, but also because the evaluation staff has yet to interview any program participants or non-participants.

An evaluation of the program tracking databases will be covered in a separate memorandum.

2. The Efficient Affordable Housing (EAH) Program Theory

In order to properly evaluate an energy-efficiency program it is important to understand the program's high-level objectives, the environment that the program is operating in, what particular changes the program aims to achieve in this environment, and what challenges it will face in attempting to implement these changes. Only by understanding these things can a program evaluator fairly assess a program's performance.

a. Program Background

The 2004-2005 *Designed for Comfort:* Efficient Affordable Housing (EAH) program is the successor to earlier versions of the Efficient Affordable Housing program that operated before 2004. Key ways that the 2004-2005 program differs from its predecessor include:

- The program is now statewide. The predecessor was only a regional program.
- The budget of the program has increased substantially – from $480,000 to $2.6 million.
- New program elements include:
    - Financial incentives for qualified tenants and single-family home owners working with Volunteer Rehab Organizations,

- Financial incentives for HERS raters and Energy Consultants,
- Caps on the amount of incentive money that can be distributed to a given Public Housing Authority (PHA),
- Different incentive levels for small and large projects, and
- Energy Efficiency-Based Utility Allowance (EEBUA) administration/implementation services available for PHAs.

The per-PHA incentive cap was not part of the original 2004-2005 proposal but is something that the program has recently requested in a change order.

b. The High-Level Objectives of the Efficient Affordable Housing (EAH) Program

The ultimate objective of the "*Designed for Comfort:* Efficient Affordable Housing (EAH) program – according to its main marketing brochure – is "to promote energy efficiency and comfort in affordable housing." Interviews with program staff and a review of other program documents confirmed that this was the ultimate program objective.

However, these sources also identified some other key program goals that are more concrete and specific in nature. For example, the proposal for the 2004-2005 statewide program[4] lists the following program objectives:

- To institute a structural change in the affordable housing industry by reducing regulatory barriers to energy-efficiency
- To provide Long Term Annual Savings of both gas and electricity by promoting installation of efficiency products with long life.
- To provide services to an underserved market – no other programs are taking energy efficiency information and assistance to housing authorities to address the needs of the existing affordable housing market.
- To promote energy savings in a market segment that needs it the most, the low-income sector
- To reduce the high first cost of measures through financial incentives
- To increase owner-developers' knowledge of efficiency measures by providing design assistance and training
- To reduce the lack of information barrier. We will provide a portion of the cost of obtaining a Home Energy Rating (HERS) analysis to identify cost-effective improvements to the subject property.
- To reinforce existing outreach and marketing.
- To create a synthesis with existing programs (such as HERS) for residential energy efficiency improvements, to minimize program costs or duplications.
- To build upon ongoing successes; guiding property owners to take advantage of other programs (e.g., appliance rebate programs).

[4] Heschong Mahone Group Inc., *Designed for Comfort, Efficient Affordable Housing (DfC EAH) State-wide: Proposal for a Local Government Residential Program to Assist Housing Authorities and the Existing Affordable Housing Building Stock in all Service Territories*, p. 9.

The EEBUA report that the EAH program prepared for the Housing Authority of the County of Contra Costa says that the "program seeks to achieve a transformation in the way public housing authorities establish and administer the utility allowance schedule."[5]

Key members of the program staff were also asked the question "What do you think the overall goals of the Designed for Comfort Program are? Their responses included:

- "To change the metrics at housing authorities so that energy efficiency has a natural economic advantage since it currently has an economic disadvantage"
- "To get enough KBTu in terms of therms and kWh to show that the program's dollars spent are justified"
- "To promote energy efficiency in affordable housing and make the point that energy efficiency adds to the affordability of these homes -- both multi-family and single-family."
- "To get ten housing authorities to adopt policies for long-term and ongoing energy savings."
- "To encourage affordable housing owners and developers to invest in energy efficiency and get a faster payback for their investment."
- "To solicit some case study projects to prove to the housing authorities that the policy is effective and easy to implement."
- To work with volunteer rehab organizations to develop that market and with qualified single-family homeowners to install equipment."

These program objectives include both market transformation goals – goals to achieve long-term, sustainable changes in the practices of affordable housing market actors – as well as resource acquisition goals dealing with the purchase of kWh and therm savings. In terms of relative priority, the staff interviews indicated that the market transformation goals were the more important ones. After all, the main tool of the program -- the Energy Efficiency-Based Utility Allowance (EEBUA) – is designed to change the basic economic equation for energy efficiency in the affordable housing market.

