A decorative graphic on the left side of the page consists of a large diamond shape formed by a series of smaller diamond-shaped images. These images include: a green leaf with water droplets, a water droplet hitting a surface creating ripples, a landscape with mountains and a lake, a close-up of a green leaf, a landscape with a river and mountains, a close-up of a green leaf, a water droplet hitting a surface, a landscape with a river and mountains, a close-up of a green leaf, a water droplet hitting a surface, a landscape with a river and mountains, and a close-up of a green leaf.

Heating and Air Conditioning Electric Program – PY3 Evaluation

February 2012

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1. Executive Summary

The Ameren Illinois Heating and Cooling Equipment (Heating and Cooling) Program and Warm Neighbors Cool Friends (WNCF) Program offer incentives to heating and cooling contractors to encourage the purchase of energy-efficient central air conditioners (CAC), air source heat pumps (ASHPs), ground source heat pumps (GSHPs), gas furnaces, and gas boilers. These programs also included incentives for right-sizing cooling units according to Air Conditioning Contractors of America (ACCA) Manual J through February 12, 2011. The Manual J sizing incentives were discontinued after that point due to the low realization rate estimated as part of the Program Year 2 (PY2) evaluation. The Cadmus Group Inc.'s (Cadmus') evaluation of Program Year 3 (PY3) consisted of reviewing and analyzing the tracking database for these programs and applying savings estimates based on past PY1 and PY2 evaluation activities. We also confirmed our engineering model with data from a sample of metered sites. We confirmed program design and PY3 changes through a stakeholder interview. Sources of savings estimates are displayed in Table ES-1. This report presents the electric savings induced by the program. Gas results are reported separately.

Table ES-1. Savings Estimate Sources

Savings Estimate	Source
CAC	Heating and Air Conditioning Electric Program Evaluation, PY2 Report, dated February 2011. Pages 14-19 summarize the gross savings analysis based on ENERGY-10 engineering simulation modeling using Ameren Illinois specific inputs.
ASHP	Heating and Air Conditioning Electric Program Evaluation, PY2 Report, dated February 2011. Pages 14-19 summarize the gross savings analysis based on ENERGY -10 engineering simulation modeling using Ameren Illinois specific inputs.
GSHP	ENERGY-10 energy simulation model results, confirmed by monitoring results from GSHP sites in Ameren Illinois area (n=9).
Net-to-gross ratio	Participating Customer Surveys (n=150), Participating (n=30) and Nonparticipating Contractor Surveys (n=20) using primary data collected in Ameren Illinois service area.

During PY3, the Warm Neighbors Cool Friends pilot program offered incentives targeted to middle income customers who are 200% to 300% of the federal poverty level. The WNCF pilot was administered as part of the Home Energy Performance Program. Heating and Cooling equipment incentivized through WNCF were counted and paid through the Program. The Ameren Illinois incentives were combined with grants provided by the Energy Assistance Foundation. The program allowed participants to install energy-saving measures in their homes while paying only \$500 or 10 percent of the project costs, whichever was higher. Results for the program pilot are included in the savings analysis of the PY3 Heating and Cooling Program. In PY4 the pilot will be rolled out as an independent offering. Conservation Services Group (CSG) implements the program on behalf of Ameren Illinois.

Evaluation Findings

Gross Impact

A summary of the gross impact evaluation findings is presented in Table ES-2 below. We estimated the per unit savings, using the ENERGY-10 energy simulation model to predict energy

consumption of a home using data input from actual PY3 program installations and home size information from the PY2 survey of program participants. In the PY3 evaluation, ENERGY-10 models were expanded to include energy-efficient gas boilers; however, this does not affect the electric savings discussed in this report.

Table ES-2. Program Gross Savings

Measure	Heating and Cooling Installations	WNCF Pilot Installations	Realized Gross Energy Savings (MWh)	Realized Gross Demand Savings (kW)
Early Replacement ASHP Cooling and CAC	7,809	24	11,845	8,687
Replacement at Burnout ASHP Cooling and CAC	1,699		634	465
Manual J Sizing	3,441	7	339	248
Subtotal of ASHP Cooling and CAC			12,818	9,401
GSHP Heating and Cooling	417		1,314	171
ASHP Heating	730		3,652	476
Subtotal of Heating and GSHP Heating and Cooling			4,966	648
Total - PY3			17,783	10,048

Gross *ex ante* savings estimates submitted in the PY3 database had not been revised to reflect PY2 evaluation outcomes, resulting in differences between *ex ante* gross savings and realized gross savings, similar to those seen in the previous evaluation. The reduction in gross savings was driven primarily by lower realized unit savings estimates for early replacement, Manual J sizing, and GSHP. Those reductions in savings were offset somewhat by the additional savings from ASHP heating – which were not included in the original savings estimates found in the 2008-2010 Ameren Residential Programs, Residential Heating and Cooling Program PY2 Implementation Plan.

Net Impact

Cadmus used three surveys in performing analysis for freeridership and spillover:

- 1) Participating contractor surveys
- 2) Nonparticipating contractor surveys
- 3) Participating consumer surveys

The NTG ratio was calculated according the following formula:

We analyzed freeridership using five different methods, considering the views of contractors and participants. After reviewing and comparing the results of each method, we chose the results from the participant customer survey as being the most valid to estimate freeridership, which had a value of 60 percent.

We also estimated spillover from two sources:

- 1) Additional energy-efficiency purchases by customers who received a program incentive. These additional energy-efficiency purchases had to be: a) strongly influenced by the customer's participation in this program, and b) not incentivized through another Ameren Illinois program. This spillover was estimated through the participating customer survey. This spillover amount from the electric HVAC measures installed, included a variety of measures savings both gas and electricity. Therefore spillover was calculated in BTUs and estimated at 13 percent of program savings.
- 2) From customers who purchased energy-efficiency HVAC equipment through a nonparticipating contractor. This might have occurred because a number of nonparticipating contractors originally signed up for the program then dropped out, but are still promoting the higher efficiency units to their customers. We interviewed these "drop out" contractors to compare their estimates of high efficiency market shares with and without the program. The result was an additional 6 percent of program savings.

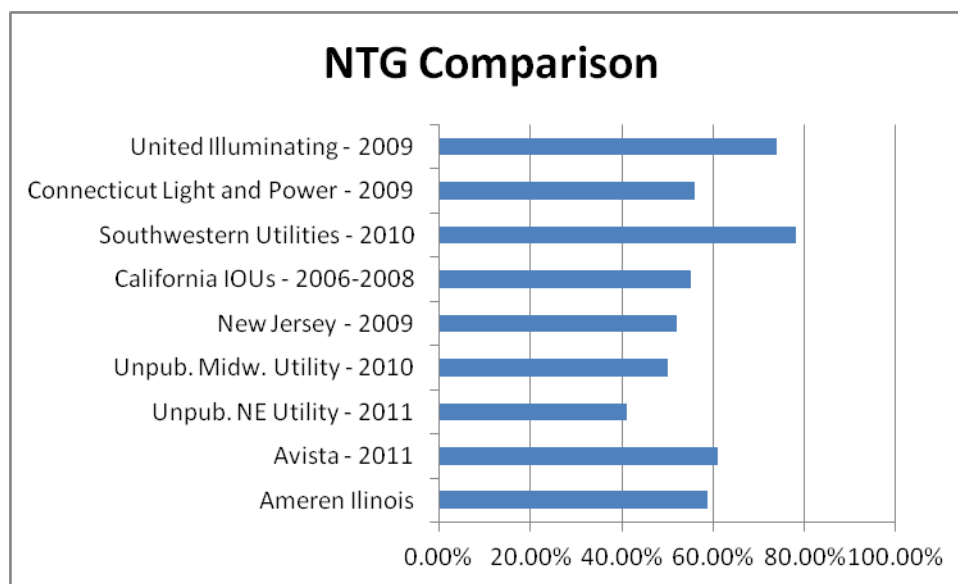
Combining freeridership and spillover resulted in a total NTG of 59 percent.

