STATE OF SOUTH CAROLINA

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

South Carolina Electric & Gas Company Annual Update on Demand Side Management Programs and Petition for an Update to Rate Rider

COVER SHEET

DOCKET NUMBER: 2012 - 55 - E

(Please type or print)

Submitted by: K. Chad Burgess
SC Bar Number: 69456
Address: SCANA Corp.
220 Operation Way MC C222
Cayce, SC 29033-3701
Telephone: 803-217-8141
Fax: 803-217-7810
Other:
Email: chad.burgess@scana.com

NOTE: The cover sheet and information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. This form is required for use by the Public Service Commission of South Carolina for the purpose of docketing and must be filled out completely.

DOCKETING INFORMATION (Check all that apply)

☐ **Emergency Relief demanded in petition** ☐ **Request for item to be placed on Commission's Agenda expeditiously**

☐ **Other:**

INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Late-Filed Exhibit
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☐ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☒ Report
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatior
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

K. Chad Burgess
Associate General Counsel

chad.burgess@scana.com

May 31, 2012

VIA ELECTRONIC FILING

The Honorable Jocelyn G. Boyd
Chief Clerk/Administrator
Public Service Commission of South Carolina
101 Executive Center Drive
Columbia, South Carolina 29210

RE: South Carolina Electric & Gas Company
Annual Update on Demand Side Management Programs and
Petition for an Update to Rate Rider; Docket No. 2012-55-E

Dear Ms. Boyd:

In its Annual Update on Demand Side Management Programs and Petition for an Update to Rate Rider filed in the above-referenced docket, South Carolina Electric & Gas Company ("SCE&G" or "Company") informed the Public Service Commission of South Carolina ("Commission") that it anticipated completing its Evaluation, Measurement and Verification report ("EM&V Report") in May 2012, and that the EM&V Report would cover the review period of October 1, 2010 to November 30, 2011. In accordance with Commission Order No. 2012-300, SCE&G hereby files with the Commission the Company's EM&V Report.

By copy of this letter, we are also providing a copy of the EM&V Report to the South Carolina Office of Regulatory Staff and enclosed a certificate of service to that effect. We are also providing counsel for the Southern Alliance for Clean Energy and the South Carolina Coastal Conservation League with a courtesy copy of the report.

(Continued . . .)

If you have any questions, please advise.

Very truly yours,

K. Chad Burgess

KCB/kms
Enclosure

cc: John W. Flitter
Jeffrey M. Nelson, Esquire
J. Blanding Holman, IV, Esquire
(all via electronic mail and U.S. First-Class Mail)

BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 2012-55-E

IN RE:

South Carolina Electric & Gas Company Annual Update on Demand Side Management Programs and Petition for an Update to Rate Rider	)	**CERTIFICATE OF SERVICE**

This is the certify that I have caused to be served this day a copy of South Carolina Electric & Gas Company's **Evaluation, Measurement and Verification Report** to the persons named below via electronic mail and First Class U.S. Mail at the addresses set forth:

Jeffrey M. Nelson, Esquire
Office of Regulatory Staff
1401 Main Street, Suite 900
Columbia, SC 29201
jnelson@regstaff.sc.gov

John Flitter
Office of Regulatory Staff
1401 Main Street, Suite 900
Columbia, SC 29201
jflitter@regstaff.sc.gov

Karen M. Scruggs

Columbia, South Carolina

This 31st day of May 2012

SCE&G ENERGYWISE PROGRAM YEAR 1: MEASUREMENT AND VERIFICATION REPORT

Prepared for:

SOUTH CAROLINA ELECTRIC & GAS COMPANY

Prepared by:

OPINION DYNAMICS CORPORATION
230 Third Avenue
Third Floor
Waltham, MA 02451
(617) 492-1400
www.opiniondynamics.com

Contact: Megan Campbell, Senior Project Manager
May 30, 2012

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

1. EXECUTIVE SUMMARY

South Carolina Electric & Gas Company (SCE&G) began offering customer energy efficiency programs in October 2010. The period from October 2010 through November 2011 constituted their first program year (PY1). Over this period, SCE&G rolled out eight programs for their residential customers, and two programs for their commercial and industrial (C&I) customers (offering prescriptive and custom rebates).[1] Due to the ramp-up period required for these programs, many of the efforts were offered for less than a full year. Based on SCE&G's planning model for this portfolio of programs, it forecasted to achieve net 102,877 MWh and 16.7 MW in PY1. The original forecasts assumed that each program would have 12 full months of implementation time in PY1; however, actual implementation times varied. The forecasts were revised to account for estimated implementation time. Revised forecasts, also known as "phased in forecasts", show that it planned to achieve net 87,949 MWh and 13.66 MW[2] in PY1. The savings claimed by SCE&G over this period fell slightly short of forecast, achieving net 57,332 MWh and 9.87 MW. *We compare the program's performance in PY1 to the revised forecasts throughout this report. Refer to Appendix A for how each program's original forecast changed based on the phased-in approach.*

This document verifies the claimed savings for PY1 (October 2010-November 2011). The purpose of this report is to:

- Verify the actual gross and net program energy and demand savings estimates as compared to the company's forecast (net savings are calculated by applying the planning model NTG ratios for PY1, revised NTG ratios are not suggested at this time due to limited participation in PY1); and
- Verify program participation

The overall net energy and demand savings for PY1 are estimated to be 57,332 MWh and 9.87 MW, which account for 65% and 72% of forecast savings. Overall in PY1, the program spent $11,446,748 dollars implementing this portfolio of programs[3], which was 79% of what was forecasted. In general, first year administrative costs (as a percentage of overall costs) tend to be higher due to the need to build the program infrastructure and program networks (e.g., marketing materials, program databases, applications, training, etc.). In addition, program participation is not generally as high in the first year since there is a ramp up period (and no backlog from prior program efforts). While the program's costs were 79% of forecasts, the energy savings were less than projected overall (65% of forecast). This is as expected since some programs started later than anticipated and did not have the full 12 months of implementation in PY1. For programs like the Home Energy Report, much of the three year cost of the program was incurred in PY1; future years are anticipated to have much lower costs. Further, for the programs that rely heavily on contractor networks, there was a need to invest money into contractor training and marketing in the first year. Generally, these programs do not see the participation benefits from these investments until PY2 or even PY3. However, as shown in the table below, two programs—the ENERGY STAR Lighting and Home Energy Check-up programs—stand out as performing better than anticipated in PY1.

---

[1] Note that SCE&G also offered a pilot Energy Information Display program for small commercial customers. This additional offering is also discussed in this report.

[2] Reflects "phased in" forecasts for each program based on projected implementation time. Excludes forecast for Commercial Energy Information Display program since that program was not part of the original forecast model.

[3] Program costs reported here do not account for amortization or interest. Actual program costs were filed with the Commission, Docket # 2012-55-E

Table 1. Portfolio Net Savings, Program Costs and Participation

	NET Savings				Program Costs		Participation		
Program Name	MWh Actual	% of Forecast	MW Actual	% of Forecast	Cost Actual	% of Forecast	Participation Actual	% of Forecast	Participation Definition
ENERGY STAR Lighting	37,320	204%	4.19	177%	$3,090,535	109%	1,251,340	163%	Bulbs
Home Energy Reports	9,311	150%	3.41	151%	$910,856	193%	28,216	150%	Customers
Heating & Cooling and Water Heating	1,586	30%	0.48	39%	$1,652,192	66%	1,429	35%	Measures
Home Energy Check-up	585	119%	0.14	140%	$407,587	103%	2036	149%	Customers
Energy Information Display	200	16%	0.032	16%	$266,886	46%	500	16%	Customers
ENERGY STAR New Homes	196	116%	0.057	95%	$388,005	142%	86	46%	Homes
Home Performance w ENERGY STAR	79.5	6%	0.023	8%	$736,428	53%	33	6%	Customers
Heating & Cooling Efficiency Improvement	37.6	1%	0.02	2%	$698,356	59%	85	2%	Customers
Commercial and Industrial - Prescriptive & Custom	8,017	15%	1.52	26%	$3,264,069	68%	329	71%	Customers
Commercial and Industrial Energy Information Display	N/A				$31,834			N/A	Customers
Total	**57,332**	**65%**	**9.87**	**72%**	**$ 11,446,748**	**79%**			

* Actuals are compared to phased in forecasts. Original forecasts were revised based on implementation start date

* Program costs presented in this report do not account for amortization or interest (carrying cost)

Notably, the Commercial and Industrial Energy Information Display program was introduced to the portfolio after the initial filing. It was intended to serve as a pilot program in PY1 to see if the residential-focused technology could be a viable option for small business customers. Evaluation efforts were geared toward determining whether small business customers accepted and used the device. Evaluation results proved that this technology was not a good fit for small business customers and will not be pursued moving forward.

As shown in Table 2, most of the first year's energy savings came from lighting sales through the ENERGY STAR Lighting Program. The Home Energy Reports program also contributed a significant amount due to the large number of participants in that program. In addition, the C&I programs were a big contributor to overall savings. The other programs had limited participation in PY1 and are expected to contribute more with increased marketing and implementation time in PY2.

Table 2. Program Contribution to Overall Portfolio Savings

Program	%
ENERGY STAR Lighting	65%
Home Energy Reports	16%
Heating & Cooling and Water Heating	3%
Home Energy Check-up	1%
Energy Information Display	0.3%
ENERGY STAR New Homes	0.3%
Home Performance w ENERGY STAR	0.1%
Heating & Cooling Efficiency Improvement	0.1%
Commercial and Industrial - Prescriptive & Custom	14%

Verification efforts conducted to date for PY1 participants show that some of the tracking databases were overestimating or underestimating the energy and demand savings. This verification effort focuses on reviewing the program's databases, documenting agreed-upon energy and demand savings, and verifying that the program's tracking databases were accurately applying energy and demand savings.

The first year of program implementation is often an iterative process to ensure that all data tracking and savings assumptions will support impact verification and evaluation efforts. As such, throughout this report we note a few places where we were unable to verify the energy savings that the program is claiming in its tracking databases at this time. We also identify a few issues with the program tracking databases and supporting documentation for energy savings. The evaluation team has been working with SCE&G on these issues and SCE&G has made, or is currently in the process of making, revisions to the tracking database as explained in the program write-ups below. As of the submission of the report, many of the issues outlined in the report have been corrected for the next program year.

While additional measure documentation is needed, we are confident that we can work together with SCE&G and its program implementers to ensure that all savings assumptions are well documented in the future. This is standard in the first year of program implementation and we plan to work with SCE&G and the program implementers to ensure that sufficient documentation is available in the next year.

Table 3 shows the realization rates that were found in PY1, and definition of each rate. More details

regarding the realization rates and definitions are found in each program's summary chapter.

Table 3. Portfolio Realization Rates

Program Name	kWh Realization Rate	KW Realization Rate	Realization Rate Definition	Primary Reasons for Difference
ENERGY STAR Lighting	100%	100%	Comparison of deemed energy and demand savings to tracking database	N/A
Home Energy Reports	N/A because database did not track energy savings. Verification applied the assumed values per measure by participation.			
Heating & Cooling and Water Heating	251%	252%	HVAC equipment: Comparison of deemed energy and demand savings to tracking database	Did not apply savings to some units
	110%	110%	Water heating equipment: Comparison of deemed energy and demand savings to tracking database	Savings not applied to gas storage water heaters
Home Energy Check-up	68%	70%	% of measures given to customers that were installed	Database assumes all measures were installed, phone verification calculated actual installation rate
Energy Information Display	N/A: Database did not track energy savings. Applied the assumed values per measure by participation.			
ENERGY STAR New Homes	N/A: Evaluation modeling is not planned to occur until PY3.			
Home Performance w ENERGY STAR	N/A: Billing analysis is not planned to occur until PY3.			
Heating & Cooling Efficiency Improvement	100%	100%	Comparison of deemed energy and demand savings to tracking database	N/A
Commercial and Industrial - Prescriptive & Custom	95%	100%	Comparison of deemed energy and demand savings to tracking database	In select cases: lack of documentation to support savings values in the tracking database; adjusted lighting measures for 10 sites based on logger study
Commercial and Industrial Energy Information Display	N/A: Introduced after initial portfolio filing and savings were not forecasted in original filing			

2. EVALUATION METHODS

The purpose of this PY1 verification report is to:

- Verify the actual gross and net program energy and demand savings estimates as compared to the company's forecast (net savings are calculated by applying the planning model NTG ratios for PY1, revised NTG ratios are not suggested at this time due to limited participation in PY1); and
- Verify program participation

Given that this is SCE&G's first year implementing demand-side management (DSM) programs and participation was just ramping up in PY1, this evaluation focuses on reviewing the program's databases, documenting agreed-upon energy and demand savings, and verifying that the program's tracking databases were accurately applying the energy and demand savings that the program used in its planning forecast model. As such, this document reports on the program's tracked energy savings versus its verified energy savings and reports on the realization rate (percent of tracked savings that is verified). Definitions of these two terms are:

- **Tracked savings** reflect the savings reported by the program implementers – both numbers of measures and units installed and the energy and demand savings that were applied per unit in the tracking databases.
- **Verified savings** reflect a review of the tracking savings to ensure that the numbers installed are correct and that the implementer applied the agreed-upon assumptions for energy and demand. The source of the agreed-upon savings is documented in our report. Where no documentation is available, we note that we were not able to verify the savings assumptions. Verified savings also include net-to-gross ratios from the planning assumptions.