However, there was also a general acknowledgement by the staff that financial incentives were needed to "prime the pump." Such incentives could attract the attention and participation of affordable housing owners/developers and their PHAs who might not otherwise take the time to become familiar with the EEBUA concept. Once the developers and PHAs had become comfortable with what is involved in adopting the EEBUA and implementing energy-efficiency projects, then the financial incentives could be phased out. From that point on, economic incentives inherent in the EEBUA, as well as the benefits of energy efficiency, would theoretically drive implementation.

Once the financial incentives were added to the EAH program toolbox, then the resource acquisition goals became relevant as a way "to show that the program's dollars spent are justified," as one member of the program staff described it. The achievement of these resource acquisition goals will also allow the program to provide some short-term payoffs while waiting for the adoption and implementation of the EEBUAs to bear fruit.

[5] Heschong Mahone Group Inc., *An Energy Efficiency-Based Utility Allowance Schedule: Encouraging Energy Efficient Affordable Housing Construction and Retrofits in Contra Costa County*, August 5, 2004, p. 1.

c. Market Actors, Market Barriers, and Program Strategies

This section will provide a description of the program theory as revealed by the staff interviews as well as a review of the program documents. It will briefly describe the key market actors that the EAH program is seeking to influence in order to promote energy efficiency in affordable housing. It will also summarize various barriers that hinder these actors from carrying out necessary program objectives. Finally this section will discuss the program strategies designed to mitigate or surmount these barriers.

d. The Public Housing Authorities (PHAs)

The first critical step in the implementation of the EAH program is convincing Public Housing Authorities (PHAs) to adopt the Energy Efficiency-Based Utility Allowance (EEBUA). Interviews with program staff and a review of the program literature revealed that there are a number of significant barriers to accomplishing this. Table 1-1 summarizes these barriers as well as the program strategies being used to try to overcome these barriers.

Table 1-1
Barriers and Program Strategies
for Public Housing Authorities

Barriers to Implementation	Program Strategy
1. PHAs are too busy to even become familiar with the EEBUA concept	o Offering financial incentives that can be used to finance energy efficient (EE) projects in PHA's jurisdiction. o Enlisting developers in PHA's jurisdiction to lobby for EEBUA o Enlisting public housing trade associations and county housing authorities to endorse EEBUA
2. Many key PHA decision makers are unfamiliar with their own Utility Allowances (UAs) let alone EEBUAs. Many members of the PHA staff are also unfamiliar with the UAs and even the whole concept of energy efficiency.	Providing general education about energy efficiency, utility allowances, and the EEBUA Producing reports showing benefits of EEBUA based on analysis of PHA's existing UA. Providing EEBUA training for PHA staff
3. PHAs don't have staff resources to administer EEBUAs.	Administering EEBUAs on behalf of PHAs.
4. EEBUA approach only works for a certain percentage of the housing within a PHA's jurisdiction.	Pointing out eligible housing and generally managing PHA expectations.
5. Each PHA has its own special needs and sales approaches have to be customized.	o Conducting surveys and networking to learn each PHA's situation

	o Customizing the sales pitches and sales targets appropriately.
6. PHAs who have adopted EEBUAs may fail to actively implement or promote them.	Conducting regular follow-up with PHAs who have adopted EEBUAs in order to track progress and help them to overcome implementation snags.
7. Some PHAs may be hesitant to adopt the EEBUA because HUD has not explicitly sanctioned it.	Promoting HUD newsletter article which identifies EAH project as "best practice"

PHA Barrier #1: PHAs are too busy to even become familiar with the EEBUA concept. One of the program's toughest tasks is simply getting the attention of the PHA so that the educational process can begin. According to one program staff member, "the challenges that we face are bureaucratic inertia and trying to get the housing authorities' attention, first of all, trying to get them interested, and sometimes trying to make them understand"

Program Strategies to Address Barrier #1:

Financial incentives – The program's financial incentives are designed to get the attention of the PHAs, either directly, or indirectly through the lobbying efforts of affordable housing owners/developers who wish to receive these incentives. "If they can't see that the reason to do it is because it's the right thing," one staff member commented, "the housing authority can at least clearly see that 'if I do this, then I will get this influx of $67,000 into the affordable housing arena.'"

Enlisting developers in PHA's jurisdiction to lobby – The current version of the EAH program has put a greater emphasis on using owners/developers of affordable housing to help recruit PHAs for adoption of the EEBUA. "Originally the program was intended to just target the housing authority because that would adopt the EEBUA," said one program staff member, "but we quickly learned that you would have to get developer support." These owner/developers have great influence over the PHAs in whose jurisdiction they operate. "Show us developers that say this is a good idea and then we will consider adopting it," one PHA told an EAH program staffer.