Table ES-3 summarizes the program's *ex ante* gross savings, realized gross savings, the realization rate, and net savings. After revising unit savings values for all the measures, Cadmus estimated realized gross energy and demand savings at 17,783 MWh and 10,048 kW and net energy and demand savings at 10,492 MWh and 5,929 kW.

Table ES-3. Ex Ante Gross Savings, Realized Savings, and Net Savings

Measure	Ex Ante Gross Savings (MWh)	Realized Gross Savings (MWh)	Realization Rate	NTG	Net Energy Savings (MWh)	Net Demand Savings (kW)
Early Replacement ASHP Cooling and CAC	19,097	11,845	62%	0.59	6,989	5,125
Replacement at Burnout ASHP Cooling and CAC	510	634	124%	0.59	374	274
Manual J Sizing	5,517	339	6%	0.59	200	146
Subtotal of ASHP Cooling and CAC	25,123	12,818	51%	0.59	7,563	5,547
GSHP Heating and Cooling	4,087	1,314	32%	0.59	775	101
ASHP Heating	-	3,652	-	0.59	2,155	281
Subtotal of Heating and GSHP Heating and Cooling	4,087	4,966	122%	0.59	2,930	382
Total - PY3	29,210	17,783	61%	0.59	10,492	5,929

Cadmus compared the NTG results to those found in other similar programs. Figure ES-1 indicates the Ameren Illinois results are similar to those found elsewhere.

Figure ES-1. NTG Comparison

Process Evaluation Findings

Heating and Cooling Program participation continued to be high even as federal and state incentives ended. The interviewed stakeholders considered the program successful in terms of the number of installations performed. With the end of federal incentives, program managers were concerned that participation would decrease. Participation spiked at the end of December 2011 concurrent with the large reduction in federal tax credits. This resulted in an abnormally busy January and February for installations. Participation did briefly slow down in early spring; however, it recovered during the normal peak replacement period. Increased marketing efforts contributed to higher participation in the program.

Heating and cooling allied contractor interface with the program was improved.

To meet the challenges of increased program participation, CSG program administrators developed an on-line form so customers may reserve early retirement incentives.

Remove non-participant heating and cooling contractors

At the end of PY3, the Heating and Cooling Program had 563 active program contractors. During the year, CSG reviewed contractor records to determine whether any contractors were not active in the program. The review identified 175 contractors who had not installed incented measures but were listed as program contractors. Since early 2011, if a contractor has not submitted an incentive application for the prior 6 month period he is removed from the program ally list. CSG monitors application activity on a monthly basis.

Additional Incentives and Program Pilots

To continue growth in the Heating and Cooling Program, Ameren Illinois introduced new incentives for energy-efficient gas boilers in PY3, as well as the WNCF pilot program.

Recommendations for Future Actions

- **Revise ex ante gross savings per unit estimates.** Gross savings estimates, submitted in the PY3 database were not revised to reflect PY2 evaluation outcomes, resulting in differences between *ex ante* gross savings and realized gross savings, as seen in the previous evaluation.
- **Integrate databases.** The current standalone program database should be integrated into CSG's Core Application database, so it can be linked to other residential programs included in CSG's database. The rebate application should be a single form for both gas and electric units. Both of these changes will help link gas and electric customer account information more effectively.
- **Collect more information on existing and new equipment.** Additional data must still be collected to quantify all benefits resulting from the Heating and Cooling program. Existing heating capacity information for ASHP and GSHP installations should be collected to allow Ameren to quantify and claim all energy savings resulting from heating benefits. While we found make and model information in the database for existing units, it was unclear whether the data were input correctly as we found the new unit make and model data were sparsely populated. This did not affect PY3 savings estimates since we applied PY2 savings to the participant counts for PY3. However, future evaluations will need to have full information on both old and new units. Finally, there should be a way to indicate (possibly through a check-off box) whether the heat pump will be used for heating, cooling or both and whether the existing heating system will also be used.
- **Consider higher customer incentives for higher efficiency replacement products.** The current incentive structure, which pays \$600 for the purchase of any high efficiency unit replacing a unit of SEER 10 or less, pays more than one-half of the incremental cost of a SEER 14 central air conditioner, but less than a third of a SEER 16 central air conditioner. In Cadmus' experience, measure proportion of freeridership is inversely proportional to the percentage of incremental cost paid. Paying higher incentives for the highest efficiency products should lower the overall rate of freeridership, however in scenarios of limited budget this must be balanced against other savings opportunities.
- **Consider incorporating contractor incentives for meeting specific targets.** An example might be to offer a bonus to contractors who achieve a certain level of energy efficiency sales. According to our contractor surveys, participating contractors sell high efficiency central air conditioner units 58 percent of the time and high efficiency ASHPs 66 percent of the time. Consider offering contractors bonuses if they achieve a higher percentage of energy efficiency sales (such as 80 percent).
- **Consider eliminating or restructuring GSHP incentives.** Since the incremental cost of GSHP units is greater than \$10,000, the \$600 incentive currently offered is not likely to be the motivating factor to convince customers to purchase a unit. When Cadmus analyzed freeridership in this evaluation using different approaches, GSHPs consistently had the highest freeridership levels. We recommend either eliminating this measure or

designing the eligibility requirements and incentives to encourage the purchase of units that would not otherwise occur.

2. Introduction

Ameren Illinois' Heating and Cooling Equipment Program (Heating and Cooling Program) is implemented by Conservation Services Group (CSG). The program offers incentives to heating and cooling contractors to encourage the purchase of energy-efficient central air conditioners (CAC), air source heat pumps (ASHPs), ground source (geothermal) heat pumps (GSHPs), gas furnaces, and gas boilers. For new equipment an incentive is provided to persuade Ameren Illinois customers to install more efficient equipment than they might normally install. For working equipment, the early retirement portion of the program encourages customers to retire a still working very inefficient piece of equipment for a newer more efficient unit. The program provides incentives for heating and cooling contractors to pass through to consumers, rather than requiring them to apply for a rebate. The baseline efficiency conditions for new heating and cooling systems are the applicable federal equipment standards. In addition, as historically, air conditioning systems tend to be oversized relative to the cooling load, the program provided a right sizing incentive based on Air Conditioning Contractors of America (ACCA) Manual J, which was discontinued in February after the PY2 evaluation determined a low realization rate.

Ameren Illinois began offering these the incentives in Program Year 2 (PY2). Since then, the program has recruited 731 heating and cooling contractors, 563 of which are currently active. This report covers the program's second year (overall PY3). Program participation increased as additional contractors were recruited into the program, from 7,352 electric incentives provided in PY2 to 14,096 incentives provided in PY3.