As these programs gain market traction and increase participation, future evaluation efforts will focus more on evaluated savings. Evaluated savings will include recommendations for changes to the energy and demand savings to better reflect participant characteristics and unique aspects of the measures that were installed. Evaluated savings will also include findings on attribution (net-to-gross) from survey results, where available. Evaluated savings reflect our research-based findings and professional engineering judgment on what savings actually are occurring as a result of the program.

Table 4 below shows the methods that were applied in this impact evaluation report.

Table 4. PY1 Verification Methods

	C&I Prescriptive	C&I Custom	ENERGY STAR Lighting	Heating & Cooling and Water Heating Equipment	Efficiency Improvement	Home Energy Check-up	Home Performance with ENERGY STAR	ENERGY STAR New Homes	Home Energy Reports	Energy Information Display
Reviewed Data Tracking Systems Against Deemed Savings Assumptions	All Programs									
Phone Survey Measure Verification	Y	N	N	Y	Y	Y (adjusted gross energy savings)[a]	Y	N	N	Y
On-Site Measurement and Verification	Y (adjusted gross energy savings)	N								
Adjustment of gross savings by measure	Adjustments reflect verification of installation and correction of any mis-applied savings estimates from program planning.									
Net-to-Gross Ratio	Applied planning model assumptions for PY1.									

[a] Phone surveys conducted with participants to ensure measures were received and still operating. All measures were verified in the survey; therefore, no adjustments were made with the exception of the Home Energy Check-Up program where the program leaves measures with customers for them to self install. This program's database assumes that all measures are installed, phone surveys calculated the actual installation rate per measure and adjusted the energy savings accordingly. Installation rates met the industry standard of precision, 90% confidence internal +/- 10%.

3. PROGRAM-SPECIFIC FINDINGS

This section provides the program-by-program write-ups. Each section includes a program description, a summary of the program performance, and a detailed assessment of the verification of program impacts. The residential programs are presented first (in order of their energy savings contribution to the overall portfolio), followed by the commercial programs.

3.1 ENERGY STAR Lighting

3.1.1 Program Description

The SCE&G Residential ENERGY STAR® Lighting Program launched in February 2011 with a sole focus on providing upstream price reductions on energy efficient lighting. The objective of the program is to increase market share and the purchase of ENERGY STAR qualified lighting and lighting products through retail sales channels by discounting prices. The program is designed to overcome the most common barriers for upgrading to energy efficient lighting including:

- Higher first cost of energy efficient technologies compared to existing technologies
- Lack of consumer understanding about the benefits, savings, and features associated with energy efficient lighting

Additional barriers addressed by the program are product availability and performance or quality perceptions.

These consumer barriers are addressed through incentives, education, marketing and collaboration with retailers. Specifically informational and educational materials via:

- Point-of-purchase;
- Bill inserts;
- CFL Demonstrations;
- In-store events across the service territory;
- Newspaper advertising;
- Web banner ads;
- Television ads; and,
- Radio ads.

The program is designed to target residential electric customers within SCE&G's service territory, specifically focusing on single-family homeowners, and renters. The program limits sales to a maximum of 15 bulbs per customer.

The incentive levels for the program are set so that products can competitively compete with their inefficient counterpart, such as an incandescent bulb, while providing retail prices that are attractive to customers. During program planning, each bulb type was set with an incentive level, but the program left the range per-unit open to some level of flexibility to provide the incentive amount needed to competitively price the targeted product in store. Incentives are set to cover 25% to 75% of the incremental cost of the measure. Planning incentive levels are summarized in the table below:

Table 5. Planning Incentive by Bulb Type

Measure	Incentive
Standard CFL bulbs	$2.00
Specialty CFL bulbs	$3.00
LED nightlights	$1.00
LED task light bulbs	$1.00
Torchiere Lamps	$10.00

SCE&G partnered directly with retailers and manufacturers to offer incentives at the point of sale. In a majority of cases, incentives were provided via mark-downs directly to the manufacturer and in other cases, incentives are provided via an instant in-store coupon customers fill out at the point of sale. Only those retailers whose sales tracking systems could not accommodate mark-downs are offered the instant in-store coupon. Retailers are recruited at the corporate level and, in the case of franchise or independent retailers, at the store level via APT contracted field representatives. Active participating retailers included Lowe's, Sam's Club, Walmart, The Home Depot, Costco, Dollar General, Walgreens, Ace Hardware, and Batteries Plus – nine retailers in total. One hundred and thirty-nine (139) total store fronts actively participated during the first year of the program.

Participating retailers receive in-store signage or point-of-sale (POS) materials that are designed to catch customers' eyes and provide information on the incentivized price point and the features and benefits of the qualifying product. Featured messages on POS materials include:

- SCE&G's support of the discount and promotion
- Information on the features and benefits of qualified product including long life, lower operating costs, sizes, and colors available.

The program staff also holds in-store events that are designed to provide one-on-one interaction with customers, sharing features and benefits of qualified products and spurring sales. In PY1, the program held 48 events at different locations across the service territory and offered CFL displays at the Columbia Home Builder's Association Tour of Homes and the Columbia Metropolitan Magazine Dream Home event in Lexington.

3.1.2 Program Performance Summary

The SCE&G Lighting program was very successful, exceeding the PY1 participation forecast and accounting for 65% of the total savings from SCE&G's energy efficiency programs. SCE&G forecasted that they would sell 767,688 bulbs through the program in PY1. At the end of the program year, SCE&G provided incentives on 1,251,340 bulbs, reaching 163% of the forecasted number.

Table 6 summarizes the forecasts and overall results for the program in terms of participation and energy and demand savings. Because of the success of the program, SCE&G exceeded the forecast budget allocation for the program, spending 109%. Notably the program exceeded the participant forecast by 163%. The program database includes all requests from retailers between February 2011 and November 2011.

Table 6. PY1 Program Forecasts and Results

	Forecast	Actual	% of Forecast Accomplished
Cost	$2,828,613	$3,090,535	109%
Participants (# lamps sold)	767,688	1,251,340	163%
Net MWH	18,280	37,320	204%
Net MW	2.36	4.19	177%

Participation was most significant at home improvement, deep discount, club, and big box merchants with emerging participation at smaller co-operative and drug and specialty stores. Table 7 below provides a summary of the bulb sales by retailer in the SCE&G service territory in PY1.

Table 7. Sales by Retailer[4]

Retail Type	Retailer	Total Bulbs Sold
Home improvement, deep discount, club, and big box stores	Retailer A	371,462
	Retailer B	301,895
	Retailer C	286,096
	Retailer D	166,814
	Retailer E	93,506
	Retailer F	25,542
Co-operative drug and specialty stores	Retailer G	5,105
	Retailer H	695
	Retailer I	225
	Totals	**1,251,340**

3.1.3 Impact & Data Tracking Findings

After reviewing databases and agreed-upon savings estimates, the net savings for this program are estimated to be 37,319,817 kWh and 4,194 kW. Overall, the program realized 100% of its tracked energy and demand savings. The table below shows the detailed sales by wattage.

[4] Store names are held back in order to keep proprietary sales information confidential

Table 8. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings

Measure Type	Units Sold	Units Returned[5]	Total Units Sold	Verified Units Sold	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
					kWh	kW	kWh	kW	kWh	kW		kWh	kW
CFL - 7 Watt	2,147	11	2,136	2,136	34,180	3.8	34,180	3.8	1.0	1.0	0.7	23,926	2.67
CFL - 9 Watt	21,540	12	21,528	21,528	593,290	66.7	593,290	66.7	1.0	1.0	0.7	415,303	46.7
CFL - 10 Watt	32,190	0	32,190	32,190	858,507	96.6	858,507	96.6	1.0	1.0	0.7	600,955	67.6
CFL - 11 Watt	23,616	15	23,601	23,601	608,457	68.4	608,457	68.4	1.0	1.0	0.7	425,920	47.9
CFL - 12 Watt	3,979	5	3,974	3,974	98,921	11.1	98,921	11.1	1.0	1.0	0.7	69,245	7.8
CFL - 13 Watt	622,778	36	622,742	622,742	26,020,029	2,926.9	26,020,029	2,926.9	1.0	1.0	0.7	18,214,020	2,048.8
CFL - 14 Watt	175,059	284	174,775	174,775	7,147,249	804.0	7,147,249	804.0	1.0	1.0	0.7	5,003,074	562.8
CFL - 15 Watt	43,771	112	43,659	43,659	1,746,578	196.5	1,746,578	196.5	1.0	1.0	0.7	1,222,605	137.5
CFL - 16 Watt	8,055	4	8,051	8,051	314,923	35.4	314,923	35.4	1.0	1.0	0.7	220,446	24.8
CFL - 18 Watt	32,674	24	32,650	32,650	1,654,473	186.1	1,654,473	186.1	1.0	1.0	0.7	1,158,131	130.3
CFL - 19 Watt	9,984	270	9,714	9,714	483,602	54.4	483,602	54.4	1.0	1.0	0.7	338,521	38.1
CFL - 20 Watt	35,415	11	35,404	35,404	1,731,079	194.7	1,731,079	194.7	1.0	1.0	0.7	1,211,755	136.3
CFL - 22 Watt	1,593	0	1,593	1,593	75,057	8.4	75,057	8.4	1.0	1.0	0.7	52,540	5.9
CFL - 23 Watt	190,398	602	189,796	189,796	8,773,889	986.9	8,773,889	986.9	1.0	1.0	0.7	6,141,723	690.0
CFL - 24 Watt	30	1	29	29	1,315	0.2	1,315	0.2	1.0	1.0	0.7	920	0.1
CFL - 26 Watt	40,769	20	40,749	40,749	2,680,714	301.5	2,680,714	301.5	1.0	1.0	0.7	1,876,500	211.0
CFL - 27 Watt	3,665	18	3,647	3,647	236,679	26.6	236,679	26.6	1.0	1.0	0.7	165,676	18.6

[5] Future research will aim to look into the higher return rate for certain wattages when compared to other program wattages.

Measure Type	Units Sold	Units Returned[5]	Total Units Sold	Verified Units Sold	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
					kWh	kW	kWh	kW	kWh	kW		kWh	kW
CFL - 29 Watt	604	0	604	604	38,124	4.5	38,124	4.5	1.0	1.0	0.7	26,687	3.0
CFL - 30 Watt	89	1	88	88	5,476	0.6	5,476	0.6	1.0	1.0	0.7	3,833	0.4
CFL - 32 Watt	710	1	709	709	42,860	4.8	42,860	4.8	1.0	1.0	0.7	30,002	3.4
CFL - 33 Watt	1	1	0	0	0.00	0.0	0.00	0.0	1.0	1.0	0.7	0.00	0.0
CFL - 39 Watt	238	0	238	238	12,907	1.5	12,907	1.5	1.0	1.0	0.7	9,035	1.0
CFL - 40 Watt	619	6	613	613	46,321	5.2	46,321	5.2	1.0	1.0	0.7	32,425	3.7
CFL - 42 Watt	587	0	587	587	56,359	6.3	56,359	6.3	1.0	1.0	0.7	39,451	4.4
LED - 6 Watts	144	0	144	144	2,432	0.3	2,432	0.3	1.0	1.0	0.7	1,703	0.2
LED Nightlight - 0.25 Watts	360	1	359	359	8,845	0.0	8,845	0.0	1.0	1.0	0.7	6,191	0.0
LED Nightlight - 0.5 Watts	1,760	0	1,760	1,760	41,756	0.0	41,756	0.0	1.0	1.0	0.7	29,229	0.0
Total	**1,252,775**	**1,435**	**1,251,340**	**1,251,340**	**53,314,024**	**5,991.4**	**53,314,024**	**5,991.4**	**1.0**	**1.0**	**0.7**	**37,319,817**	**4,194.0**