Program staff cited a number of examples where interested developers were able to get previously intransigent PHAs to begin considering adopting the EEBUA. The staff is now trying to formalize these lobbying efforts by getting the developers to write letters to their PHAs. The program has even explored the formation of an owner/developer advocacy group for getting the EEBUAs adopted more widely among the PHAs.

Enlisting public housing trade associations and county housing authorities to promote the EEBUA. The program has found that organizations like the Nonprofit Housing Association of Northern California have been helpful in encouraging PHAs such as the San Francisco Housing Authority to embrace the EEBUA concept.

PHA Barrier #2: Many key PHA decision makers and their staff are unfamiliar with their own Utility Allowances and energy efficiency let alone EEBUAs. Even when a PHA agrees to sit down with the EAH program staff to discuss the EEBUA, adoption is often hindered by the fact that the key decision maker does not understand its benefits. One EAH program staffperson claimed that most PHA staffers

were also unfamiliar with their utility allowances and some were not even familiar with the concept of energy efficiency.

Program Strategies to Address Barrier #2:

Providing general education about energy efficiency, utility allowances, and the EEBUA. "We need to get back to the basics and explain what energy efficiency is before we can get into what an energy-efficiency-based utility allowance can do, " said one EAH program staffperson.

Producing reports showing benefits of EEBUA based on analysis of PHA's existing UA. The EAH program staff produces customized analyses of the UAs of interested PHAs to show exactly how the EEBUAs will benefit them.

Providing EEBUA training for PHA staff. The EAH program seeks to make the PHAs as self-sufficient as possible in administering the EEBUA. Therefore they train members of the staff – often those who are already administering the conventional utility allowance.

PHA Barrier #3: PHAs don't have staff resources to administer EEBUAs. Sometimes the PHAs, especially the smaller ones, simply do not have staff resources available to administer the EEBUA.

Program Strategies to Address Barrier #3:

Administering EEBUAs on behalf of PHAs. One new feature of the 2003-2004 EAH program is it can offer to administer the EEBUA on the PHA's behalf for a two-year period. The EAH program will also conduct training of the PHA staff to insure that

PHA Barrier #4: The EEBUA approach only works for a certain percentage of the housing within a PHA's jurisdiction. The EEBUA is not a silver bullet for the affordable housing market. There are many types of affordable housing that either cannot benefit from the EEBUA or where benefits would be very minimal. These include public housing, housing in which a "maximum allowable rent" is calculated based on an area housing burden, very small affordable housing structures that use Section 8 vouchers, and housing where tenants pay for their own utilities. Since most of these housing types would not qualify for EAH program subsidies, PHAs that have a lot of these types of housing would not find much benefit from the program. Although most California PHAs do have some housing units that are EEBUA-eligible, the fact that the EEBUA only benefits a portion of their housing stock may make the EAH program less attractive.

Program Strategies to Address Barrier #4:

Pointing out eligible housing and managing expectations: The EAH program staff has found that educating PHAs as to what types of housing can benefit from the EEBUA is important for managing the PHA's expectations. PHAs often ask whether the EEBUA will benefit their public housing units. "Every time I go to a housing authority and get that question," an EAH program staffer said, "I tell them 'you know, this is another tool in your arsenal but it may not solve all of your problems.'" Program staffers may also alert the PHA to the possibility that housing units currently ineligible for the EEBUA may become eligible. This might be done, for example, by the adoption of a Utility Allowance for this housing as part of the PHA's periodic restructuring of its contracts with HUD.

PHA Barrier #5: Each PHA has its own special needs and sales approaches have to be customized. One of the most significant barriers to EAH program implementation is the fact that the PHAs vary a lot as to their organizational structures and the makeup of their housing. "We have probably found twelve unique iterations of the public housing authority structure," a program staffer remarked. The staffer elaborated on the difficulties that result from this diversity:

> *We have found that every single housing authority is different. In some cases we have to pull in a whole lot of developers to say 'this is the right thing.' In other cases we don't need the developers to say anything. In some cases we need to bring in the elected officials to tell the housing authority 'this is the right thing.' In other cases if you talk to elected officials you annoy the housing authority staff so much that you are not going to get past phase one. So we have to approach each situation carefully enough that we understand the lay of the land before we get people entrenched in their positions. And we decide on a case-by-case basis who the market actors are that we need to bring into the conversation. Sometimes it's the local association that represents the affordable housing developers. Sometimes it's the utility. It really depends who it is that's going to make the difference.*

Program Strategies to Address Barrier #5:

Conducting surveys and networking to learn each PHA's situation – The EAH program has conducted a survey of California PHAs to find out more about their organizational structures and the makeup of their housing. Networking with PHA staff at trade association meetings and affordable housing conferences have also helped the EAH staff better understand the different PHAs.