Beginning in PY3 Ameren Illinois launched a pilot program, Warm Neighbors Cool Friends (WNCF). The pilot offered incentives targeted to middle income customers who are 200% to 300% of the federal poverty level. The WNCF pilot, administered as part of the Home Energy Performance Program, combined the HVAC incentives with grants provided by the non-profit Energy Assistance Foundation. The program allowed participants to install energy-saving measures, including central air conditioners, gas furnaces, and boilers in their homes while paying only \$500 or 10 percent of the project costs (whichever was higher). The pilot will be launched as a new full-scale program during PY4. Results for the heating and cooling incentives from the program pilot are included in the PY3 evaluation of the Heating and Cooling Program.

Ameren Illinois provided the first incentives for high-efficiency HVAC equipment replacements and installations in June of 2009.

The HVAC program works as follows:

- Customers contact and schedule an appointment with an approved contractor.
- The contractor provides recommendations based on existing equipment installed in the residence and the residents' preferences.
- For early retirement installations, the contractor contacts CSG account managers to confirm the existing and replacement units' eligibility for incentives using Preston's

Guide¹ and obtain a reservation, if necessary, for an incentive within 48 hours of the request. CSG completes an on-site audit to verify eligibility of existing units.

- The contractor provides an estimate of installation/replacement costs and incentives available.
- The contractor completes installation and submits the following information to CSG:
 - Furnaces and Boilers: manufacturer, model, BTU/hr input, AFUE rating of the new unit, and the fuel type and unit installation year (range) of the existing unit.
 - Cooling Equipment: system type, Air-Conditioning, Heating, and Refrigeration Institute (AHRI) number, cooling capacity (tons), efficiency of the new unit; and the system type, age, cooling capacity, efficiency, manufacturer, and model of the existing unit.
 - Invoice with the program incentive clearly listed and subtracted from the total cost.
- After the installation is complete, the contractor submits the signed incentive application and invoice to CSG for approval and reimbursement. Invoices should show the incentive markdown and customer's electric or gas account number.
- CSG reviews and verifies the incentive application and supporting documentation and provides reimbursement to the contractor, typically within two weeks.
- For selected systems, CSG completes an on-site audit to verify the work was completed as described in the submitted application.
- CSG inputs all data from the incentive application into its tracking system.
- CSG invoices Ameren Illinois monthly for the cost of the program, including incentive money provided to the contractors.

Ameren Illinois increased direct marketing activities during PY3, including placing advertisements in newspapers, home and regional magazine publications, and radio. They also continued to utilize the established marketing networks of heating and cooling contractors. Two CSG account managers, located in the northern and southern sections of the service territory, serve as primary contacts for contractors. They host informational meetings and participate in regional trade shows to increase visibility. Contractors are supplied with marketing materials and brochures. Contractors are required to submit documentation of insurance and W-9 forms, but no additional certification is necessary. At the end of PY3, the Heating and Cooling Program had 563 active contractors on record. Incentives available for the Heating and Cooling and WNCF Programs in PY3 are included in Table 1.

¹ Preston's Guide lists original manufacturer HVAC specifications for air conditioners, heat pumps, and gas and oil furnaces by model number.

Table 1. Incentive Amounts

Program	Action	Incentive	Details
Heating and Cooling	Early Replacement ASHP Cooling and CAC	\$600	Replacing a working central air conditioner (CAC) or air source heat pump (ASHP) with a seasonal energy efficiency rating (SEER) of 10 or less with a new efficient unit
Heating and Cooling	GSHP Heating and Cooling	\$600	Installing a new ground source heat pump (GSHP)
Heating and Cooling	Manual J Sizing	\$120	Correctly sizing new GSHP, CAC, or ASHP based on Manual J specifications
Heating and Cooling	Replacement at Burnout ASHP Cooling and CAC	\$110	Replacing a working CAC or ASHP with a SEER greater than 10 (or any non-working CAC or ASHP) with a new efficient CAC or ASHP
Heating and Cooling	New Gas Furnace (95% AFUE)	\$200	Installing a new gas furnace with a Department of Energy's annual fuel utilization efficiency (AFUE) rating of 95% or greater
Heating and Cooling	New Gas Furnace (92% AFUE)	\$125	Installing a new gas furnace with an AFUE rating of 92% or greater
Heating and Cooling	New Gas Boiler (90% AFUE)	\$500	Installing a new gas boiler with an AFUE rating of 90% or greater.
WNCF	Early Replacement CAC	\$600	Replacing a working central air conditioner (CAC) with a Seasonal Energy Efficiency Rating (SEER) of 10 or less with a new efficient unit
WNCF	Manual J Sizing	\$120	Correctly sizing new CAC based on Manual J specifications
WNCF	New Gas Furnace (95% AFUE)	\$200	Installing a new gas furnace with AFUE rating of 95% or greater
WNCF	New Gas Boiler (90% AFUE)	\$500	Installing a new gas boiler with an AFUE rating of 90% or greater.

For the PY3 evaluation, Cadmus conducted stakeholder interviews and reviewed the tracking database, and conducted a metering analysis of the winter use of ground source heat pumps. In addition, we surveyed participating and non participating contractors to provide input for the program net-to-gross ratio (NTG) and understand contractor satisfaction and market impacts from the program. For impact evaluation, this report focuses on electric savings only. Gas savings will be reported separately.

3. Evaluation Methods

Data Sources

The following data sources informed the impact and process evaluation:

- Final PY3 program database (provided by CSG)
- Information gathered through program manager interviews
- Information gathered through participating and non-participating contractor surveys
- Information gathered through a participants survey
- Data collected through metering
- PY1 and PY2 reports and analysis

Methodology

Stakeholder Interviews

Cadmus interviewed both the Ameren Illinois and CSG program managers to understand any changes made in the program from PY3, along with successes, challenges, and progress towards implementing recommendations made in PY2. The stakeholder interview guide is included in Appendix A.

Participating Contractor Surveys

Cadmus surveyed a sample of 30 contractors to assess their views on the impact of the program on high-efficiency heating and cooling equipment sales. We also asked about their satisfaction with the program and past promotions of energy efficiency. To prepare the sample, we stratified the contractor database of 731 into four equally sized initial strata based on the number of projects earning incentives that each contractor sold. The bottom stratum was eliminated since its participation was limited to only a few or no incentives. The top stratum was further segmented into two: a new top stratum with the top 14 sellers, sorted randomly, of which we called five. The remainder of the contractors in the initial stratum became the new second stratum tier containing 124 high sellers, sorted randomly, of which we called ten. A list of 138 contractors in the next lower stratum was also sorted randomly, and ten were contacted. The lowest remaining stratum contained 137 members, who had the lowest sales of those remaining, and five were called. Results were weighted by number of incentives paid to each contractor. The participating contractor survey is included in Appendix B.

Nonparticipating Contractor Surveys

Cadmus surveyed a random sample of 20 contractors out of 165 who had recently been removed from the ally list due to non-participation. Any contractor not submitting an application for the previous 6 months is removed from the list. The survey asked questions about average efficiency levels of equipment sold and whether the contractor perceived increased sales of equipment due

to the program (and without the incentives). Results from the survey are used to estimate free-ridership and spillover. The nonparticipating contractor survey is included in Appendix C.