Table 9. Overview of Verification Analysis for Lighting

Measure	Program Tracked Savings Assumptions		Verified Energy Savings Assumptions		Notes on Differences between Tracked and Verified Savings
	Net Energy (kWh/lamp)	Net Demand (kW/lamp)	Net Energy (kWh/lamp)	Net Demand (kW/lamp)	
CFL - 7 Watt	16.00	0.0018	16.00	0.0018	No changes
CFL - 9 Watt	27.56	0.0031	27.56	0.0031	No changes
CFL - 10 Watt	26.67	0.0030	26.67	0.0030	No changes
CFL - 11 Watt	25.78	0.0029	25.78	0.0029	No changes
CFL - 12 Watt	24.89	0.0028	24.89	0.0028	No changes
CFL - 13 Watt	41.78	0.0047	41.78	0.0047	No changes
CFL - 14 Watt	40.89	0.0046	40.89	0.0046	No changes
CFL - 15 Watt	40.01	0.0045	40.01	0.0045	No changes
CFL - 16 Watt	39.12	0.0044	39.12	0.0044	No changes
CFL - 18 Watt	50.67	0.0057	50.67	0.0057	No changes
CFL - 19 Watt	49.78	0.0056	49.78	0.0056	No changes
CFL - 20 Watt	48.89	0.0055	48.89	0.0055	No changes
CFL - 22 Watt	47.12	0.0053	47.12	0.0053	No changes
CFL - 23 Watt	46.23	0.0052	46.23	0.0052	No changes
CFL - 24 Watt	45.34	0.0051	45.34	0.0051	No changes
CFL - 26 Watt	65.79	0.0074	65.79	0.0074	No changes
CFL - 27 Watt	64.90	0.0073	64.90	0.0073	No changes
CFL - 29 Watt	63.12	0.0071	63.12	0.0071	No changes
CFL - 30 Watt	62.23	0.0070	62.23	0.0070	No changes
CFL - 32 Watt	60.45	0.0068	60.45	0.0068	No changes
CFL - 33 Watt	59.56	0.0067	59.56	0.0067	No changes
CFL - 39 Watt	54.23	0.0061	54.23	0.0061	No changes
CFL - 40 Watt	75.56	0.0085	75.56	0.0085	No changes
CFL - 42 Watt	96.01	0.0108	96.01	0.0108	No changes
LED - 6 Watts	16.89	0.0019	16.89	0.0019	No changes
LED Nightlight - 0.25 Watts	24.64	0.00	24.64	0.00	No changes
LED Nightlight - 0.5 Watts	23.73	0.00	23.73	0.00	No changes

Compact Fluorescent Lighting (CFL)

During PY1, over 1.25 million CFLs were sold, making up over 99% of the overall program's measures. (LEDs account for the remaining measures.) There are no discrepancies found between the tracked savings and the deemed savings provided by SCE&G and developed by ICF.

The tracked database included 208 measures with negative lamp quantities, for a total of 1,435 lamps. These negative sales represent products that were returned to the stores.

The baseline wattages used to calculate savings ranged from 25 to 150W, depending on the wattage of the replacement CFL. Demand savings have been calculated using a coincidence factor of 0.10 as indicated in the deemed savings data as provided by ICF, and energy savings were based on CFLs' operation of 2.44 hours per day. Table 9 provides a comparison of program tracked and verified energy savings by wattage.

Light Emitting Diodes (LED)

Throughout PY1, 2,263 LED products were sold, representing just 0.2% of the program's overall lighting sales. Of these units, only 144 were 6W LED desk lamps, and the remaining 2,199 were LED nightlights.

Program staff provided the evaluation team with the deemed energy and demand values for LED lighting. We found no discrepancies between the tracked savings and the deemed savings provided, so the realization rate for all LED lamps is 1.0. We assume that LED lamps use a coincidence factor of 0.10 and 2.44 daily hours of use.

3.2 Home Energy Reports

3.2.1 Program Description

The Residential Home Energy Report program (HER) offers free monthly reports to customers comparing their energy usage to a peer group and to themselves over time. The reports also provide information to help participants identify, analyze, and act upon energy efficiency upgrade opportunities and energy saving behaviors to reduce their household energy use.

A total of 309,969 customers were solicited early in 2011 to opt-in to the program by completing an initial Home Energy Survey. The Home Energy Survey asked customers details about their home, household appliances and equipment. A total of 28,216 customers enrolled in the program in PY1 by completing the Home Energy Survey. Drawing on the information provided in the survey, an initial Home Energy Report was issued to those who opted-in in April 2011. The Home Energy Reports provided customers with a summary of their household energy use.

After the introduction of the Home Energy Report, subsequent monthly Home Energy Updates were issued to customers comparing their usage to a peer group and promoting a variety of customized energy efficiency tips and information about other SCE&G demand-side management programs. These Home Energy Updates began in June 2011. Just over 60% of participants opted for receiving the online version of the Update, while the remaining participants received a hard copy version by mail. In addition, starting at the end of September 2011, participants could also access the Home Energy Plan, an online tool to assist customers in developing personalized energy efficiency forecasts and a plan.

3.2.2 Program Performance Summary

This program is an important component of SCE&G's portfolio, making up 16% of the energy savings from the programs offered in PY1. Notably, the program savings estimate in this report assumes that the savings per participant are equal to those in the planning forecast. No verification of these savings has occurred to date.

In PY1, the program met and exceeded its participation forecast, with a total of 28,216 participants enrolled in the program. As such, the participation and savings results for the program during PY1 have exceeded the forecasts that were originally set. This is due to a larger number of participants than originally expected.[6] The program also spent more of the forecasted budget than anticipated in PY1. The program recruited its entire 3-year program participants in the first year of the program. For this reason, the first year costs exceed the budgeted amount but are aligned with the 3-year estimates[7]. Table 10 summarizes the forecasts and overall results for the program in terms of participation and the associated deemed energy savings and demand reduction estimated per participant.

[6] Note that this assumes savings based on deemed savings estimates.

[7] The original three-year budget for Residential Benchmarking filed with the Commission was $1,418,597 which also includes year-over-year administration costs.

Table 10. PY1 Program Forecast and Actuals

	Forecast	Actual	% of Forecast Accomplished
Cost	$472,500	$910,856	193%
Participants	18,750	28,216	150%
Net MWH	6,187	9,311	150%
Net MW	2.27	3.41	151%

3.2.3 Impact Findings

For this report, the evaluation team verified that there were 28,216 unique customer records in the tracking database, and then applied the estimated per-participant energy and demand savings specified in the planning assumptions.

After applying the assumed energy and demand savings per participant, the net savings for this program are estimated to be 9,311,280 kWh and 3,414 kW. Table 11 shows the deemed energy and demand savings that were applied to each participant. These numbers were specified in data provided to the evaluation team by SCE&G.

Table 11. Application of Deemed Savings Per Participant

Description	Number of Units	Assumed kWh Savings Per Participant	Assumed KW Savings Per Participant	Gross Savings kWh	Gross Savings kW	PY1 NTGR	Net Savings kWh	Net Savings kW
Forecast Total	18,750	330	0.121	6,187,500	2,268.75	1	6,187,500	2,268.75
Tracked Total	28,216	330	0.121	9,311,280	3,414.14	1	9,311,280	3,414.14
% of forecast	1.50			1.50	1.50		1.50	1.50

To date, the evaluation team has not verified the savings associated with the Home Energy Report. The savings values identified in this report are deemed, and the actual savings associated with the HER program may increase or decrease depending on the actual consumption patterns of the participants. The assumed 330 kWh per person estimate, however, is approximately 2% of the average residential energy consumption[8], which is in line with savings found from opt-in home energy report programs in other areas of the country.[9]

Notably, since this program was not initiated until mid-year 2011, we anticipate that these annual savings would occur over the period from mid-2011 until mid-2012.

[8] Average residential consumption per year estimated at 14,300 kWh based on sales and customer numbers provided in the Testimony of Randy Gunn on behalf of the Office of Regulatory Staff in conjunction with evaluation.

[9] Note that this assumption is not documented in the current SCMDB. Through interaction with the program team, this number is based on findings from a similar program offered in Sacramento, California.

3.3 Residential Heating & Cooling and Water Heating

3.3.1 Program Description

The Residential Heating & Cooling and Water Heating Program offers incentives to residential customers to purchase and install high efficiency HVAC systems and non-electric-resistance water heater systems. The program incents the market for switching from electric-resistance water heaters to several other types of water heaters (natural gas, propane, heat pump water heaters, solar) for both new construction and existing replacement installations. The program's major goals are to assist customers with reducing electric consumption without compromising comfort in the home. The rebates help to offset the upfront cost for purchases of energy-efficient HVAC equipment and non-electric water heaters. To participate in this program, the customer must receive residential electric service from SCE&G in a new or existing separately metered residence. The incentives vary by measure and efficiency level. Table 12 shows the measures eligible under this program with associated incentives.

Table 12. Program Incentives Offered

Eligible Measures	Rebate Amounts
Packaged Central A/C (≥ 14 SEER and ≥ 11 EER)	$200
Packaged Central A/C (≥ 15 SEER and ≥ 12 EER)	$300
Split Central A/C (≥ 14.5 SEER and ≥ 12 EER)	$200
Split Central A/C (≥ 16 SEER and ≥ 12.5 EER)	$300
Packaged Heat Pump (≥ 14 SEER and ≥ 11 EER)	$200
Packaged Heat Pump (≥ 15 SEER and ≥ 12 EER)	$300
Split Heat Pump (≥ 14.5 SEER and ≥ 12 EER)	$200
Split Heat Pump (≥ 16 SEER and ≥ 12.5 EER)	$300
Ground Source Heat Pump (≥ 17 EER and ≥ 4.3 COP)	$375
Ground Source Heat Pump (≥ 19 EER and ≥ 4.6 COP)	$525
Non-electric resistance water heater	$250

3.3.2 Program Performance Summary

Overall, the program accounted for 3% of SCE&G's energy savings. The program, as designed, required contractors to be enrolled as an SCE&G participating contractor before they could participate in the program. In PY1, SCE&G found that many eligible contractors were not participating in the program due to insurance costs required for participation. This requirement limited the number of contractors that participated in the program and thereby the number of customers reached. This was further confirmed by Opinion Dynamics through an email survey of contractors conducted in mid-August 2011. Table 13 summarizes the forecasts and overall results for the program in terms of costs, participation, and energy and demand savings. Due to the upfront time requirements for program design and implementation, the program was launched in March 2011. As such, the PY1 results have fallen short of the forecasts set for the program.

Table 13. PY1 Program Forecasts and Results

	Forecast	Actual	% of Forecast Accomplished
Cost	$2,509,763	$1,652,192	66%
Measures	4,043	1,429	35%
Net MWH	5,255	1,586	30%
Net MW	1.24	0.48	39%

The program had participation from 1,378 residential customers during PY1. Table 14 shows the population size and number of measures installed by equipment type.

Table 14. Population Size

Equipment	Number of Homes	Number of Measures
Total HVAC	1,066	1,114
Water Heating	312	315
TOTAL Customers	**1,378**	**1,429**

The majority of the HVAC measures installed is at the SEER 15 level or higher, above the minimum requirement levels (Table 15) and the most common non-electric-resistance water heating measure installed is the gas tankless water heater (Table 16).

Table 15. HVAC Systems Installed by SEER Level

SEER Level	Number of Measures	% of Total
SEER 14 and SEER 14.5	324	29%
SEER 15	512	46%
SEER 16	186	17%
SEER 17 or higher	92	8%
Total	**1,114**	**100%**

The program incents customers for switching from electric-resistance water heaters to several other types of water heaters (natural gas, propane, heat pump water heaters, solar). Additionally, the program also incents builders to not install electric-resistance water heaters in new homes by offering them a $250 incentive to install these other types of water heaters. In total, the program incented the installation of 315 non-electric-resistance water heaters; 134 appear to have been installed in newly constructed homes.

Table 16. Water Heating Systems Installed by Measure Type

Measure Type	Number of Measures	% of Total
Water heater - gas tankless	271	86%
Water heater - gas storage	30	9%
Water heater - propane tankless	9	3%
Water heater - heat pump	5	2%
Total	**315**	**100%**

The application process was redesigned at the end of PY1. The process for the program is now set up such that the customers are able to get the rebate application from the SCE&G website or request a copy from SCE&G and the contractor will help them fill it out, but customers are responsible for mailing in the completed application. Putting the customer at the center of the process has improved timeliness of submissions and has relieved the contractors of the administrative burden of filling out applications.

The program receives technical and contractor support from local staff of a third-party implementer, ICF. Additionally, ICF initially processed contractor submitted rebate applications. During the end of PY1, SCE&G changed the method of application processing, moving away from contractor-submitted applications being processed by ICF to processing customer-submitted applications in-house by SCE&G. Additionally, customer support is also now provided in-house by SCE&G. According to SCE&G, this will help make the program more efficient by reducing the cycle time between the services delivered and the delivery of the rebate check as well as improve communication between customers and program staff, thereby increasing customer satisfaction levels.

3.3.3 Impact and Data Tracking Findings

After reviewing the databases and agreed-upon energy savings estimates, the net savings for this program are estimated to be 1,586,379 kWh and 484 kW. The program realized 251% of tracked energy savings and 252% of its tracked demand savings for the HVAC systems and realized 110% of tracked energy savings and demand savings for the water heating systems. The realization rates of over 2.0 for HVAC measures and over 1.0 for water heater measures are due to a number of varying issues in the tracking records. The program implementation team is aware of these issues and changes have been made for the next cycle. We provide a brief summary of the measure-by-measure findings following Table 17 and Table 18.