Customizing the sales pitches and sales targets – Taking the wrong sales approach, as discussed above, can fail to bring PHAs on board or even alienate them. Therefore the EAH program has tried to customize its methods of persuasion to suit the unique needs of each PHA. Of course such a tailored approach is expensive and time consuming. But it is unclear whether the program staff has any alternative. "We can't write a guidebook that says 'Here's how you deal with a public housing authority'," one program staffer noted, "because there is no one entity called a public housing authority. They are all different."

PHA Barrier #6: PHAs who have adopted EEBUAs may fail to actively implement or promote them. There is some evidence that at least one of the PHAs who adopted the EEBUA before 2004 has yet to complete any projects using the EEBUA.

Program Strategies to Address Barrier #6:

Conducting regular follow-up with PHAs who have adopted EEBUAs in order to track progress and help them to overcome implementation snags. The 2004-2005 version of the EAH program has a "Quality Assurance" component. Six months after the EEBUA training the EAH staff will review how the PHA is using the EEBUA materials. One year after the training the EAH staff will check on how implementation of the EEBUA has been going.

PHA Barrier #7: Some PHAs may be hesitant to adopt the EEBUA because HUD has not explicitly sanctioned it. Despite much effort by the EAH program, HUD has never formally recognized the EEBUA as an acceptable alternative to the standard utility allowance. This has given some PHAs pause

about adopting it. For example, an EAH staffperson quoted one PHA manager as saying "well HUD regulations don't say you should do it this way and therefore I wont."

Program Strategies to Address Barrier #7:

Promoting a HUD article which identifies EAH project as "best practice." Although HUD has never formally **recognized** the EEBUA as an alternative to the standard utility allowance, in Spring 2004 one of HUD's newsletters did feature an EAH program participant – the Riverside PHA – in an article on "best practices." The EAH program staff has been able to promote this article as a *de facto* HUD sanction of the EEBUA concept. "This HUD newsletter has helped tremendously," said one member of the program staff.

The Affordable Housing Owners/Developers

The owners/developers of multifamily affordable housing are as important as the PHAs in insuring the success of the EAH program. They will be the main beneficiaries of the EEBUA and will be the ones who actually implement the energy efficiency projects. The owner/developers will also receive a major share of the financial incentives given out by the program. Table 1-2 summarizes the barriers to implementation of energy efficient projects for this group. It also shows the EAH program strategies being used to try to overcome these barriers.

Table 1-2
Barriers and Program Strategies
for Affordable Housing Owners/ Developers

Barriers to Implementation	Program Strategy
1. Developers of affordable housing do not have the economic incentive to build more EE units when only conventional UAs are in effect in their PHAs	Getting EEBUAs adopted so that developers will have the incentive to build EE units
2. Owners of affordable housing do not have the economic incentive to upgrade existing units for better energy efficiency when only conventional UAs are in effect in their PHAs	Getting EEBUAs adopted to give owners incentives to upgrade units for better energy efficiency
3. Owners/developers of affordable housing lack capital for EE upgrades.	Providing financial incentives and design assistance for owner developers as well as incentives for the use of energy consultants and HERS raters
4. Owner/developers of affordable housing are too busy to get involved with the program or even to become familiar with EEBUA concept	o Explaining to owner/developers the availability of financial incentives and design assistance as well as the economic benefits of the EEBUA. o Providing the owner/developers with a lot of "handholding" to guide them through the program requirements and procedures.
5. Owner/developers of affordable housing have had bad experiences with paperwork burden from past energy efficiency programs and think EAH program will require a lot of their time.	Explaining to owner/developers how EAH program is different than other EE programs they have dealt with in the past

Owner/Developer Barriers #1 and #2: Affordable housing owner/developers do not have the economic incentives to build energy-efficient multifamily housing or upgrade the efficiency of existing housing. As long as the PHA where their housing is located is on a standard utility allowance, there is no economic incentive for these owner/developers to invest in energy efficiency.

Program Strategies to Address Barriers #1 and #2:

Getting their PHAs to adopt the EEBUA. As the proposal for the 2004-2005 EAH program states, "with an energy efficient utility allowance schedule on the books, the benefits of more efficient buildings to the owner-developer become very clear on their bottom line."

Owner Developer Barrier #3: Owners/developers of affordable housing lack capital for upgrades. The proposal for the 2004-2005 EAH program notes that funding for affordable housing projects may come from as many a dozen different projects. "Though there is a strong desire to do the "right" thing, [owner/developers] are constrained by their financing requirements on how their revenues and reserve funds can be spent," the proposal says. "This hinders the usefulness of [EEBUAs] because they do not have the up-front cash to implement the upgrades."

Program Strategies to Address Barrier #3:

Providing financial incentives and design assistance for owners/developers as well as incentives for the use of energy consultants and HERS raters. These incentives and this design assistance are only available to owners/developers for projects that are located within the jurisdiction of a PHA that has either adopted the EEBUA or has committed to do so.