Participating Customer Surveys

Cadmus surveyed a random sample of 150 participating customers, 30 of each technology type. The survey asked about how customers found out about the program, how influential the discount was in their decision to purchase the efficient equipment, whether they were aware of the tax credits and whether the program caused them to purchase additional energy efficiency equipment. Results from the survey are used to estimate free-ridership and spillover. The participating customer survey and responses to demographic questions are included in Appendix D.

Metering Analysis

Cadmus metered ten homes with GSHPs, two residences with ASHPs, and 19 residences with CACs installed. The purpose of the metering was to validate the energy consumption estimates for these measures estimated through the ENERGY-10 software.² Meters were installed in June 2010 and removed in October 2010 at the end of the cooling season for ASHPs and CACs. Meters installed at GSHPs were removed in April 2011 at the end of the heating season.

Impact Calculations

For the PY2 evaluation, Cadmus used ENERGY-10 software to calculate energy savings. In PY3, we used the same simulation model based on typical participant home characteristics. In Table 2 we compare the predicted energy consumption from ENERGY-10 to metered data to validate our simulation model results. Since we metered only a small sample of homes for each measure, some differences are to be expected due to sampling error, and differences in home characteristics not captured in the model. We weather adjusted the metered data using a ratio of average³ heating degree days (HDD) or cooling degree days (CDD) for Springfield, Illinois, to the values that occurred during the metering period. Because 2010 was a very hot summer, the metered cooling data were decremented by 21% to align in with the modeling which was based on long term weather data. This difference in actual weather plus differences in home characteristics (due to the small metering sample) are likely contributors to the difference between modeled results and metered results. Due to the small sample size, and significantly different weather affecting the metered results, Cadmus did not revise our engineering modeled savings estimates. We recommend additional metering, with a larger sample size for future evaluations.

² ENERGY-10 software is a home energy simulation tool that analyzes—and illustrates—the energy and cost savings achievable through different energy-efficient design strategies. Hourly energy simulations quantify, assess, and depict energy savings from measures such as daylighting, passive solar heating, natural ventilation, well-insulated envelopes, better windows, lighting systems, and mechanical equipment.

³ The average HDD and CDD were based on actual weather from 1971 through 2006.

Table 2. Comparison of ENERGY -10 Simulation to Weather-Adjusted Metered Consumption

Measure	ENERGY-10 kWh/yr	Metered kWh/yr	# Sites Metered	% Difference
ASHP and CAC Cooling	2,341	1,514	16	-35%
GSHP Cooling	3,032	2,076	9	-32%
ASHP Heating	13,559	-	0	
GSHP Heating	9,567	9,178	8	-4%

4. Program Results

Impact Findings – Gross Savings

The total *ex ante* gross energy and demand savings based on program participation were 29,210 MWh and 18,959 kW. After revising unit savings values for all the measures for an overall realization rate of 61 percent, realized gross energy and demand savings were estimated at 17,783 MWh and 10,048 kW (See Figure 1 below).

Ex ante energy savings estimates used in the PY3 tracking database were not revised to reflect outcomes from the PY2 evaluation. As such, realization rates for the PY3 evaluation are similar to those found in the PY2 evaluation. The reduction in gross savings for both PY2 and PY3 evaluations was driven by lower realized per unit savings estimates for early replacement and Manual J sizing of heating and cooling equipment. Those reductions in savings were offset somewhat by the additional savings from ASHP heating –which were not included in the original savings estimates found in the *2008-2010 Ameren Residential Programs, Residential Heating and Cooling Program PY2 Implementation Plan*.

Figure 1. PY3 Heating and Cooling Program Ex Ante and Realized Gross Energy Savings

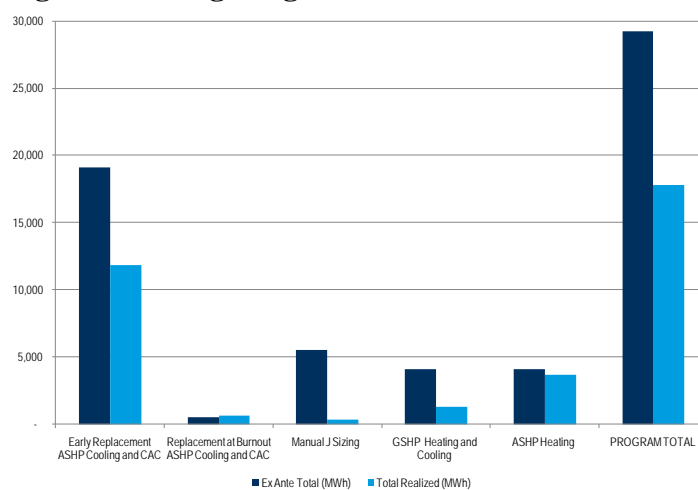


Table 4 shows greater detail on the manner in which gross savings were calculated. For each measure, Table 4 includes the following information on gross savings:

- **The number of installations** based on the PY3 Heating and Cooling database figures.
- **Ex Ante Per Unit (kWh)** are unit savings found in the *2008-2010 Ameren Residential Programs, Residential Heating and Cooling Program PY2 Implementation Plan*.
- **Realized Per Unit (kWh)** are unit savings established by Cadmus using various energy calculations and the ENERGY-10 simulation model for heating and cooling (see Evaluation Methods for more detail).

Table 3. Coincidence Factors

Unit	Coincidence Factor*
HVAC	0.0007334205
Heat Pumps	0.000130413
*The Cadmus Group Inc: Ameren Illinois Utilities Portfolio Cost-Effectiveness Evaluation, December 30, 2009.	

Table 4. PY3 Electric Energy and Demand Gross Savings for Heating and Cooling Program

Measure	Annual Gross Savings						
	Units Installed	Ex Ante Per Unit Energy Savings (kWh)	Realized Per Unit Energy Savings (kWh)	Ex Ante Total Energy Savings (MWh)	Ex Ante Total Demand Savings (kW)	Total Realized Energy Savings (MWh)	Total Realized Demand Savings (kW)
Early Replacement ASHP Cooling and CAC	7,833	2,438	1,512	19,097	14,006	11,845	8,687
Replacement at Burnout ASHP Cooling and CAC	1,699	300	373	510	374	634	465
Manual J Sizing	3,448	1,600	98	5,517	4,046	339	248
<i>Early Replacement ASHP Cooling and CAC</i>				25,123	18,426	12,818	9,401
GSHP Cooling Replace at CAC Burnout	417	NA	871	NA	NA	363	NA
GSHP Heating (Replaces ASHP)	113	NA	8,443	NA	NA	951	NA
GSHP Heating and Cooling	417	9,800	3,151	4,087	533	1,314	171
ASHP Heating (Replaces Electric Heat)	160	NA	11,652	NA	NA	1,861	NA
ASHP Heating (Replacement at ASHP Burnout)	176	NA	615	NA	NA	108	NA
ASHP Heating (Early Replacement ASHP)	394	NA	4,270	NA	NA	1,682	NA
ASHP Heating	730	NA	5,004	NA	NA	3,652	476
<i>Subtotal of ASHP Heating and GSHP Heating and Cooling</i>				4,087	533	4,966	648
Program Total				29,210	18,959	17,783	10,048

A number of conclusions can be reached when examining Table 4 regarding the *ex ante* and realized unit savings:

Ex ante per unit energy savings should have reflected evaluation results. Gross per unit energy savings estimates in the PY3 database are those listed in the *2008-2010 Ameren Residential Programs, Residential HVAC Program PY2 Implementation Plan*; these estimates have not been updated based on the PY2 evaluation results.