Table 17. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings for HVAC Equipment

Measure Type	Tracked Quantity	Verified Quantity	Tracked Tons	Verified Tons	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
					kWh	kW	kWh	kW	kWh	kW		kWh	kW
Packaged A/C SEER 14	178	178	531	531	26,990	22.49	66,376	55.32	2.46	2.46	0.7	46,463	38.72
Packaged A/C SEER 15	23	23	70	70	3,680	3.07	9,926	8.27	2.7	2.7	0.7	6,949	5.79
Split A/C SEER 14.5	24	24	74	74	3,204	2.67	9,813	8.18	3.06	3.06	0.7	6,869	5.72
Split A/C SEER 15	34	34	108	108	4,827	4.02	15,262	12.72	3.16	3.16	0.7	10,684	8.9
Split A/C SEER 16	66	66	195	195	10,902	9.09	30,843	25.7	2.83	2.83	0.7	21,590	17.99
Split A/C SEER 17	20	20	65	65	5,782	4.82	16,263	13.55	2.81	2.81	0.7	11,384	9.49
Split A/C SEER 18	4	4	13	13	1,746	1.46	3,801	3.17	2.18	2.18	0.7	2,661	2.22
Packaged ASHP SEER 14	31	31	100	100	5,374	7.57	9,692	13.66	1.8	1.8	0.7	6,784	9.56
Packaged ASHP SEER 15	10	10	31	31	3,568	2.66	7,579	5.64	2.12	2.12	0.7	5,305	3.95
Split ASHP SEER 14.5	21	21	56	56	3,571	3.34	9,524	8.9	2.67	2.67	0.7	6,667	6.23
Split ASHP SEER 15	421	421	1,098	1,098	113,213	84.25	267,053	198.74	2.36	2.36	0.7	186,937	139.12
Split ASHP SEER 16	114	114	345	345	36,419	26.9	99,093	73.18	2.72	2.72	0.7	69,365	51.23
Split ASHP SEER 17	31	31	96	96	10,296	7.4	29,785	21.41	2.89	2.89	0.7	20,850	14.98
Split ASHP SEER 18	31	31	72	72	11,829	8.06	27,283	18.6	2.31	2.31	0.7	19,098	13.02
Packaged DFHP SEER 14	70	70	211	211	7,281	9.8	21,895	29.81	3.01	3.04	0.7	15,327	20.87
Packaged DFHP SEER 15	15	15	41	41	4,117	2.7	11,254	7.62	2.73	2.82	0.7	7,878	5.33
Split DFHP SEER 15	9	9	27	27	2,983	1.96	7,512	5.09	2.52	2.6	0.7	5,258	3.56
Split DFHP SEER 16	6	6	20	20	2,383	1.66	6,008	4.76	2.52	2.88	0.7	4,206	3.33
Split DFHP SEER 18	2	2	5	5	1,558	1.02	1,956	1.28	1.26	1.26	0.7	1,369	0.9
GSHP - EER 19	4	4	14	14	1,915	1.05	6,701	3.66	3.5	3.5	0.7	4,691	2.56
Total	**1,114**	**1,114**	**3,170**	**3,170**	**261,637**	**205.96**	**657,620**	**519.24**	**2.51**	**2.52**	**0.7**	**460,334**	**363.47**

Table 18. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings for Water Heating Equipment

Measure Type	# Units	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
		kWh	kW	kWh	kW	kWh	kW		kWh	kW
Water heater - gas storage	30	0	0	109,800	11.7	NA*	NA*	0.98	107604	11.47
Water heater - gas tankless	271	991,860	105.69	991,860	105.69	1	1	0.98	972023	103.58
Water heater - heat pump	5	14,425	2.5	14,425	2.5	1	1	0.98	14137	2.45
Water heater - propane tankless	9	32,940	3.51	32,940	3.51	1	1	0.98	32281	3.44
Total	**315**	**1,039,225**	**111.7**	**1,149,025**	**123.4**	**1.1**	**1.1**	**0.98**	**1,126,045**	**120.93**

*Given that the tracked gross savings are 0, we cannot calculate the realization rate. However, the total realization rate takes into account the verified gross savings for water heater – gas storage.

HVAC Equipment

We identified an issue with the tracking of HVAC equipment savings during our verification analysis that caused us to increase the savings from the program. While the tracking database applied the correct savings values from the deemed savings spreadsheet, 1,042 HVAC systems were not multiplied by each unit's size to get the total energy and demand savings. The deemed savings spreadsheet specifies savings in terms of kWh per ton and kW per ton. These values must be multiplied by the tons of each system to calculate the total unit's energy and demand savings. This means most measures were recording between one half and one quarter of their actual savings. These issues have been shared with SCE&G and have been rectified in PY2 tracking databases.

The tables below (Table 19 – Table 22) show the deemed savings values that are used to calculate energy and demand savings in the tracked database and carried out in the verified energy savings.

Table 19. Overview of Verification Analysis for Packaged and Split A/C Systems

Measure Label	Units	SEER Range	Tracked Energy Savings (kWh/unit)	Verified Energy Savings (kWh/unit)	Tracked Demand Savings (kW/unit)	Verified Demand Savings (kW/unit)	Notes
Packaged or Split A/C SEER 14	Per ton	14 ≤ x < 14.5	125.03	125.03	0.104	0.104	No change
Split A/C SEER 14.5	Per ton	14.5 ≤ x < 15	133.51	133.51	0.111	0.111	No change
Packaged or Split A/C SEER 15	Per ton	15 ≤ x < 16	141.98	141.98	0.118	0.118	No change
Split A/C SEER 16	Per ton	16 ≤ x < 17	158.58	158.58	0.132	0.132	No change
Split A/C SEER 17	Per ton	17 ≤ x < 18	249.57	249.57	0.208	0.208	No change
Split A/C SEER 18	Per ton	x ≥ 18	293.53	293.53	0.245	0.245	No change

Table 20. Overview of Verification Analysis for Packaged and Split Air Source Heat Pumps

Measure Label	Units	SEER Range	Tracked Energy Savings (kWh/unit)	Verified Energy Savings (kWh/unit)	Tracked Demand Savings (kW/unit)	Verified Demand Savings (kW/unit)	Notes
Packaged Split Air Source Heat Pump SEER 14	Per ton	14 ≤ x < 14.5	97.02	97.02	0.137	0.137	No change
Split Air Source Heat Pump SEER 14.5	Per ton	14.5 ≤ x < 15	170.07	170.07	0.159	0.159	No change
Packaged or Split Air Source Heat Pump SEER 15	Per ton	15 ≤ x < 16	243.11	243.11	0.181	0.181	No change
Split Air Source Heat Pump SEER 16	Per ton	16 ≤ x < 17	286.84	286.84	0.212	0.212	No change
Split Air Source Heat Pump SEER 17	Per ton	17 ≤ x < 18	311.83	311.83	0.224	0.224	No change
Split Air Source Heat Pump SEER 18**	Per ton	x ≥ 18	381.59	381.59	0.260	0.260	No change

** This category contains some ASHPs with SEER ≥ 19, which are Mini-Split Heat Pumps (MSHP)

Table 21. Overview of Verification Analysis for Packaged and Split Dual Fuel Heat Pumps

Measure Label	Units	SEER Range	Tracked Energy Savings (kWh/unit)	Verified Energy Savings (kWh/unit)	Tracked Demand Savings (kW/unit)	Verified Demand Savings (kW/unit)	Notes
Packaged Dual Fuel Heat Pump SEER 14	Per ton	14 ≤ x < 14.5	104.02	104.2	0.140	0.142	Demand Savings values different due to number of significant digits
Split Dual Fuel Heat Pump SEER 14.5	Per ton	14.5 ≤ x < 15	189.25	189.25	0.160	0.163	Demand Savings values different due to number of significant digits
Packaged or Split Dual Fuel Heat Pump SEER 15	Per ton	15 ≤ x < 16	274.49	274.49	0.180	0.186	Demand Savings values different due to number of significant digits
Split Dual Fuel Heat Pump SEER 16	Per ton	16 ≤ x < 17	302.23	302.23	0.210	0.239	Demand savings values are different than what was provided in the deemed savings spreadsheet
Split Dual Fuel Heat Pump SEER 17	Per ton	17 ≤ x < 18	330.93	330.93	0.223	0.223	No change
Split Dual Fuel Heat Pump SEER 18	Per ton	x ≥ 18	397.86	397.86	0.260	0.260	No change

Table 22. Overview of Verification Analysis for Ground Source Heat Pumps

Measure Label	Units	SEER Range	Tracked Energy Savings (kWh/unit)	Verified Energy Savings (kWh/unit)	Tracked Demand Savings (kW/unit)	Verified Demand Savings (kW/unit)	Notes
Ground Source Heat Pump EER 17	Per ton	17 ≤ x < 19	348.17	348.17	0.190	0.190	No change
Ground Source Heat Pump EER 19	Per ton	x ≥ 19	478.64	478.64	0.262	0.262	No change

Water Heating Equipment

Table 23 below lists deemed energy and demand savings for each type of installed water heater with savings designated per each installed unit. The correct deemed savings values were applied for gas and propane tankless, and heat pump water heaters. The realization rates for these systems are equal to one. However, energy and demand savings for 30 gas storage water heaters were not applied in the tracking database. Verified energy and demand savings apply the deemed savings estimates for this equipment. This issue has been addressed by SCE&G.

The program included the replacement of 30 electric resistance water heaters with gas storage water heaters. A total of 315 water heaters were installed in 312 different residential homes. All water heater systems were accounted for in the tracked database. There are no quantity discrepancies identified for this measure.

The program is incenting customers and builders to switch from electric-resistance water heaters to natural gas, propane, electric heat pump and solar water heaters. The program currently assumes that the savings value for existing replacements and new installs is the same. The program does not currently have an explicit variable in the database to determine whether a water heater was placed in new construction or was an existing replacement. We recommend that the program add this variable to its database to allow for further evaluation of the savings being applied in both scenarios.

Table 23. Overview of Verification Analysis for Water Heaters

Measure Label	Units	Tracked Energy Savings (kWh/unit)	Verified Energy Savings (kWh/unit)	Tracked Demand Savings (kW/unit)	Verified Demand Savings (kW/unit)	Notes on Differences between Tracked and Verified Savings (if any)
Gas Storage Water Heater	Per unit	0.0	3,660.0	0.0	0.390	Deemed energy and demand savings was not applied in the tracked database
Gas Tankless Water Heater	Per unit	3,660	3,660	0.390	0.390	No change
Propane Tankless Water Heater	Per unit	3,660	3,660	0.390	0.390	No change
Heat Pump Water Heater	Per unit	2,885	2,885	0.500	0.500	No change

3.4 Home Energy Check-up

3.4.1 Program Description

The Residential Home Energy Check-up (HEC) Program provides homeowners in SCE&G territory with a free home visit that includes a visual inspection of the home and an energy consultation with the customer. During the check-up, SCE&G representatives, who are BPI–certified, identify sources of high energy use and provide the customer with a list of various low and no-cost energy-saving recommendations and tips. As part of the consultation, SCE&G reviews up to two years of consumption data and weather impacts, as well as discusses energy-saving behaviors (thermostat settings, television use, turning lights off, etc) with the customer. During the check-up, participants are also provided with free CFLs, and, if applicable, free hot water pipe insulation and an electric water heater insulating external blanket. Homeowners are encouraged to install the energy efficient measures themselves following the check-up.

Table 24. Energy Efficient Measures Offered through the HEC Program

Measure
13 Watt CFL Light Bulbs (10 pack)
Hot Water Pipe Insulation (6 feet)
Electric Water Heater Insulating External Blanket

3.4.2 Program Performance Summary

While this program accounts for 1% of the total savings from SCE&G's portfolio, total participation in the HEC program exceeded the forecast originally set for the program by almost 50%. Total energy and demand savings from the program also exceeded original forecasts, although to a slightly lesser extent than the number of participants. This program had the advantage of being implemented for the entire 14 months in PY1 and was able to build upon existing administrative, customer in-take, and marketing infrastructure since SCE&G ran a similar program to this one for a few years prior to this DSM program cycle. The table below summarizes the forecast and actual results in terms of costs, participation, and energy and demand savings.

Table 25. PY1 Program Forecasts and Results

	Forecast	Actual	% of Forecast Accomplished
Costs	$396,421	$407,587	103%
Participants	1,367	2,036	149%
Net MWH	492	585	119%
Net MW	0.10	0.14	140%

The program performed check-ups for 2,036[10] residential customers during PY1, from October 2010 through November 2011. Of these, 99% received a package of ten 13W CFLs, 43% received six feet of hot water pipe insulation, and 36% received an insulated water heater blanket for their electric storage water heaters (see table below).

[10] Two participants were removed from the original total (2,038) due to duplicate check-ups performed on two projects.