Owner Developer Barrier #4: Owner/developers of affordable housing are too busy to get involved with the program or even to become familiar with EEBUA concept. "It is hard to get even five minutes of a developer's time" one EAH program staffer noted.

Program Strategies to Address Barrier #4:

Explaining to owner/developers the availability of financial incentives and design assistance. The financial incentives and the design assistance are important ways for the EAH program to attract the attention of the owner/developers. "The affordable housing owners and developers are very interested in the incentives," said one member of the EAH program staff. Once the program gets the attention of the owners/developers in this way, it can then explain to them the longer-term economic benefits available through the EEBUA.

Providing "handholding" to the owner/developers. "We literally hold their hand from start to finish," an EAH program staffer said about some of the owner/developers who are interested in the EEBUA concept. "You always have to follow up -- make sure that they are on the right track and timeframe -- because they don't take it upon themselves ... typically you have to provide a fairly high level of service to them."

Owner/Developer Barrier #5: Owner/developers of affordable housing have had bad experiences with paperwork burden from past energy efficiency programs. "Developers are very afraid of getting committed to something that takes a whole lot of effort," one EAH program staffperson noted. "Many of the developers have participated in utility rebate programs in the past and have been seriously burned." A common concern is that the staff time spent filling out the paperwork will exceed the value of the rebates.

Program Strategies to Address Barrier #5:

Explaining to owner/developers how EAH program is different than other EE programs. "We go out of our way to make sure that they know this is something different, that it is not a low-income housing program, that it is not an audit program," one member of the program staff remarked.

The Volunteer Rehab Organizations

The key actors in the single-family component of the EAH program are volunteer rehab organizations such as Rebuilding Together and Habitat for Humanity. These organizations solicit applications from low-income homeowners who seek to receive rehabilitation services. The organizations conduct site inspections of qualifying homes to identify cost-effective opportunities for repair work and to evaluate HVAC systems. Table 1-3 list major barriers to greater energy efficiency in the affordable single-family home sector as well as EAH program strategies for overcoming these barriers.

Table 1-3
Barriers and Program Strategies
for Volunteer Rehab Organizations

Barriers to Implementation	Program Strategy
1. Volunteer rehab organizations lack expertise in the identification of EE opportunities	Providing volunteer rehab organizations with EE inspection and upgrade training
2. The low-income homeowners who work with the volunteer rehab organizations cannot afford more energy efficient equipment	Providing financial incentives for EE equipment upgrades
3. Volunteer rehab organizations do most of their work in the winter and spring.	Timing program marketing and incentive offers to coincide with these activity cycles.

The first two sets of barriers and program strategies are fairly straightforward. The EAH program will train members of the volunteer rehab organizations to identify opportunities for energy efficiency in single-family houses. The program will also provide financial incentives to reduce the incremental cost of energy-efficient HVAC equipment for qualifying single-family homeowners.

The third barrier requires some explanation. Many of the volunteer rehab organizations do most of their work in the winter or springtime. Therefore they do not even finalize their list of projects until the late Fall. "There are some Rebuilding Together organizations that we have met with and they said 'we want the money but wait until November," noted one EAH program staffer. This has forced the EAH program to time its project identification efforts and incentive offers to synchronize with these activity cycles.

Another barrier to participation by the volunteer rehab organizations is the small scale of the EAH program. For example, one program staffer pointed out that the program's goal is to pay only seven rebates to volunteer rehab organizations in the whole SDG&E service territory. This small a payout makes it difficult to recruit rehab organizations in the San Diego area.

3. Summary of Program Metrics

Program metrics are necessary for tracking the progress and ultimate success of the EAH program in carrying out its program strategies. The proposal for the 2004-2005 EAH program identified a number of "goals and milestones." In September 2004 the EAH program staff informed the evaluators that these goal and milestones are the only program metrics and have not changed since the start of the program in January 2004. The proposal describes these goals and milestones in great detail including breakouts by utility service territory and the percentage of the goal that is scheduled to be achieved by a certain date. It is not necessary to reproduce all these tables here. However, the following two tables provide a summary of the program metrics as well as key dates.