GSHP realized per unit gross energy savings from PY2 are accurate. Metering data collected and analyzed for the PY3 evaluation support energy consumption and savings estimates used in ENERGY-10 modeling conducted for the PY2 evaluation. For the PY2 evaluation, Cadmus completed ENERGY-10 GSHP modeling using much larger units than used for CAC and ASHP

(4.33 tons versus 3 tons) and modeling units placed in larger homes (2,645 square feet versus 1,700 square feet), based upon data collected during site visits at homes with GSHPs.⁴ Using the ENERGY-10 simulation models, GSHP unit cooling savings were established as 871 kWh assuming a SEER 13 baseline unit. GSHP unit heating savings were established as 8,443 kWh using an ASHP as baseline.

Impact Findings – Net Savings

Cadmus used three stakeholder surveys to provide input to the program NTG analysis:

- 1) Participating contractor surveys
- 2) Non-participating contractor surveys
- 3) Participating consumer surveys

The program NTG ratio was calculated according the following formula:

We attempted to assess freeridership using five different approaches:

- Method 1: Participant Self Report
- Method 2: Participating and Nonparticipating Contractor Comparisons
- Method 3: Participating Contractor Self Report for All Efficiency Levels
- Method 4: Participating Contractor Self Report for Highest Efficiency Levels
- Method 5: Price Elasticity

Based on our analysis, we determined the results from the Participant Self Report approach to be the more valid than the contractor surveys for determining program freeridership. This method is described in more detail below. The remaining methods are described and results are provided in Appendix F. Cadmus recommended contractor surveys for this evaluation because they had not previously been conducted as part of this program evaluation. We learned from the contractor surveys that they saw an impact on their business from the program and were happy to participate. However it was difficult for contractors to estimate the program's effect on their sales since other factors such as the economy and other incentives also affect sales. Additionally, contractors are focused on their total sales, and not necessarily the share of sales that are energy efficient.

We also estimated spillover from these sources:

- 1) Additional energy-efficiency purchases by customers who received a program incentive. These additional energy-efficiency purchases had to be: a) influenced by the customer's participation in this program, and b) not incentivized through another Ameren Illinois program. This spillover was estimated through the participating consumer survey.

⁴ Cadmus metered power usage of 10 GSHP units in AIU territory in the summer of 2010.

- 2) Spillover from customers who purchased energy-efficiency HVAC equipment through a non-participating contractor. This may have occurred because a number of non-participating contractors originally signed up for the program then dropped out, but are still promoting the higher efficient units to their customers. We interviewed these “drop out” contractors to assess how many additional high efficient units were sold due to Ameren Illinois’ program.⁵

Freeridership

Method 1 - Participant Self-Report

Method 1 is a participant self-report approach based on a standard battery of questions that define: 1) whether the participant would have purchased the same product without the incentive, and if so, 2) whether the participant would have purchased the product at the same time without the survey. For this program, participants may not have been aware of the incentive prior to purchasing, but if the contractor significantly influenced their purchase we do not consider them to be a freerider since the program encourages contractors to promote high efficiency equipment. We then apply a freerider score, ranging from zero to 100 percent, to each participant based on their responses to a set of survey questions. Appendix E describes our freeridership scoring approach for pertinent questions in the survey.

Cadmus stratified the survey sample by the three measure types: central air conditioning (3,836 participants), air source heat pumps (524 participants), and ground source heat pumps (185 participants). We interviewed 30 to 36 customers in each stratum. One possible downside of a self-report survey is the “halo effect” where individuals might report they would have done “the right thing” even without the program or alternatively feel guilty for taking money when they would have done it anyways. Therefore, the results of this method may have possible bias.

After conducting participant surveys, Cadmus converted resulting responses into a freeridership score for each participant, using the Excel-based matrix approach described in the freeridership methodology section in Appendix E. Each participant’s freerider score was derived by translating responses into a matrix value, and then using a rules-based calculation to obtain the final score. In this section, we present all combinations of responses we received for the HVAC program, and the scores assigned to each combination.

Table 5 shows the results of freeridership calculations for the HVAC program measures. Overall, the program had an average freeridership of 60 percent across all 96 respondents.

⁵ We first asked non-participating contractors to tell us the percentage of product sales that were higher efficiency. We then asked them whether they believe the program influenced that share. Of those who said “yes”, we asked the following question: You said you sold [%] of high efficiency [product name], what percentage of [product name] do you think would be high efficiency without the Ameren Illinois program?” The contractor provided his or her estimate of the net increase in high-efficiency sales.

Table 5. HVAC Freeridership Results By Measure

Measure	N	FR	NTG Including Spillover*
Air Source Heat Pump	30	61%	0.52
Central Air Conditioner	30	57%	0.56
Ground Source Heat Pump	36	76%	0.37
Program Total	96	60%*	0.59

* Program level estimate is weighted by measure kWh savings.

* Spillover is described in the next section of this report.

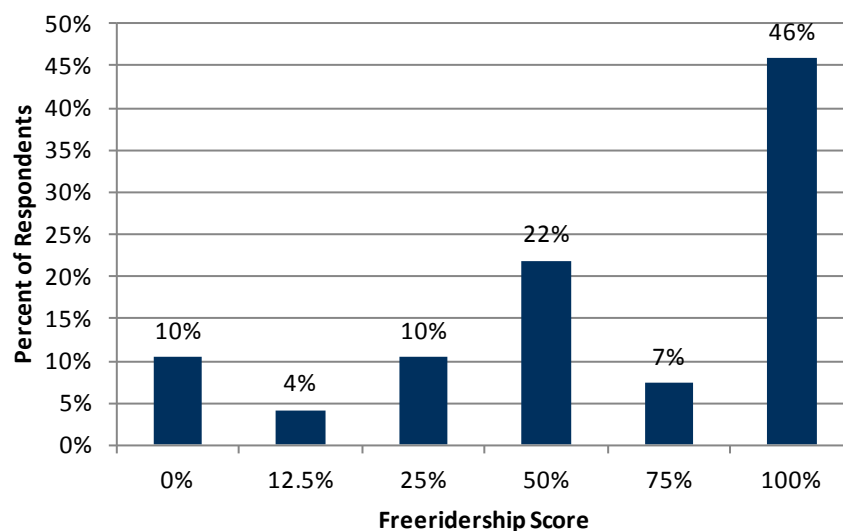
Table 6 shows the unique response combinations from the HVAC participant survey; the freeridership score assigned to each combination; and the number of responses for each combination. Table 6 indicates that participant responses tended to group around a subset of common patterns. Freeridership scores were calculated for each measure category, based on the distribution of scores within the matrix.