Table 26. Participation by Measure

Implemented Measure	Number of Unique Participants	% of Participants
13 Watt CFL Light Bulbs (10 pack)	2,029[11]	99%
Hot Water Pipe Insulation (6 feet)	870	43%
Electric Water Heater Insulating External Blanket	723	36%
Home Energy Check-up	2,036	100%

3.4.3 Impact and Data Tracking Findings

After reviewing the databases, the agreed-upon savings estimates, and phone survey results that determined the installation rate for each of the measures, the net savings for this program are 585,151 kWh and 135 kW. Overall, the program realized 68% of its tracked energy savings and 70% of its demand savings. The realization rates of 0.68 and 0.70 are largely due to applying the installation rate for the measures. We provide a brief summary of the measure-by-measure findings following the tables below.

[11] One participant was removed from the original total (2,030) due to duplicate CFL entry for one customer in the tracked database.

Table 27. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings

Measure Type	Tracked Measure Counts	Tracked Number of Units Installed	Verified Measure Counts	Verified Number of Units Installed	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
					kWh	kW	kWh	kW	kWh	kW		kWh	kW
CFL 13 Watt Bulbs (10 pack)	2,030	20,300 bulbs	2,029*	13,189** bulbs	690,200	91	448,409	59	0.65	0.65	0.9	403,568	53
Pipe Insulation (6 feet)	870	5,220 ft	870	3,915 ft	229,680	104	172,260	78	0.75	0.75	0.9	155,034	70
WH Insulating Blanket	723	723	723	492	43,380	18	29,498	12	0.68	0.68	0.9	26,549	11
Total	**3,623**	**26,243**	**3,622**	**17,596**	**963,260**	**214**	**650,167**	**150**	**0.68**	**0.70**	**0.9**	**585,151**	**135**

*One CFL measure was deducted because of a duplicate CFL entry for one customer in the tracked database.
** Verified number of units installed applies an install rate of 65%.

Table 28. Overview of Verification Analysis for Home Energy Check-up

Measure	Program Tracked Savings Assumptions		Verified Energy Savings Assumptions		Tracked Quantity	Verified Quantity	Notes on Differences between Tracked and Verified Savings
	Energy	Demand	Energy	Demand			
CFL 13 Watt Bulbs (10 pack)	34 kWh/lamp	0.0045 kW/lamp	34 kWh/lamp	0.0045 kW/lamp	2,030 installs 20,300 lamps	1,319 installs 13,189 lamps	Participant survey verified that 65% of bulbs distributed were actually installed; one duplicate project entered in tracked database
Pipe Insulation (6 feet)	44 kWh/ft	0.020 kW/ft	44 kWh/ft	0.020 kW/ft	870 installs 5,220 ft of pipe insulation	653 installs 3,915 ft of pipe insulation	Participant survey verified that 75% of pipe insulation distributed was actually installed
WH Insulating Blanket	60 kWh/ blanket	0.025 kW/ blanket	60 kWh/ blanket	0.025 kW/ blanket	723 installs 723 blankets	492 installs 492 blankets	Participant survey verified that 68% of WH blankets distributed were actually installed

Compact Fluorescent Lighting (CFL)

During PY1, participants received a ten pack of low wattage CFL light bulbs to install in their homes. Each CFL was assigned savings of 0.0045 kW and 34 kWh. There were no discrepancies found with the deemed savings values that were applied to the 2,030 lighting measures in the HEC program in comparison to the data provided by ICF. The amount of verified CFLs was overstated by 10 lamps, as one project was tracked having two home check-ups on the same day, and was given two packs (20 lamps) of CFLs. Ten of these CFLs are excluded from the verified energy and demand savings as they are believed to have been entered twice.

The participant surveys conducted verified the number of CFLs each respondent installed in their home. It was found that 65% of the CFLs received through the program, or 6.5 out of every 10 CFLs given to participants, were installed in homes. These numbers were reflected in the verified quantity, thus reducing the actual energy and demand impacts by these installation rates.

Hot Water Pipe Insulation

During PY1, approximately 43% of program participants received six feet of hot water pipe insulation. These participants have electric water heaters and uninsulated hot water pipes. The deemed savings values that were applied to calculate the tracked energy and demand savings were identical to those found in the data provided by ICF (0.02 kW/foot and 44 kWh/foot of insulation). Since each participant who received the hot water pipe insulation was supposed to install the insulation on their own (not installed by program staff), the participant survey obtained an installation rate to accurately quantify the proportion of participants who did install the measure. As a result of the survey, an installation rate of 75% was applied to the 870 participants who received hot water pipe insulation.

Water Heater External Insulation Blanket

Hot water insulation blankets were provided to 36% of the program participants with electric water heaters installed in their home. The deemed savings values that were applied to calculate the tracked energy and demand savings were identical to those found in the data provided by ICF (0.025 kW/blanket, and 60 kWh/blanket). Similar to the pipe insulation, participants were supposed to install the insulation blankets on their own. From participant surveys, it was found that 68% of respondents had installed the insulation blanket around their water heater tanks. This installation rate is reflected in the verified quantity, resulting in reduced energy and demand savings when compared to the tracked savings.

3.5 Energy Information Display

3.5.1 Program Description

The Energy Information Display program provided discounted energy information displays (EID) to SCE&G customers to increase awareness of energy consumption in their homes. Customers who participated received an in-home display device for a charge of $40, with a $20 credit upon confirmation of device activation, bringing the cost to the customer down to $20. Low-income customers received the device at no charge. SCE&G administered this program in-house with customer service support provided by its EnergyWise Contact Center group. The EIDs provide near real-time feedback on energy usage in customers' homes. Based on the program theory, this feedback increases customer awareness of their energy use and thus prompts action to conserve energy or invest in energy efficiency upgrades.

The rollout of this program took place in two phases and used two different devices. During the Phase 1 program, which began November 2010, 248 residential customers received an AzTech in-home display device free of charge.

During the Phase 2 program, which began about a year later (on October 27, 2011), the program switched to the EnergyHub in-home display, which provided a more colorful, user-friendly interface as well as options for push notifications. Energy Hub devices were mailed to 252 Home Energy Report participants. Customers received an Energy Hub device for a charge of $40, with a $20 credit upon confirmation of device activation, bringing the cost to the customer down to $20.

In total, the program records indicate that 500 residential customers received EIDs in PY1.

3.5.2 Program Performance Summary

Overall, this program provided a very small portion (0.4%) of the overall savings achieved in PY1. The savings per participant, however, is expected to be higher than those achieved through the HER. As such, this program has the potential to achieve greater savings in future years.

Table 29 below summarizes the forecasted participation and savings as compared to the actual participation and savings. Actual savings were calculated by multiplying the deemed savings by the number of actual participants (see Table 30). The program reached 16% of its forecasted number of participants. We note here that the initial forecasted participation goals for the EID program are much higher than typical first-year participation numbers for similar programs.

Table 29. PY1 Program Forecast and Actuals

	Forecasts	Actual	% of Forecast Accomplished
Cost	$583,527	$266,886	46%
Participants	3,117	500	16%
Net MWH	1,247	200	16%
Net MW	0.20	0.032	16%

Forecasts calculated based on assumed energy and demand savings per participants, multiplied by participation forecast and assumed NTG ration.

3.5.3 Impact Findings

For this report, the evaluation team verified that there were 500 unique customer records in the tracking database, and then applied the estimated per-participant energy and demand savings

specified in the planning assumptions. After applying the assumed energy and demand savings per participant, the net savings for this program are estimated to be 200,000 kWh and 32 kW. Table 30 shows the deemed energy and demand savings that were applied to each participant.

Table 30. Application of Deemed Savings Per Participant

Description	Number of Units	Assumed kWh Savings Per Participant	Assumed KW Savings Per Participant	Gross Savings kWh	Gross Savings kW	PY1 NTGR	Net Savings kWh	Net Savings kW
Forecast Total	3117	500	0.08	1,558,500	249.36	0.8	1,246,800	199.488
Tracked Total	500	500	0.08	250,000	40	0.8	200,000	32
% of forecast	0.16			0.16	0.16		0.16	0.16

Since these savings were not in the South Carolina Measures database, the evaluation team could not conduct a verification of the savings associated with the EID program. The savings values identified in this report are from the planning model, and the actual savings associated with the EID program may increase or decrease depending on the actual consumption patterns of the participants. The assumed 500 kWh per person estimate is approximately 3.5% of the average residential energy consumption[12], which is conservative compared to similar programs in other areas of the country. EIDs can generate as much as 12% evaluated savings, depending on the program offerings, but most realize between 3.4%-9.3% savings.

[12] Average residential consumption per year estimated at 14,300 kWh based on sales and customer numbers provided in the Testimony of Randy Gunn on behalf of the Office of Regulatory Staff in conjunction with evaluation.

3.6 ENERGY STAR New Homes

3.6.1 Program Description

Overall, the Residential ENERGY STAR® New Homes Program is a small component of the portfolio of the SCE&G portfolio but one with long-term ramifications as the homes built to the ENERGY STAR standards will be in place for decades. This is a national program created through the U.S. Environmental Protection Agency (EPA). The SCE&G program officially started in April 2011. The program is designed to improve the energy efficiency of the residential construction market by labeling qualifying homes as ENERGY STAR. The homes in PY1 were built to ENERGY STAR Version 2.5 specifications. Increased efficiency, and therefore energy savings is typically achieved through a combination of building envelope upgrades, high performance windows, controlled air infiltration, upgraded heating and air conditioning systems, tight duct systems, and upgraded water-heating equipment.

The objective of the program is to accelerate the penetration of ENERGY STAR New Homes. The expected savings from the program are based on the number of ENERGY STAR qualifying homes built in SCE&G territory per program year.

Typically, Home Energy Rating System (HERS) raters review home plans, and then inspect built homes to ensure performance. After a home passes a HERS rater inspection, a home will receive the ENERGY STAR label; and the builder receives a $750 rebate from SCE&G for each home built to ENERGY STAR standards.

New construction builders who participate in the program are required to hire a third party Residential Energy Services Network (RESNET) certified HERS rater who verifies that each home complies with V2.5 criteria. The HERS rater inspects the home for two different phases: mid-construction and final completion phases. The mid-construction phase is to ensure that all envelope measures are installed according to ENERGY STAR standards prior to the installation of drywall or sheetrock. A second inspection is conducted once the home construction is complete, where a blower door and duct blast test is conducted to test and measure the infiltration of the home and the duct leakage. All characteristics for each home are modeled in RESNET-accredited software (REM/Rate or Energy Gauge) to generate a HERS score and to qualify the home passes ENERGY STAR standards.

The program conducted several recruitment sessions and training sessions in PY1 to educate builders and raters on sales practices and the changes in 2011 when ENERGY STAR requirements changed from version 2.0 to version 2.5. The requirements are changing again in 2012 as all new homes permitted on or after January 1, 2012 will have to meet ENERGY STAR Version 3 requirements. Version 3 requirements are more stringent than the current V2 and V2.5 versions. They include stricter guidelines for large homes, two new HVAC system checklists, and a Water Management System checklist in addition to the existing Thermal Enclosure System Checklist and a required HERS rating that is individualized based on the ENERGY STAR Reference Design Home.[13] Therefore, program activities in PY1 and PY2 are focused on educating builders and HERS raters on the changing requirements.

[13] Version 3 guidelines can be found here: http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/NationalProgramRequirements_v3.pdf

In addition to training activities, the program provides builders with ENERGY STAR yard signs and flags to help market ENERGY STAR rated homes in South Carolina.

3.6.2 Program Performance Summary

The program provided incentives to a total of 86 homes in PY1, which was about half of what was forecasted. The actual number of participating homes was less than forecasted due to a number of factors including a later start date than planned, difficult economic times leading to reduced home building in general, and the ongoing changes to the ENERGY STAR version requirements. Program staff mentioned that the ongoing changes to ENERGY STAR version requirements, happening at the national level for this program, are leading to frustration among builders and turning some builders and raters away from the program. While the program provided incentives to fewer homes than forecasted, the savings per home were almost twice the amount anticipated given that the program forecasting was based on ENERGY STAR V2.0 but the program operated under V2.5 requirements.

Table 31. PY1 Program Forecast and Actuals

	Forecast	Actual	% of Forecast Accomplished
Cost	274,000	388,005	142%
Homes	188	86	46%
Net MWh	169	196	116%
Net MW	.060	.057	95%

In PY1, the program recruited 28 builders to the program, 8 of which were active in the program in PY1. The program provided incentives to a total of 86 homes that were built to ENERGY STAR version 2.5 standards. As shown in the table below, participating builders received between 2 and 24 incentive rebates in PY1.

Table 32. Participation by Builder

Builder	Total Homes
Builder 1	24
Builder 2	15
Builder 3	14
Builder 4	13
Builder 5	10
Builder 6	4
Builder 7	4
Builder 8	2
Grand Total	86

The program also recruited 8 HERS raters, 4 of whom were active in PY1.