Table 1-4
Summary of Program Metrics

Public Housing Authorities (PHAs)
Attendance at 10 affordable housing conferences
Utility Allowance assistance provided to 10 PHAs
Distribution of 1,000 energy efficient kitboxes
5 premium implementation services provided to PHAs
5 articles published on the EEBUA
Large Affordable Housing Owners/Developers
1,000 large multifamily owner incentives
1,000 large multifamily HERS rater incentives
1,500 large multifamily HERS rater incentives
10 tenant energy efficiency trainings
Distribution of 300 energy efficient kitboxes
Small Affordable Housing Owners
150 small multi-family homeowner incentives
200 small multifamily HERS rater incentives
Volunteer Rehab Organizations
5 volunteer rehab organization staff trainings
50 rehab rebates

Table 1-5
Timeline for Key Program Activities

Program Activity	Date
Program applications printed	February 1, 2004
Curricula for PHA implementation training	March 1, 2004
Begin PHA training	March 10, 2004
Program brochures printed	March 31, 2004
EnergySmart Paks (kitboxes) purchased	April 18, 2004
Complete research on UA articles	May 1, 2004
Complete curricula for MF training	May 10, 2004
Complete curricula for volunteer rehab organization training	June 1, 2004
Begin volunteer rehab organization training	July 15, 2004
First Year-End Report	January 30, 2005
Final Report	March 31, 2006

In addition to these metrics there are also program goals for energy savings. However, since this memorandum is focusing on process issues, these will not be summarized here.

4. Program Performance

This section provides a brief summary of the EAH program's performance to date (mid- September 2004) based on staff interviews as well as a review of program documents.

Recruitment of Public Housing Authorities (PHAs)

Achievements

The EAH program has reported significant progress in recruiting three PHAs to adopt the Energy Efficiency-Based Utility Allowance (EEBUA). These include the San Diego County Housing Authority, the San Francisco Housing Authority, and the Long Beach Department of Community Development. The program expects to have all three on board by the Fall 2004.

The program has engaged in serious recruitment efforts with a number of other PHAs. These include:
- Contra Costa Housing Authority

- Fresno Housing Authorities,
- Monterey County PHA,
- Oceanside PHA,
- Placer County Housing Authority,
- Stanislaus County PHA, and
- Yolo County Housing Authority

For most of these PHAs the EAH program has produced EEBUA Reports that compare the PHA's existing utility allowance with the EEBUA. Fresno has expressed an intention to adopt the EEBUA by the end of 2004.

Challenges

Although program staff has been encouraged by recent progress in recruitment, they are well aware of the difficulty of their task. The barriers to implementation discussed earlier in this memorandum are ever-present. "There is a lag time in getting a policy adopted," one staff commented. "It's not something that you can typically present and it goes to their board the next month. They have so many other issues such as their Section 8 funding being jeopardized and as a result things like [the EEBUA] seem important but a bit of a luxury item." As a result of these difficulties, the program recruitments efforts are behind schedule. The first program milestone was to recruit three PHAs by June 9, 2004 and the program has yet to have one adoption – although San Diego, San Francisco, and Long Beach are certainly very close. The next milestone is to recruit five PHAs by December 6, 2004.

Recruitment of Affordable Housing Owners/Developers

Achievements

The EAH program has recently initiated a campaign to recruit projects from owners/developers in the San Diego, San Francisco, and Long Beach areas – where PHAs are close to adopting the EEBUA. It has also enlisted owners/developers in other jurisdictions to try to recruit their PHAs to adopt the EEBUA. For example, the program is working with the developer South County Housing to try to persuade the Monterrey County Housing Authority to adopt. Another developer – Citizen's Housing – is soliciting EEBUA support from three different PHAs where its housing units are located. At the June 2004 California Council for Affordable Housing Conference the program reported that "numerous developers pledged to contact their housing authorities and follow up with letters of support for adoption of an EEBUA."

Challenges

The EAH program staff says it is currently focusing more of its energy on recruiting PHAs than owner/developers. "It has not been a full-swing thing in terms of getting the developer projects," one staffer acknowledged. "But that's because we wanted to target housing authorities first." In addition, many of the developers recruited so far have required a lot of education and guidance. "We literally hold [the developer's] hand from start to finish," one staffmember commented. "Typically you have to provide a fairly high level of service to them."

Recruitment of Volunteer Rehab Organizations

Achievements

The EAH program staff has met with four volunteer rehab organizations in the Northern California area including Rebuilding Together of Oakland, Peninsula, and San Francisco and GRID Alternatives. It has also conducted an email campaign to recruit other volunteer rehab organizations.

Challenges

As discussed in the Program Theory section, volunteer rehab organizations tend to do most of their work in the winter and springtime and do not finalize their list of projects until around November. Therefore the EAH program has to wait until this process is finished before it can begin identifying projects that would qualify for the rebates. The program staff also expressed disappointment in the results of the email marketing campaign, which only received a couple of responses. The failure of the campaign was attributed to the "spam fatigue" experienced by email recipients as well as the need to get better contact names. Finally the staff noted that the small number of volunteer rehab rebates available – 50 for the whole state of California – makes it difficult to recruit participants.