Table 6. Frequency of Freeridership Scoring Combinations

C1. Now I have a few questions about the energy efficient equipment installed in your home. Were you planning to purchase a new [MEASURE] before you heard about the program?	C2. At the time you first heard about the Ameren discount for an energy efficient [MEASURE], had you already installed your new equipment?	C3. If the [INCENTIVE] had not been available, would you have purchased exactly the same [MEASURE]?	C4 [ASK IF C3=1] Help me understand, when you say you would have purchased the same [MEASURE], would you have purchased one that was just as energy efficient?	C5. Would you have installed the system at the same time, earlier or later if the Ameren Illinois discount had not been available?	C6. [ASK IF C5=3] How much later would you have installed the system?	String	Free-Ridership Score	Frequency
Yes	Yes	x	x	x	x	YesYesxxxx	100%	3
No	Yes	x	x	x	x	NoYesxxxx	100%	2
Yes	No	Yes	Yes	Yes	x	YesNoYesYesYesx	100%	39
Yes	No	Yes	Yes	Partial	x	YesNoYesYesPartialx	75%	2
Yes	No	Yes	Yes	No	Yes	YesNoYesYesNoYes	50%	1
Yes	No	Yes	Yes	No	No	YesNoYesYesNoNo	0%	2
Yes	No	Yes	Partial	Partial	x	YesNoYesPartialPartialx	50%	2
Yes	No	Yes	No	x	x	YesNoYesNoxx	0%	1
Yes	No	Partial	x	Yes	x	YesNoPartialxYesx	75%	5
Yes	No	Partial	x	No	No	YesNoPartialxNoNo	0%	1
Yes	No	No	x	Yes	x	YesNoNoxYesx	50%	5
Yes	No	No	x	No	Yes	YesNoNoxNoYes	12.5%	2
Yes	No	No	x	No	No	YesNoNoxNoNo	0%	1
Partial	No	Yes	Yes	Partial	x	PartialNoYesYesPartialx	50%	1
Partial	No	Yes	Partial	Yes	x	PartialNoYesPartialYesx	50%	1
Partial	No	Partial	x	Partial	x	PartialNoPartialxPartialx	25%	4
Partial	No	No	x	Yes	x	PartialNoNoxYesx	25%	1
No	No	Yes	Yes	Yes	x	NoNoYesYesYesx	50%	11
No	No	Yes	Yes	Partial	x	NoNoYesYesPartialx	25%	1
No	No	Yes	Partial	Yes	x	NoNoYesPartialYesx	25%	1
No	No	Yes	No	x	x	NoNoYesNoxx	0%	1
No	No	Partial	x	Yes	x	NoNoPartialxYesx	25%	3
No	No	Partial	x	No	Partial	NoNoPartialxNoPartial	0%	1
No	No	No	x	Yes	x	NoNoNoxYesx	12.5%	2
No	No	No	x	No	Partial	NoNoNoxNoPartial	0%	1
No	No	No	x	No	No	NoNoNoxNoNo	0%	2

A common pattern appeared in the respondents’ answers to freeridership questions, representing 41 percent (39 out of the 96) of the total participants interviewed. Thirty-nine respondents answered that when they first heard of the HVAC program they had already been planning to purchase the measure and that without the Ameren HVAC incentive they would have purchased the exact same measure on their own. These respondents also indicated that they would have installed the measure to the same level of efficiency without the program incentive and they would have done it at the same time as they did through the program. Every answer from this group of respondents is indicative of freeridership and they are being scored as 100 percent freeriders.

Figure 2 shows a distribution of respondents by the freeridership score assigned to each. Approximately 10 percent of survey respondents were scored as 0 percent freeriders, while 14 percent of respondents are exhibiting low levels of freeridership (12.5% and 25%). Twenty-nine percent of respondents are showing moderate levels of freeridership (50% and 75%) while 46 percent of respondents are being scored as true freeriders (100%).

Figure 2. Overall Distribution of HVAC Freeridership Scores*

*Percentages shown in the figure add up to 99% due to rounding. Using unrounded numbers, the total is 100.0%.

Spillover

Cadmus estimated two different types of spillover:

- 1) Nonparticipating contractor spillover, based on the self-reported number of high-efficiency units sold and influenced by the program (without incentives).
- 2) Participating customer spillover, based on customers who purchased additional high-efficiency equipment or appliances due to their participation in the program.

Nonparticipating Contractor Spillover

Cadmus asked nonparticipating contractors if the program influenced their sales of high-efficiency equipment, and also asked them to quantify the percentage of sales lift due to the program. Since the nonparticipating contractors are defined as those that had not applied for any incentives in PY3, it is possible they promote high efficiency units more often but do not take advantage of the rebates. Nonparticipating contractors were asked to estimate how many of each measure type they sold during the first half of 2011, what percentage of them were high efficiency, and whether they think the program contributed to their sales of high efficiency units. Those who said “yes” were then asked what percentage of their sales they estimate would be high efficiency if Ameren Illinois did not have a program. For GSHP’s we just asked how many they would have sold without the program. These differences were multiplied by the percentage of respondents who reported a difference and multiplied by 175, the total number of inactive contractors. The result was incremental spillover sales, which was then multiplied by average savings per measure (assuming the same proportion as early replacement and replacement at burnout as occurred through the program). Number of sales, average savings per unit, and total spillover sales are shown in Table 7.

Table 7. Nonparticipant Contractor Spillover Sales

Measure	Spillover Sales	Average Savings Per Measure (kWh)	Incremental Spillover Sales (kWh)
Central Air Conditioner	368	1,320	485,091
ASHP	115	4,491	515,804
GSHP	22	3,159	69,101
Total			1,069,996

The spillover sales of 1,070 MWh equal 6 percent of the gross program sales of 17,783 MWh. Therefore adding in these spillover results increases the overall program NTG by 6 percent.

Participating Customer Spillover

We also asked participating customers to list any additional energy efficient items they have installed in their home since participating in the program. We also asked them to rate whether the program was extremely influential, somewhat influential, not very influential, or not at all influential. Only measures rated as being extremely influential by the program were counted. For each type of measure, we estimated energy savings either in comparison to federal standard efficiency using the ENERGY STAR calculator, or using savings estimates from the Home Energy Program as appropriate. We also eliminated any responses that were incentivized by another Ameren Illinois program.

Although we calculated electricity savings from the program, some spillover responses associated with electricity HVAC measures could have electric and gas savings depending on the fuel types used by the participant. Fuel type information was integrated into the analysis and therm savings were attributed to the program where appropriate. To combine kWh and therm savings from the spillover measures, we converted the spillover and program savings values to BTUs. The equation below is used to calculate the final spillover percentage estimate.

Table 8 contains the participant spillover analysis by measure installed through the program (the calculated spillover is from a variety of measures). Overall, the HVAC program has a participant spillover estimate of 13 percent.

Table 8. Spillover Percent Estimate by Program Installed Measure

Measure	Spillover BTU	Program BTU	Spillover % Estimate
Air Source Heat Pump	19,199,020	459,739,179	4%
Central Air Conditioner	33,325,143	135,127,080	25%
Ground Source Heat Pump	74,412,740	387,077,663	19%
Program Total	126,936,902	981,943,922	13%

Both program freeriders and non-freeriders may create program spillover. Cadmus uses separate questions, asked of all survey participants, for calculating freeridership and spillover. Cadmus found that ten (6.7%) respondents who were scored as 100 percent freeriders (out of 150 surveyed), six (4%) partial freeriders, and three (2%) non-freeriders produced spillover that was attributed to the program (they responded that the program was highly influential in their decision to install additional energy efficient equipment). We also found that 19 (13%) who were scored as 100 percent freeriders, 17 (11%) partial freeriders and four (2.5%) non-freeriders installed additional energy efficient equipment that was *not* influenced by the program.