Table 33. Participation by HERS Rater

HERS Rater	Total Homes
Rater 1	44
Rater 2	15
Rater 3	14
Rater 4	13
Grand Total	**86**

Table 34 is a summary of the number of homes for each HERS Index score that was achieved throughout PY1. The HERS index ranged from 62-74 on PY1 participating homes, which is typical for similar programs across the country operating under V2.5 standards according to program staff running the same program in multiple areas across the country.

Table 34. Home Energy Rating (HERs) Score

HERs Index Score	Number of Participants	% of Total
70 – 74	28	33%
65-69	44	51%
62-64	14	16%
Total	**86**	**100%**

2011 was a transitional year for the program. The planning model for PY1 for this program was based on ENERGY STAR V2.0 (which was 15% more efficient than a 2006 IECC built home); however, V 2.5 was actually in effect during PY1 (which is 25-30% more than code) and SCE&G chose to incent based on this higher level. Therefore, the program got more savings per home than it originally expected. 2012 will be another transitional year for the program, given that ENERGY STAR version 3.0 will be in effect starting with homes permitted on or after January 1, 2012. Therefore, PY2 will still be a challenging year for the program.

3.6.3 Impact Findings

Energy savings for this program are calculated through ICF's predictive savings tool which draws from data inputted into REM/Rate or Energy Gauge software. Therefore, the energy savings for each home are unique. Impact evaluation of this program is limited in PY1 and PY2 given the ongoing changes with version requirements and that this program comprises a small percentage (0.3%) of the overall SCE&G portfolio of programs. Efforts in PY1 and PY2 are limited to ensuring that the program tracking database will allow for verifying gross savings based on a simulation model approach in PY3. The program accurately captures the energy savings for each home based on modeling output. After reviewing the database, the net savings for this program are estimated to be 195,883 kWh and 56.76 kW. Overall, the program achieved 116% of its forecasted energy savings and 95% of its demand savings. Table 35 compares the program's forecasted energy savings to the tracked energy savings.

Table 35. Summary of Forecast versus Actual Energy (kWh) and Demand (kW) Savings

Description	Number of Units	Gross Savings		PY1 NTGR	Net Savings	
		kWh	kW		kWh	kW
Forecast Total	188	187,778	66.67	0.9	169,000	60.00
Tracked Total	86	217,648	63.07	0.9	195,883	56.76
% of Forecast	0.46	1.16	0.95	n/a	1.16	0.95

Overall, the program realized 253% of its forecasted average energy savings per home and 207% of its forecasted average demand savings per home. Table 36 compares the program forecasted savings per home to its actual tracked energy savings.

Table 36. Summary of Average Energy (kWh) and Demand (kW) Savings per Home

Description	Number of Units	Gross Savings		PY1 NTGR	Net Savings	
		kWh	kW		kWh	kW
Forecast Average per Home	188	998.81	0.354	0.9	898.94	0.319
Tracked Average per Home	86	2,530.79	0.733	0.9	2,277.71	0.660
Savings Per Home Difference	0.46	2.53	2.07	n/a	2.53	2.07

3.7 Residential Home Performance with ENERGY STAR

3.7.1 Program Description

The Home Performance with ENERGY STAR (HPwES) program includes a comprehensive assessment and diagnostic testing of a customer's home by trained contractors. The program is designed to help customers recognize energy solutions for their home by taking the "whole-house" approach to energy efficiency. Contractors provide participants with a comprehensive report that is generated using *BEACON Home Energy Advisor™*, a trademark of the program implementer, ICF International (ICF). The report outlines recommended energy efficient improvements and specifies the estimated energy savings associated with these measures. Customers initially incur the cost of the home audit, which can range from $200 to $600 (cost set by individual contractors). However, if at least one eligible measure is installed and rebated through the program, the customer can receive a $200 rebate to offset the cost of the audit. See the following table for a complete list of measures that are eligible for rebates through the HPwES program.

Table 37. Eligible Rebated Measures

Eligible Measure	Rebate
Home Performance Assessment (requires completion of eligible improvements)	$200
Category 1: Envelope Improvements	
Air Infiltration Reduction of 15% or greater	25% of cost up to $850
Attic Insulation	
Wall Insulation (includes rim joist)	
Category 2: Heating and Cooling Performance Improvements	
Duct Sealing (50% Reduction in leakage or 150 CFM)	$150
Duct Insulation (or replacement)	$150
Central AC or Heat Pump Tune-up	$60
Programmable Thermostat (requires ramp-up technology for heat pumps)	$50
Category 3: Heating and Cooling Equipment	
Split System Central A/C	$200-$300
Packaged Central A/C	$200-$300
Split System Heat Pump (Air Source or Dual Fuel)	$200-$300
Packaged Heat Pump	$200-$300
Ground Source Heat Pump	$375-$525
Category 4: Water Heating Equipment	
Non-Electric Resistance Water Heater (Gas Storage, Gas Tankless, Propane, Heat Pump and Solar Water Heater)	$250
Comfort Home Package Bonus	
Bonus Incentive: Install at least one measure from three categories (Envelope Improvements, Heating and Cooling Performance Improvements, Heating and Cooling Equipment, and/or Water Heating Equipment)	$400

To be eligible to receive rebates for the home assessment and qualified measures installed, the inspection and installations must be completed by an SCE&G HPwES participating contractor. Participating contractors are recruited and trained by the program implementer on both the program and the BEACON audit assessment tool. A directory of participating contractors who have Building Performance Institute BPI- Building Analysts certification are listed on the SCE&G website.

3.7.2 Program Performance Summary

In PY1, the focus of the HPwES program was establishing a network of qualified contractors and ramping up administrative systems for the program. As such, the program contributed 0.1% of the overall savings from SCE&G's portfolio.

HPwES programs are often slow to start up due to significant initial costs to establish infrastructure and train contractors during the early years.[14] The program was launched in March 2011, but the initial months were spent enrolling and training a network of 19 participating contractors. Due to the small number of participating contractors in the beginning of the program, the number of customers reached was also fewer than expected, as the program directs its marketing and outreach towards contractors, who, in turn, reach out to customers.

The following table summarizes the goals and overall results for the program in terms of costs, participation, and energy and demand savings.

Table 38. PY1 Program Forecasts and Results

	Forecast	Actual	% of Forecast Accomplished
Costs	$1,384,055	$736,428	53%
Participants	512	33	6%
Net MWh	1,319	79.5	6%
Net MW	0.29	0.023	8%

The HPwES program had a total of 33 participants during PY1, which began when the program was launched in March 2011 and ended in November 2011. These participants received a home energy audit and a rebate for one or more of the recommended energy efficiency measures. Table 39 shows the types of measures that were rebated to participants in PY1.

Table 39. Participation by Rebated Measure

Implemented Measure	Number of Participants	% of Participants
Air Sealing	31	94%
Attic Insulation	16	49%
Duct Sealing	11	33%
Duct Insulation	4	12%
Programmable Thermostat	3	9%
Heat Pump	2	6%
Wall Insulation	1	3%
Rim Joist Insulation	1	3%
Water Heater	1	3%
Home Performance Assessment (Total Participants)	33	100%

[14] Maryland and California, among others, are experiencing similar ramp up times.

3.7.3 Impact and Data Tracking Findings

The net savings for the HPwES program are tracked by the program implementers as 88,378 kWh and 25.77 kW. When we apply the NTGR, the savings are 79,540 kWh and 23.20 kW.

Table 40. Tracked Energy and Demand Savings

Description	Number of Participants	Gross Savings				PY1 NTGR	Net Savings	
		Assumed kWh Savings Per Participant	Assumed KW Savings Per Participant	kWh	kW		kWh	kW
Tracked Total	33	Varies per participant (Ranges from 228 kWh to 9,763 kWh)	Varies per participant (Ranges from 0.075 to 2.5)	88,378	25.77	0.9	79,540	23.20

Phone verification efforts with 9 participants who installed measures in PY1 confirmed that all measures were installed. Note that for whole house programs, measure-by-measure deemed savings estimates are not the best indication of savings due to the interactive effects of the measures and the unique characteristics of the house. In addition, some of the measures installed through the program are not currently captured in the SCMDB so it is not possible to estimate savings on a measure-by-measure level using a deemed savings value.[15] Due to the unique nature of this program, the evaluation team was unable to verify tracked savings.

However, as part of the program, contractors estimate unique household level savings through the BEACON software, which models the recommended measures within the unique household. For whole home programs, modeled energy savings are more accurate than calculations that are based on system-by-system analyses. The evaluation team will work with SCE&G to further discuss what information should be tracked through the program, and whether BEACON reports could be used in the future to estimate savings. Note that while additional research is needed to gain a better sense of the savings from this program, the overall program contributed less than 1% of overall portfolio savings in PY1. As such, we defer to the tracked savings for the PY1 estimates.

[15] Note that in later years, if evaluation results show stable savings per household, a deemed savings estimate may be possible.

3.8 Heating and Cooling Efficiency Improvement

3.8.1 Program Description

The Residential Heating and Cooling Efficiency Improvement Program provides one-time incentives to encourage customers to improve the efficiency of existing in-service central air conditioners and heat pump systems in existing homes. The program's major goal is to assist customers with energy efficiency maintenance and repair opportunities, including tune-ups (i.e., refrigerant charge and air-flow correction), duct sealing, and duct insulation. To participate in this program, the customer must receive residential electric service from SCE&G in an existing separately metered residence.

Table 41. Program Incentives Offered

Eligible Efficiency Improvement Services	Rebate Amounts
Tune-up of Existing Central A/C or Heat Pump	$60
Duct Insulation in Existing Home	$150
Duct Sealing in Existing Home	$150

The services are delivered through independent HVAC contractors that have participated in SCE&G-sponsored technical training. In PY1, about 40 contractors participated in the SCE&G-sponsored training. This training enables contractors to conform with defined HVAC tune-up protocol required and be eligible for continuing education credits. All licensed HVAC contractors who complete the program-sponsored technical training on the required protocols for tune-ups and duct improvements are able to perform the efficiency improvement services. The training services provided by SCE&G also provided contractors with skills to expand their services and add a new revenue stream to their business.

For PY1, the application process was set up so that participating HVAC contractors were at the center of both the marketing and administration of rebate applications. The contractors were responsible for completing the rebate applications online and ensuring that their customers received their rebates in a timely manner. It is believed that this system presented a number of opportunities for improvements that would increase participation along with customer and contractor satisfaction.

The application process was subsequently redesigned at the end of PY1. The process for the program is now set up such that the customers are able to get the rebate application from the SCE&G website or request a copy from SCE&G and the contractor will help them fill it out, but customers are responsible for mailing in the completed application. Additionally, contractors must fill out and submit SCE&G worksheets for the services provided (these worksheets are available only through participation in a training session/event and must be submitted along with the rebate application). Putting the customer at the center of the process has improved timeliness of submissions and has relieved the contractors of the administrative burden of filling out applications.

3.8.2 Program Performance Summary

The program is a relatively new type of program which requires intensive training of the contractors upfront. As such, it requires time to ramp-up activities and increase contractor participation. The program was launched in March 2011. Due to this timing, the program missed the season where maximum tune-ups occur (a few months before the start of summer), thereby impacting participation. Additionally, due to the small number of participating contractors in the beginning of the program, the number of customers reached was also small, as the program directed its

marketing and outreach towards contractors, who, in turn, reach out to customers. As such, the PY1 results have fallen short of the forecasts set for the program.

Table 42 summarizes the forecasts and overall results for the program in terms of costs, participation, and energy and demand savings. In total, this program makes up 0.1% of the total savings delivered from SCE&G's energy efficiency programs; however, the program is expected to significantly increase participation and savings in 2012.

Table 42. PY1 Program Forecasts and Results

	Forecast	Actual	% of Forecast Accomplished
Cost	$1,177,231	$698,356	59%
Participants	4,932	85	2%
Net MWH	2,816	37.6	1%
Net MW	1.29	0.02	2%

Eighty-five customers participated in this program in PY1. Table 43 shows the total measures installed in customer homes.

Table 43. Participation by Measure

Measures	Measure Counts
Tune-up	10
Duct Insulation	79
Duct Sealing	36
Total Measures	**125**

*The total number of unique customers is not a sum of the services provided given that 28 participants implemented 2 measures and 6 participants implemented 3 measures.

The program receives technical and contractor support from local staff of a third-party implementer, ICF. Additionally, ICF initially processed contractor submitted rebate applications, During the end of PY1, SCE&G changed the method of application processing, moving away from contractor-submitted applications being processed by ICF to processing customer-submitted applications in-house by SCE&G. According to SCE&G, This change will help make the program more efficient by reducing the cycle time between the services delivered and the delivery of the rebate check as well as improve communication between customers and program staff, thereby increasing customer satisfaction levels. The program is also increasing outreach efforts to directly reach and inform residential customers about the services offered through the program.

3.8.3 Impact and Data Tracking Findings

After reviewing the databases and the agreed-upon savings estimates, we estimate the net savings for this program to be 37,600 kWh and 24.7 kW. Overall, the program realized 100% of its tracked energy savings and 100% of its tracked demand savings. We provide a brief summary of the measure-by-measure findings following Table 44 and Table 45.