Marketing Materials and Website

Achievements

1. Printed Materials and Kitboxes

The program has produced a wide-range of materials to help the program staff market the program. These include:

- A glossy folder with a general description of the program rules and benefits. The folder includes a pocket to hold the one-page inserts as well as business cards for the program staff.
- Glossy one-page, two-sided inserts that provide more tailored descriptions of program eligibility rules and benefits for each of the major actors targeted by the program. A few of the inserts also include case studies.
- Kitboxes – also called EnergySmart Self-Install Paks – which are white cardboard boxes that contain the following items:
    - An EnergyWise™ Home Energy Savings Guide booklet with program contact information on the back,
    - An energy-efficient showerhead,
    - A faucet aerator,
    - Two compact fluorescent lamps (23W and 14 W),
    - A tablet for detecting leaks in toilet tanks, and
    - A business-card-sized refrigerator magnet with program contact information as well as a strip on the bottom that can detect the temperature.
- Promotional posters tailored for the key market actors with brief bullet points on program benefits, incentives, eligibility rules, and case studies or illustrative examples.
- Program application forms.

The program staff interviews revealed that the staff is generally happy with how these marketing materials have turned out. The kitboxes have been especially popular and the program has recently ordered a new batch for distribution. The program staff has also touted the modularity of the glossy folder and inserts. Because the folder contains generic program information and only the inserts contain more specific information, brochures can be customized for a particular market. In addition, if program details change, generally only the inserts have to be updated. The program has also saved on printing costs by producing the program applications in-house.

2. The Program Website

The program staff also updated the EAH program website to reflect the new 2004-2005 program rules and to make sure the information on the website is consistent with information in the printed materials. In theory, program applications are available on the website for download in Adobe pdf format although the link to the application forms was not available when the evaluation staff tried it in September 2004. Originally the program had considered an on-line application capability for the website, but it was decided that there was not enough traffic on the website to justify the effort. The website also allows program reports and fact sheets to be downloaded, but only if the requester first provides contact information to the program. Users of the website who provide this information are allowed to indicate whether or not they want to be contacted by the program. Finally the website provides program contact information and links to useful websites.

The program website is listed on the printed program marketing materials as well as on the business cards of the program staff. One program staffer indicated that the website was useful as a way to quickly provide potential participants with basic program information. “If we are in a rush or in the middle of a conference we can say ‘check out the website.’”

Challenges

As noted, the program staff was generally pleased with the printed marketing materials and the kitboxes. However, there was a general acknowledgement that the program website was under-utilized. One staffer reported that the website had only received a handful of emails.

Marketing Activities

Achievements

The program staff universally identified their appearance at the May 2004 *Housing California* conference as the most effective of their marketing activities to-date. This is the nation’s largest annual conference on housing and homelessness with over 1,400 attendees. The program not only gave a presentation at one of the conference sessions but also distributed 110 kitboxes. Recipients of the kitboxes were required to listen to a description of the program. The program reported similar success at the June 2004 *California Affordable Housing Council* Conference where 64 kitboxes were distributed. At this conference the program also received commitments from numerous affordable housing developers to recruit their PHAs for EEBUA adoption.

The program has submitted articles on the EEBUA concept to a number of housing newsletters including those published by the Local Government Commission, the California Association of Building Energy Consultants (CABEC), and the Non-Profit Housing Association (NPHA) of Northern California. The program has also placed ads in other housing periodicals.

In addition to these broad marketing efforts, the program has had one-on-one meetings with a number of organizations such as CABEC and NPHA. These entities are not potential program participants but rather program allies that could help spread the program message to PHAs.

Challenges

One big challenge to the PHA's marketing efforts is simply the size of California -- with over 100 PHAs to reach and a large geographical area to cover. "I think there are some challenges associated with trying to manage a statewide program and be everywhere at the same time," one staffer remarked. One way the program has tried to increase its range is to train the junior staff so that they can meet with the PHAs on their own. The *Housing California* conference and the *California Affordable Housing Council* conference allow the EAH program to reach many target program actors at once. However, there are a limited number of such conferences in California in a given year. "If there were more conferences or charettes or seminars that actually brought this housing group together – at least in terms of the marketing, it would be easier," commented one staffer.

Members of the program staff were also asked about other marketing activities that the program could be doing that were within the scope of the program budget. One idea was to more formally organize the affordable housing owner/developer efforts to lobby the PHAs to adopt the EEBUAs. Up until now these lobbying efforts have done on an *ad hoc* basis but there is perceived value in forming these owners/builders into an organized advocacy group. Another idea was to write articles that would not necessarily describe the EAH program but rather would deal more generally with "the nexus between economics, affordable housing, and energy efficiency." These articles would be published in the trade magazines that the owners/developers of affordable housing typically read.