Recommended NTG Ratio

By adding the freeridership and the two types of spillover, Cadmus calculated a program NTG of 0.59 with 90 percent confidence and 8.2 percent absolute precision. This result is similar to NTG ratio's achieved by other similar programs in other utility regions. Figure 3 shows Ameren Illinois results in comparison to other similar evaluations. Table 9 shows net savings for each program measure.

Figure 3. Comparison of Ameren Illinois NTG to other HVAC Programs

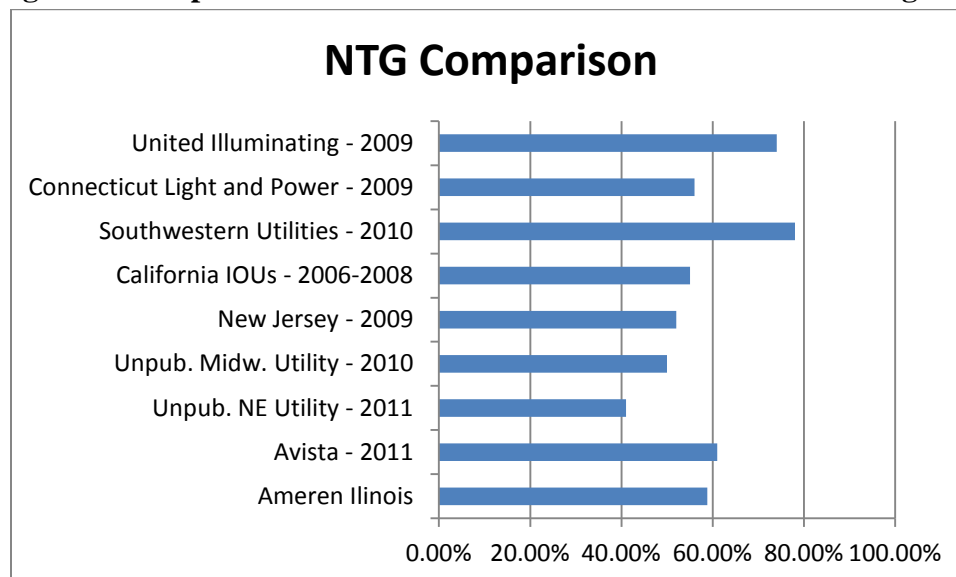


Table 9. PY3 Electric Energy and Demand Net Savings for Heating and Cooling Program

Measure	Annual Net Savings		
	NTG Ratio	Total Realized (MWh)	Total Realized (kW)
Early Replacement ASHP Cooling and CAC	0.59	6,989	5,125
Replacement at Burnout ASHP Cooling and CAC	0.59	374	274
Manual J Sizing	0.59	200	146
<i>Subtotal of ASHP Cooling and CAC</i>	0.59	7,563	5,547
GSHP Heating and Cooling	0.59	775	101

ASHP Heating	0.59	2,155	281
<i>Subtotal of ASHP Heating and GSHP Heating and Cooling</i>	0.59	2,930	382
Program Total	0.59	10,492	5,929

Over the two years since the program was launched, heating and cooling sales have increased considerably. Table 10 shows the program participation and gross savings for each year in the two-year period.

Table 10. Two-Year Program Results

Measure	Number of Incentives Provided		Realized Gross Savings (MWh)	
	PY2	PY3	PY2	PY3
Early Replacement ASHP Cooling and CAC	3,865	7,809	5,845	11,845
Replacement at Burnout ASHP Cooling and CAC	1,116	1,699	417	634
Manual J Sizing	1,972	3,237	194	339
GSHP Heating and Cooling	399	417	1,257	1,314
ASHP Heating *	-	-	2,777	3,652
Total	7,352	13,162	10,490	17,783

* Incentives numbers are included in the cooling numbers

Stakeholder Interview Findings

Cadmus interviewed the Ameren Illinois and CSG program implementer to understand the details of program delivery during PY3.

The interviewed stakeholders considered the program successful in terms of the number of installations performed. With the end of federal incentives, program managers were concerned that participation would decrease. Participation spiked at the end of December 2011 concurrent with the end of the federal incentives. This resulted in an abnormally busy January and February. Participation did briefly slow in early spring; however, it recovered during the normal peak replacement period. Increased marketing efforts contributed to higher participation in the program. Because Ameren Illinois program managers identify the program as a major source for future energy savings, they have also increased performance goals for PY4 and PY5.

To meet the challenges of increased program participation, CSG program administrators rolled out a web-based incentive application for selected program contractors to use. The application, which reduces the opportunity for the introduction of error, is streamlined for the contractors' use and incorporates recommendations provided in the PY2 evaluation. The goal is to include all program contractors in the online application process over the next two program years.

Program allies promote the Heating and Cooling Program throughout Ameren Illinois' service territory by using brochures and other marketing materials. During PY3, CSG reviewed contractor records to determine if any contractors were not active in the program. The review identified 165 contractors who had not installed incented measures but had used the Ameren logo in business materials and received program referrals. These contractors were removed from the list of Ameren-allied contractors.

Adjustment was necessary during PY3 when Ameren Illinois received evaluation results. The rebate for the installation of ground source heat pumps was limited to residences with electric heat going forward. Additionally, initial estimates for the NTG ratio for the Heating and Cooling program negatively impacted savings.

In PY4, program managers plan to increase the SEER rating of qualified early replacement and burnout central air conditioner and air source heat pump units, concurrent with the increase in federal standards. PY4 plans also include adding a diagnostic and tune-up program pilot intended to evaluate performance against equipment specifications.

Ameren Illinois and CSG program staff are in the initial stages of developing a comprehensive database. The intent of this database is to 1) integrate the Heating and Cooling program database with other incentive programs, 2) allow cross-referencing of customer participation in the various programs (both gas and electric), and 3) provide real-time data to Ameren Illinois program managers. This was a recommendation Cadmus made in the PY2 evaluation.

Contractor Survey Findings

Cadmus interviewed both participating and nonparticipating contractors to determine overall program satisfaction and to estimate the program net-to-gross (NTG) ratio. To simplify the process we randomly selected nonparticipating contractors from a list of inactive participants, contractors who initially signed up for the program but had not applied for any incentives in the previous 6 months.

We found that nonparticipants on average encouraged their customers to purchase high efficiency equipment 86.5 percent of the time. When we asked participants how often they encouraged their customers to purchase high efficiency equipment before participating in the program their average was 76 percent of the time, but after the program it increased to 97 percent.

Seventy percent of nonparticipants say they participated in the Act On Energy discount program, although program records indicate they had not applied for any incentives in the previous 6 months and were considered “inactive.” Of those stating they did not participate, 25 percent cited that they weren’t eligible for the program. Others had various reasons why they didn’t participate. One respondent said he was not happy with all the paperwork the dealers had to deal with.

Ninety-one percent of participating contractors promoted the federal tax incentive in addition to Ameren Illinois incentives. For those who did not, stated that it hardly was worth it and was too time consuming.