Table 44. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings

Measure Type	Total Implemented Measures	Total Conditioned Floor Area (Sq. ft)	Tracked Gross Savings		Verified Gross Savings		Realization Rate		PY1 NTGR	Verified Net Savings	
			kWh	kW	kWh	kW	kWh	kW		kWh	kW
SF - Duct Insulation in Existing Home	79	136,219	24,493	17.9	24,493	17.9	1	1	0.8	19,595	14.3
SF - Duct Sealing in Existing Home AC	25	51,639	9,707	6.4	9,707	6.4	1	1	0.8	7,766	5.1
SF - Duct Sealing in Existing Home HP	11	26,617	8,652	2.3	8,652	2.3	1	1	0.8	6,922	1.8
SF - Tune-Up of Existing Central A/C	7	15,660	2,996	3.1	2,996	3.14	1	1	0.8	2,397	2.51
SF - Tune-Up of Existing Heat Pump	3	5,600	1,152	1.2	1,152	1.21	1	1	0.8	922	0.97
Total	**125**	**235,735**	**47,000**	**30.9**	**47,000**	**30.9**	**1**	**1**	**0.8**	**37,600**	**24.7**

Table 45. Overview of Verification Analysis for Efficiency Improvements

Measure	Program Tracked Savings Assumptions		Verified Energy Savings Assumptions (*Ex Ante*)		Tracked Quantity	Verified Quantity	Notes on Differences between Tracked and Verified Savings
	Energy	Demand	Energy	Demand			
Duct Insulation in Existing Home	179.81 kWh/1000 ft^2	0.131 kW/1000 ft^2	179.81 kWh/1000 ft^2	0.131 kW/1000 ft^2	79 installs 136.22 ft^2/1000	79 installs 136.22 ft^2/1000	No changes
Duct Sealing in Existing Home with A/C	187.98 kWh/1000 ft^2	0.124 kW/1000 ft^2	187.98 kWh/1000 ft^2	0.124 kW/1000 ft^2	25 installs 51.64ft^2/1000	25 installs 51.64 ft^2/1000	No changes
Duct Sealing in Existing Home with Heat Pump	325.06 kWh/1000 ft^2	0.086 kW/1000 ft^2	325.06 kWh/1000 ft^2	0.086 kW/1000 ft^2	11 installs 26.62 ft^2/1000	11 installs 26.62 ft^2/1000	No changes
Tune-Up of Existing A/C	133.15 kWh/ton	0.140 kW/ton	133.15 kWh/ton	0.140 kW/ton	3 installs 22.5 tons	3 installs 22.5 tons	No changes
Tune-Up of Existing Heat Pump	143.99 kWh/ton	0.151 kW/ton	143.99 kWh/ton	0.151 kW/ton	7 installs 8.00 tons	7 installs 8.00 tons	No changes

Duct Insulation

During PY1, 90% of program participants improved their duct insulation. There were no problems found with either the quantities or the savings values applied to the 79 duct insulation measures in the program. The tracked energy and demand savings match the deemed values listed in the SCMDB. It should be noted that the SCMDB, created as a joint effort between several utilities with different service territories, calculated savings for five South Carolina locations (Charleston, Columbia, Florence, Greenville, and Myrtle Beach), but SCE&G tracked savings averages values for Charleston and Columbia only as Florence, Greenville and Myrtle Beach are not in SCE&G's electric service territory.

Duct Sealing

During PY1, 39% of program participants sealed their ducts. There were no problems found with either the quantities or the savings values applied to the 25 duct sealing measures on HVAC systems and the 11 duct sealing measures on heat pump systems. The tracked energy and demand savings match the deemed values listed in the SCMDB. The savings values assume that the ducts originally had a leakage rate of 20%. It should be noted that the SCMDB, created as a joint effort between several utilities with different service territories, calculated savings for five South Carolina locations (Charleston, Columbia, Florence, Greenville, and Myrtle Beach), but SCE&G tracked savings averages values for Charleston and Columbia only as Florence, Greenville and Myrtle Beach are not in SCE&G's electric service territory.

HVAC Tune-Ups

Only 9% of program participants tuned up their HVAC equipment during PY1. There were no discrepancies found with either the quantities or the savings values applied to the HVAC and heat pump performance tune-ups. The tracked energy and demand savings match the deemed savings values listed in the SCMDB. The 10 systems that received tune-ups made up about 9% (4,148 kWh) of the total energy savings and 14% (4.3 kW) of the overall demand savings for this program. It should be noted that the SCMDB, created as a joint effort between several utilities with different service territories, calculated savings for five South Carolina locations (Charleston, Columbia, Florence, Greenville, and Myrtle Beach), but SCE&G tracked savings averages values for Charleston and Columbia only as Florence, Greenville and Myrtle Beach are not in SCE&G's electric service territory.

3.9 Commercial & Industrial Prescriptive & Custom

3.9.1 Program Description

The SCE&G EnergyWise for your Business program includes two distinct programs, a prescriptive program and a custom program. We combined these two programs into one in this report for simplicity and because there were few participants in the custom program. The programs offer incentives to businesses to encourage installation of high efficiency equipment and building improvements that reduce energy costs. The programs are available to all eligible commercial and industrial customers in the SCE&G service territory. Note that industrial customers were given the opportunity to, and many have chosen to, opt-out of the DSM programs. The programs started with the launch of the lighting incentives in October 2010; additional technologies were phased in over the course of the program year.

There are two distinct programs for obtaining incentives:

- Prescriptive incentives are provided for common energy-efficiency equipment upgrades and improvements including lighting, HVAC, food service, and variable speed drives. Incentives are paid based on the quantity, size, and efficiency of the equipment. Table 46 lists the prescriptive incentives for PY1.
- Custom incentives are available for more complex or site-specific energy-saving projects or multi-measure projects that are not included in the prescriptive program. Incentives for PY1 were calculated on a project-by-project basis and capped at $25,000.

Table 46. PY1 Prescriptive Incentive Levels

Technology	Incentive
Lighting	
Lamp and Ballast Retrofits	$5-$13/Fixture
Permanent Delamping	$15-$30/Fixture
Commodity Fixtures	$15-$25/Fixture
Advanced Fixtures	$30-$40/Fixture
Fluorescent High Bay Fixtures	$40-$100/Fixture
High Intensity Discharge	$40-$100/Fixture
Compact Fluorescent	$2 Lamp and $10-$20/Fixture
LED Exit Signs	$10/Sign
Lighting Controls	$20-$50 Sensor or Ballast Controlled
New Construction	Lighting Power Density
LED Integral Replacement Lamps	$25-$30/Lamp
LED Downlight Fixtures	$60/Fixture
LED Exterior Fixtures	$150-$175/Fixture
LED Traffic Signals	$10-$25/Unit
Food Service	
Steam Cookers	$300-$600/Unit
Insulated Hot Holding Cabinets	$200-$400/Unit
Electric Fryers	$150/vat
Electric Griddles	$200/Unit
Electric Convection Ovens	$200/Oven
Electric Combination Ovens	$1,000/Unit
Ice Machines (Tier 2)	$75-$250/Unit
Ice Machines (Tier 3)	$150-$525/Unit
Reach-in Refrigerators	$50-$125/Unit
Glass Door Reach-In Refrigerators	$50-$125/Unit
Reach-in Freezers	$50-$125/Unit
Commercial Clothes Washers	$50/Unit
HVAC	
Unitary and Matched AC and Heat Pumps	$10-$30/Ton (depending on EER/IEER/SEER)
Water and Evaporative AC and Heat Pumps	$30/Ton
Packaged Terminal Air Conditioners	$10-$20/Unit
Single Speed Chillers	$20-$35/Ton + $3-$8 Performance Incentive
VFD Controlled Chillers	$10-$25/Ton + $6-$12 Performance Incentive
HVAC VFDs	$650-$6200/Unit depending on HP

The program staff conducted several training sessions throughout PY1 to introduce and educate contractors on the program. Almost seventy contractors were trained on the requirements of the program. Similar to this program, business programs often use contractors as a vehicle to reach customers because they can leverage existing business relationships. SCE&G held contractor trainings throughout the service territory in order to ensure coverage in all geographic areas. The trainings consisted of discussions about the technologies incentivized, the documentation requirements necessary for submitting applications and the participation rules for eligible customers. In addition, the program implementers conducted informational sessions with C&I customers throughout SCE&G's territory. Further, SCE&G customer account representatives reached out to key accounts to inform them of program incentives available.

3.9.2 Program Performance Summary

Overall the Program accounts for 14% of SCE&G's PY1 savings. As shown in Table 47, participation and the resulting energy and demand savings for this program were less than forecasted for PY1.

Table 47. PY1 Program Forecast and Actual Results

	Forecast	Actual	% of Forecast Accomplished
Cost	$4,806,094	$3,264,069	68%
Participation[16]	462	329	71%
Net MWH	52,184	8,017	15%
Net MW	5.86	1.52	26%

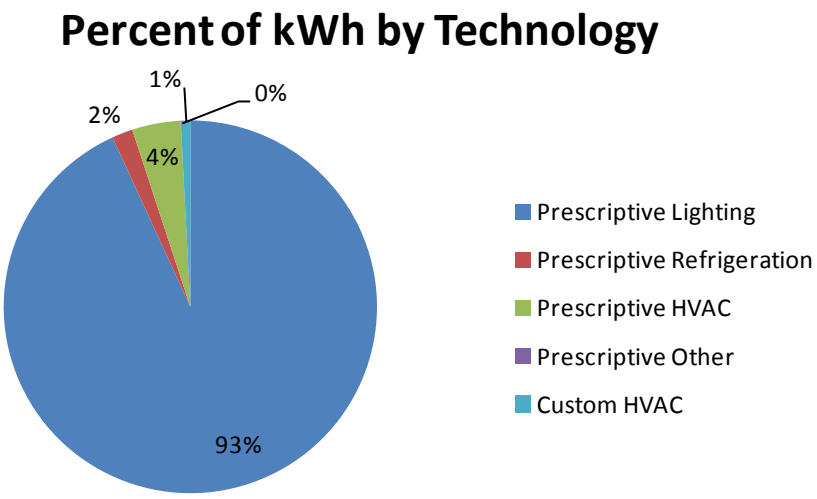
The program missed its first year forecast for several reasons. After the program plans were submitted to the Commission, industrial customers were granted the right to opt-out of the program. As of the close of PY1[17], 379 industrial accounts had opted out of SCE&G's DSM programs. Retail electric sales associated with these accounts represent approximately 71% of SCE&G's industrial load. The program's forecasted participation in this program did not anticipate that this would happen; therefore this significantly impacted the program's ability to reach the forecast. Notably, the first year of a Commercial program typically requires a significant investment in marketing, contractor training and basic infrastructure development. The energy savings of this investment in the first year is often not realized until the second or even third year of a program cycle. C&I customers need time from when they become aware of incentives to move through their business' decision-making process for such an investment and work the investment into annual budget planning cycles which vary from business to business.

Figure 1 shows the PY1 savings (kWh) that were derived from each measure category. Most of the program's energy savings came from lighting projects and this is quite common in business programs, especially when the program is new. Lighting projects generally have the quickest payback and can be implemented quicker than other projects.

[16] Actual participation is based on number of unique projects paid in PY1.

[17] According to SCE&G's recent filing with the Commission Docket # 2012-55-E

Figure 1. Energy Savings by Project Type



Impact and Data Tracking Findings

After reviewing the databases and agreed-upon savings estimates, the net savings for this program are estimated to be 8,016,858 kWh and 1,517 KW. Overall, the evaluation team was able to verify 95% of the energy savings and 100% of the demand savings. The program gross savings realization rates were very close to 1. The program provided several documents and spreadsheets that showed the deemed savings values for measures. A number of adjustments were made when the savings values tracked did not match the documentation that was provided. The evaluation team plans to work together with SCE&G and the program implementer to ensure that the program has adequate documentation for all savings assumptions associated with all measures incented through the program.