Program Incentives and Tools

Achievements

As noted, the 2004-2005 program has made some changes from past EAH programs in the types and levels of financial incentives available. These changes include:

- Financial incentives for HERS raters and Energy Consultants,
- Caps on the amount of incentive money that can be distributed to a given Public Housing Authority (PHA), and
- Different incentive levels for small and large projects.

The per-PHA incentive cap was not part of the original 2004-2005 proposal but something that the program has recently requested in a change order. The EAH program has successfully changed its website and all its printed materials to reflect these new incentives and incentive levels.

The program staff was asked whether it thought that current levels of program financial incentives are adequate to encourage key market actors to implement energy efficiency measures. There was general consensus that the per-unit incentive levels should be sufficient. However, there were some concerns

about the effects of the per-PHA incentive cap and the HERS rater incentive levels that are discussed in the next subsection. The staff was generally pleased with how the current incentives were structured.

The program has also created EEBUA calculation tools for each of the PHAs that are seriously considering adopting the EEBUA. These calculation tools are set up in a user-friendly Microsoft Excel format and allow the PHA to calculate their EEBUA schedule using inputs from the standard utility allowance schedule.

Challenges

One staffmember thought that the incentive cap was somewhat of a barrier because "many of these housing projects are well over a hundred units and it would be nice to fully fund a 100-150 unit project." However, the staffer conceded that the per-PHA cap was "programmatically necessary." A related concern -- mentioned in the program's June 2004 report – is that the incentive cap might deter some affordable housing owners from participating. "This [cap] directly conflicts with statements we have previously communicated to some housing owners, 'no project caps,'" says the June report. To mitigate this problem the program has proposed giving housing authorities that adopt an EEBUA "a minimum guarantee of incentive funds."

There was also some concern whether the incentive for the HERS rating would be sufficient. These incentives levels were based on HERS ratings for new construction which might be insufficient for retrofit projects which require two trips (pre- and post-implementation) by the HERS rater. One possible solution would be to shift some of the per-unit incentives to the HERS rater. However, since no incentives have even been paid out yet, it is likely premature to prescribe remedies for a problem that may not materialize.

The program staff was also asked whether there were other types of useful financial incentives that the program was not currently offering but could offer within the scope of the program budget. One staffmember suggested incentives for lighting and appliances.

Staff Structure, Coordination and Communications

Achievements

The staff seemed generally pleased with the current staffing structure. There are no formal divisions of labor but some specialization has evolved over time. For example, some staffmembers spend most of their time talking to PHAs while others allocate more of their attention to owners/developers. Some do most of the marketing while others do most of the reporting. There is a program manager who has more authority than other staffmembers and who is responsible for meeting program goals as well as complying with California program management and reporting requirements. However, communication between the program manager and the rest of the staff appears unconstrained by any hierarchical barriers.

There are scheduled bi-weekly meetings that involve not only the EAH program staff, but also staff from other multifamily programs that the Heschong Mahone Group is involved in. These meetings have a dual purpose. First they serve as forums to share lessons learned, test new ideas, and seek solutions to problems encountered in the field. Second they help coordinate actions in the field to minimize duplication of labor and to insure that key assignments are not missed due to unclear areas of

responsibility. Within the EAH program itself there are also many *ad hoc* meetings between program staffmembers to share experiences, seek solutions to problems, and coordinate activities. Finally EAH program staffmembers communicate among themselves frequently via telephone, email, and the entry of information into the tracking databases.

Challenges

As noted, the EAH program staff was generally pleased with the current staff structure, coordination of activities, and lines of communication. There was some mention of staff coordination difficulties at the very start of the program, but the bi-weekly meetings have appeared to solve these problems.

Program Reporting Requirements

Achievements

The Heschong Mahone Group has developed an in-house system that allows its employees to transfer data from their Quickbook reports to a platform Excel spreadsheet and in turn to the program reporting workbooks required by the CPUC. This system saves some data entry time. However, frequent changes to the required workbooks have reduced the efficiency of this system, as discussed in the next subsection.

Challenges

The EAH program staff expressed a high level of frustration with the amount of time and work involved in complying with the program reporting requirements. The required monthly reports and worksheets are very lengthy and separate ones must be submitted for each utility. Another problem is that the format of the required monthly reporting workbooks keeps changing and every revision forces the EAH program staff to have to reestablish links between the platform spreadsheet and the new reporting workbook. There have also been difficulties communicating with the website where the new program reporting workbooks are uploaded. The program staff noted that all the unnecessary time spent meeting these reporting requirements is time they could be spending in the field to implement the program. One program staffer suggested quarterly reports as a less onerous way to keep the utilities and the CPUC informed of the program's progress.