Table 48. Summary of Tracked and Verified Energy (kWh) and Demand (kW) Savings

Category	Measure Type	Quantity Installed	Tracked Gross Savings		Verified Gross Savings		Realization Rate		NTGR	Verified Net	
			kWh	kW	kWh	kW	kWh	kW		kWh	kW
Prescriptive Lighting	T8 Lighting	21,127	3,309,589	659	3,277,021	649.1	0.990	0.985	0.8	2,621,616	519.3
	High Bay Lighting	2,172	2,384,100	329.3	2,402,929	331.9	1.008	1.008	0.8	1,922,343	265.5
	CFL Fixtures or Screw-In	994	338,676	44.4	384,107	55.9	1.134	1.259	0.8	307,285	44.7
	LED Interior & Exterior	815	340,590	24.7	340,590	24.7	1.000	1.000	0.8	272,472	19.8
	LED Exit Signs	290	67,367	6	67,367	6.0	1.000	1.000	0.8	53,894	4.8
	Occupancy Sensors, Daylighting	7,662	2,604,713	604.6	2,884,259	716.2	1.107	1.185	0.8	2,307,407	573.0
Prescriptive Refrigeration	Cooler/Freezer Lights & Controls	280	746,632	92.5	90,543	17.7	0.121	0.19	0.8	72,435	14.1
	Coolers/Freezers, Anti-Sweat Heater Controls	39	49,908	0.8	49,908	0.8	1	1	0.8	39,926	0.6
	Cooler/Freezer ECMs	6	338	44.2	3,378	0.4	10	0.01	0.8	2,702	0.4
	Vending/Ice	32	56,060	0.9	31,700	21.7	0.565	24.65	0.8	25,360	17.3
Prescriptive HVAC	VFD	11	206,131	20	205,380	18.8	0.996	0.94	0.8	164,304	15
	Split/Unitary Systems	34	41,460	27.7	18,362	12.3	0.443	0.44	0.8	14,689	9.8
	Chillers	2	271,840	31.3	183,605	38.7	0.675	1.24	0.8	146,884	31
Prescriptive Other	Convection Ovens	1	2,262	0.5	2,262	0.5	1	1	0.8	1,810	0.4
Custom HVAC	EMS	1	79,662	2	79,662	2	1	1	0.8	63,730	1.6
TOTAL		**33,466**	**10,499,328**	**1,887.9**	**10,021,072**	**1,897**	**0.954**	**1.005**	**0.8**	**8,016,858**	**1,517**

Table 49. Overview of Verification Analysis for Efficiency Improvements Per Unit

Measure	Program Tracked Savings Assumptions		Verified Energy Savings Assumptions		Tracked Quantity	Verified Quantity	Notes on Differences between Tracked and Verified Savings
	Energy kWh	Demand kW	Energy kWh	Demand kW			
T8 Lighting	157	0.031	155	0.031	21,127	21,127	Adjustments to measures from 3 lighting M&V projects.
High Bay Lighting	1097	0.152	1106	0.153	2,172	2,172	Adjustment to measures from 1 lighting M&V project.
CFL Fixtures or Screw-In	340	0.045	386	0.056	994	994	Adjustments to measures from 2 lighting M&V projects.
LED Interior & Exterior	417	0.030	418	0.030	815	815	No adjustments made.
LED Exit Signs	232	0.021	232	0.021	290	290	No adjustments made.
Occupancy Sensors, Schools	897	0.296	1020	0.381	975	975	Adjustments to measures from 5 lighting M&V projects.
Occupancy Sensors, non-schools	259	0.047	283	0.052	6,687	6,687	Adjustments to measures from 2 lighting M&V projects.
Cooler/Freezer Lights	410	0.047	410	0.047	217	217	Deemed savings values provided by ICF. One measure mistakenly multiplied by number of units (40) twice.
Cooler/Freezer Light Controls	285	0.149	285	0.149	63	63	Deemed savings values provided by ICF.
Glass Door Cooler, 31-50 cu ft	734	0.084	734	0.084	3	3	Deemed savings values provided by ICF.
Glass Door Cooler > 50 cu ft	945	0.108	945	0.108	1	1	Deemed savings values provided by ICF.
Reach-In Cooler, 15-30 cu ft	1069	0.122	1069	0.122	1	1	FES-G6 deemed savings values were used correctly.
Reach-In Freezer, 31-50 cu ft	507	0.058	507	0.058	4	4	FES-G6 values were used correctly.
Reach-In Freezer > 50 cu ft	483	0.055	483	0.055	1	1	FES-G6 values were used correctly.
Cooler/Freezer ECMs	56.3	7.373	563	0.07373	6	6	Deemed savings values provided by ICF. Values are off by orders of magnitude.
Anti-Sweat Heaters	1489	0.0	1489	0.0	29	29	FES-G2, values okay.

Measure	Program Tracked Savings Assumptions		Verified Energy Savings Assumptions		Tracked Quantity	Verified Quantity	Notes on Differences between Tracked and Verified Savings
	Energy kWh	Demand kW	Energy kWh	Demand kW			
Vending Controls	1612	0.0	800	0.210	30	30	Corrected FES-C3 deemed savings values used.
Ice Machines, < 500 lbs/day	1652	0.189	1652	0.189	1	1	FES-G7 deemed savings values were used correctly.
Ice Machines, > 1,000 lbs/day	6048	0.690	6048	0.690	1	1	FES-G7 deemed savings values were used correctly.
VFD	1,467 / hp	0.130 / hp	1,472 / hp	0.143 / hp	11, total of 132.5 hp	11, total of 132.5 hp	Corrected to SC Measures database deemed savings values.
Split/Unitary Systems	Savings varies by size. Please refer to Table 6				34, total of 137.5 tons	34, total of 137.5 tons	Corrected to SC Measures database deemed savings values.
Chiller, Air-Cooled	497/ton	0.179/ton	307/ton	0.158/ton	1 @ 130 tons	1 @ 130 tons	Corrected to SC Measures database deemed savings values.
Chiller, Water-Cooled Centrifugal	259/ton	0.010/ton	180/ton	0.023/ton	1 @ 800 tons	1 @ 800 tons	Corrected to SC Measures database deemed savings values using interpolation.
Convection Ovens	2,262	0.500	2,262	0.500	1	1	FES-F5 deemed savings values were used correctly.

Table 50. Comparison of Energy and Demand Savings for Split and Packaged Equipment

size	Original deemed values		Tracked savings	
tons	kWh/ton	kW/ton	kWh/ton	kW/ton
<5.4 1 phase	114	0.076	172.0	0.114
< 5.4 3 phase	86	0.057	172.0	0.114
< 11.25	118	0.079	104.9	0.070
<20	209	0.140	69.7	0.047
< 63	109	0.073	132.4	0.089
> 63	161	0.108	n/a	n/a

Lighting Measures

Site monitoring and verification work was carried out for ten different lighting projects. The verified savings for these projects was included in the verified results for the C&I program. These M&V projects include three that installed new T8 lighting; one with new high-bay lighting; two with new CFLs; and five schools, one office building, and one parking garage with new occupancy sensors to control lighting. Overall, the verified energy savings for these ten projects was found to be 45% greater than what was tracked, and the demand savings were 62% greater.

At each site, we verified the type and number of new fixtures installed, and gathered as much information as possible to determine the baseline fixture conditions. We also measured the lighting operating hours using time of use meters. By metering a random sample of fixtures at each site, we were able to determine lighting hours of use and measure concurrent use of light fixtures.

Updated values of fixture quantities, wattages, total hours of use, and coincident hours of use were used to find the evaluated energy and demand savings for these ten projects. The table below lists the evaluated savings and compares them to the tracked savings for each project. Project realization rates were found for both energy and demand savings. The energy realization rates ranged from 0.78 to 4.16, and the demand realization rates were between 0.81 and 3.55. The weighted overall realization rates for all ten projects are 1.45 for energy savings and 1.62 for demand savings.

We found three reasons for these savings discrepancies. First, the tracked fixture wattages did not accurately represent their actual wattages. Second, we found that the hourly reductions due to the use of lighting controls were much higher than expected. The program assumes a 25% reduction in operating hours, but we found a 78% reduction in a parking garage, and an average reduction of 50% in the five schools we monitored. Third, we also found that the lighting controls reduce demand by 40% to 60% in the schools and parking garage we monitored, instead of by just 25% as assumed by the program.

3.10 Commercial Energy Information Display

The Energy Information Display (EID) program initiated a commercial EID program on a pilot basis. The goal of this program was to test the effectiveness of providing EID technology to commercial customers in PY1 and to see if the technology might benefit small commercial customers. Because this program was launched on a pilot basis, the Commercial Energy Information Display program was not included in SCE&G's original forecast planning for this portfolio and did not claim savings. For this reason, we do not attempt to estimate energy savings from commercial customers as part of this pilot.

To goal of the evaluation was to help SCE&G determine whether the program was viable for small commercial customers and whether it should continue as part of the portfolio. Evaluation results, described in more detail below, indicated that this device was not well suited to small business customers and showed little evidence of potential energy savings.

Similar to the residential EID program, the commercial EID initiative provided discounted energy information displays to SCE&G customers to increase awareness of energy consumption in their businesses. SCE&G administrated this program in-house with customer service support provided by its EnergyWise Contact Center group. The EIDs provide near real-time feedback on energy usage in customers' businesses. Based on the program theory, this feedback increases customer awareness of their energy use and thus prompts action to conserve energy or invest in energy efficiency upgrades.

During the Phase 1 program, which began in November 2010, 44 small commercial customers received an AzTech in-home display device free of charge.

Two surveys were conducted to gauge the success of the Commercial EID program. An initial survey was conducted in January-February 2011 (73% response rate, n=32) and a follow up survey in April 2011 (62% response rate, n=26). Since the second survey was conducted at a later stage in the program, and since its results are similar to the first, the results of the second survey will be cited here unless otherwise noted. All commercial participants were provided AzTech devices during Phase 1 of the program. In addition to the surveys, a set of in-depth interviews was also conducted during June 2011 with 16 of the 40 participants enrolled at that time.

Both the surveys and in-depth interviews found that the commercial program was not as useful to business customers as residential customers. Specifically, our findings indicated the following:

- Opinions were mixed regarding the usefulness of the information displayed by the device, with 35% (n=11) describing it as "very useful", 54% (n=16) as "somewhat useful", 16% (n=5) as "not at all useful").
    - This lack of usefulness appeared to be related to a lack of control over the electrical usage of the business. Though most participants reported being the only occupant in a standalone building (January-February 2011 - 59%, n=19), only 50% (n=13) of businesses said that they had full control of their electricity usage. The number of participants who felt as if they had significant control over electricity use fell further when participants were asked about specific measures. When asked if they had control over lighting usage, less than half responded that this was within their control (38%, n=10). Less than a third reported control over heating or cooling (31%, n=8), and less than one fifth reported control over electronics or appliances (19%, n=5).

- Our in-depth interviews revealed three primary participant groups: Engaged (50%, n=8) Not Engaged (19%, n=3), and Not Working (31%, n=5).
    - While engaged customers found the device useful and were interested in the information, the Not Engaged liked the concept of the device, but had difficulty using it
    - Those in the Not Working category either had a faulty device or never successfully installed it.

- The in-depth interviews which we conducted with 16 of the then active pool of 40 participants revealed that, of the three primary participant groups described previously (Engaged, Not Engaged, and Not Working), only about half of those who were classified as Engaged could be considered to also be Active (i.e., taking significant action). These findings indicate that, though many businesses find the information interesting and useful, few are both willing and able to take concrete steps towards increasing energy efficiency based on the device.

- Just two-thirds (62%, n=15) say that they have made at least some change in their energy use as a result of what they have learned from the display.

The commercial program efforts were not continued in Phase 2 due to relatively low levels of installation and engagement with the device (as compared to residential) and increased offerings to commercial customers due to new meter installations.

A. ORIGINAL VERSUS PHASED IN PROGRAM FORECASTS

The evaluation team revised the original forecasts for net energy and demand savings, costs and participation numbers in the planning model for PY1 based on the actual number of months the programs were implemented for all programs.

Table 51. Revised Net Forecasts for PY1

	MWh orig.	MWh revised	MW orig	MW revised	Cost Orig	Cost Revised	Participation Original	Part Revised
Home Energy Reports	8,250	6,187	3.02	2.27	$547,500	$472,500	25,000	18,750
Energy Information Display	1,662	1,247	0.27	0.20	$707,155	$583,527	4,156	3,117
Home Energy Check-up	492	492	0.10	0.10	$396,421	$396,421	1,367	1,367
ENERGY STAR Lighting	24,373	18,280	3.15	2.36	$3,343,171	$2,828,613	N/A	767,688
Heating & Cooling and Water Heating	7,006	5,255	1.65	1.24	$2,887,749	$2,509,763	5,390	4,043
Heating & Cooling Efficiency Improvement	3,755	2,816	1.72	1.29	$1,350,978	$1,177,231	6,576	4,932
ENERGY STAR New Homes	225	169	0.08	0.06	$292,750	$274,000	250	188
Home Performance w ENERGY STAR	1,758	1,319	0.38	0.29	$1,640,361	$1,384,055	683	512
Commercial and Industrial Prescriptive	36,327	36,327	3.47	3.47	$2,941,028	$2,941,028	374	374
Commercial and Industrial Custom	19,029	15,857	2.87	2.39	$2,238,079	$1,865,066	105	88
Total	**102,877**	**87,949**	**16.71**	**13.66**	**$16,345,192**	**$14,432,203**		

Table 52. Number of Implementation Months Used to Revise Original Forecasts

Program Name	Months
Home Energy Reports	9
Energy Information Display	9
Home Energy Check-up	12
ENERGY STAR Lighting	9
Heating & Cooling and Water Heating	9
Heating & Cooling Efficiency Improvement	9
ENERGY STAR New Homes	9
Home Performance w ENERGY STAR	9
Commercial and Industrial Prescriptive	12
Commercial and Industrial Custom	10