We surveyed both groups to find out their business firmographics with regard to size, certification, and years in business. Participant contractors were larger (17 employees per participant versus 11 per nonparticipant). Both participants and nonparticipants averaged only one BPI certified employee, although forty percent of nonparticipants and only 20 percent of participants didn’t know what BPI certified meant when we asked the question. On average the nonparticipants had been in business 36 years and those participating, 28 years.

When asked what percentage of their business is new construction vs. existing homes, nonparticipants said the average was 15 percent, while participants said an average of 20 percent. Table 11 shows the frequency of responses at different ranges along with the averages.

Table 11. Percentage of New Construction vs. Existing

Nonparticipants		Participants	
Range	Frequency	Range	Frequency
None	7	None	8
Less than 10%	5	Less than 10%	11
10% to less than 20%	3	10% to less than 20%	2
20% to less than 30%	1	20% to less than 30%	3
30% to less than 40%	0	30% to less than 40%	0
40% to less than 50%	2	40% to less than 50%	1
50% to less than 60%	1	50% to less than 60%	1
60% to less than 70%	0	60% to less than 70%	0
70% to less than 80%	0	70% to less than 80%	0
80% to less than 90%	1	80% to less than 90%	0
90% or more	0	90% or more	4
Average Percent	15%	Average Percent	20%

Participant Satisfaction

We asked participating contractors a series of questions around satisfaction of the program with regard to marketing, eligibility criteria, and difficulties encountered.

Only twenty-eight percent of participants do not actively market the program. Those that do, cite print ads, radio ads, flyers, promotion on their website and direct mail as the approach. One participant talked about a large marketing push where he promoted the program through print ads, web advertisements, newsletters, door hangers and offered it as part of the sales pitch. Participating contractors estimated that 35 percent of their customers are already aware of the program.

To qualify for Ameren Illinois Heating and Cooling Early Replacement incentives of \$600, the equipment being replaced must meet certain efficiency requirements. Fifty-five percent of participants stated that it was very easy to find equipment that meets the efficiency criteria, 15 percent said somewhat easy, 20 percent were neutral, and only 10 percent found it somewhat difficult. We also asked how easy it was to convince customers to upgrade to the required efficiency levels of the new equipment. Most participants (35%) were neutral on the topic, 19 percent found it somewhat difficult, 19 percent found it somewhat easy, and 27 percent found it very easy to convince customers to upgrade.

We asked participants if they would be interested in being a program ally for the planned on-bill financing program in the Act On Energy Program. A majority of them (75%) answered that they are interested (44% very interested and 31% somewhat interested). Most stated that the customers would be interested as well. When we asked them to estimate how much the loan program would increase their sales of energy efficient equipment, the average response was 25 percent. Table 12 shows the frequency of their responses.

Table 12. Estimated Impact of On-Bill Financing

Estimated Impact	Number of Responses
Nothing	3
Less than 10%	1
10% to less than 20%	7
20% to less than 30%	9
30% to less than 40%	3
40% to less than 50%	0
50% to less than 60%	3
60% to less than 70%	0
70% to less than 80%	1
80% to less than 90%	0
90% or more	0

Comments on Dissatisfaction

We asked all participants to describe any areas of program dissatisfaction. Forty-four percent of those surveyed made a comment regarding dissatisfaction. Communication issues were 40 percent of the reason for dissatisfaction. There was a strong call for better and more direct communications. Two of the contractors who commented felt that representatives were not good at returning calls. Other communication issues were that the contractors were not notified when the rebates changed.

Forty percent, of those who commented, cited that they didn't like the incentive changes. They felt it made it much more difficult to sell equipment. The remaining 20 percent cited that it is difficult dealing with all the paperwork—especially for commercial rebates⁶.

Suggestions for Improvement

Forty-four percent of participating contractors made a suggestion to improve the program. Forty percent of those suggested that there be better coordination with sizing and model requirements. One contractor said *“Model and serial numbers are very challenging to get especially for very old units. It is clear by looking at them that they are 30 years old, and the customers should be eligible for the replacement rebate, but there is no serial or model number so they cannot take advantage of the rebates.”*

⁶ While this program did not include commercial rebates some of the contractors also participate in a similar Ameren Illinois commercial program and were commenting on that program during the interviews.

Another forty percent suggested that the rebates go back to the previous higher levels (early replacement incentives dropped from \$600 to \$250 for central air conditioners and to \$400 for ASHP's starting in June 2011). The higher rebates were helpful in the past.

One respondent elaborated that they liked the idea of on-bill financing, if executed correctly. The respondent mentioned that customers say they would like the higher efficiency models, but need to put it on their credit card, and most contractors don't accept credit cards.

Participating Customer Survey Findings

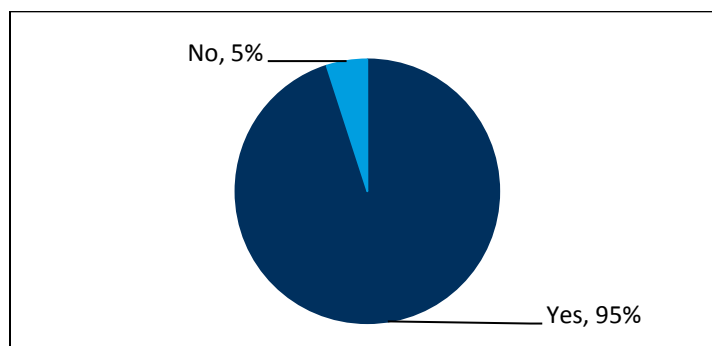
Below are the major topics of inquiry from the survey along with results and conclusions.

As shown in Table 13, participants became aware of the HVAC Program mainly through contact with dealers, installers, or contractors (60%), followed by a smaller share hearing about the program through word of mouth or seeing advertisements (13% and 7%).

Table 13. Program Awareness

Source of Awareness	Frequency	Percent
A home heating or cooling contractor who told you about it	94	60%
Someone else who told you about it	20	13%
Print advertisement from Ameren	11	7%
A mailed letter from a heating or cooling contractor in your area	9	6%
The Ameren Website or the Act on Energy Website	8	5%
Print advertisement from an HVAC contractor in your area	4	3%
Or some other way	5	3%
Saw/heard about it on television	5	3%
Another Website	1	1%

When survey respondents were asked whether or not their discounted amount on record was correct, 95 percent confirmed the amount on record (Figure 4). Among the six respondents who did not agree, three reported how much they received (\$300, \$700, and \$1,500). Figure 4. Is Our Record of Your Discount Amount Correct? (n=127)



As shown in Table 14, about 50 percent of survey respondents were motivated to participate in the HVAC Program because their existing HVAC system was nearing the end of its life.

Table 14. Reasons for Participating

Participation Reason	Frequency	Percent
Old one in disrepair	65	31%
Existing system likely to fail soon	42	20%
Wanted to save money	26	12%
Other	22	11%
Incentives made it cost effective	18	9%
Wanted to save energy	16	8%
Efficiency of new unit/inefficiency of old unit	12	6%
New construction	4	2%
Contractor recommended I replace my system now	3	1%
Reduce environmental impact	1	0%

When asked what the new HVAC unit replaced, a little less than half of the respondents reported some type of older HVAC unit that was still working. Many people explained that their unit was very old or close to end of its life. The next most common response was a non-working gas furnace (14%) followed by a non-working gas boiler (12%, Table 15).

Table 15. What the New Equipment Replaced

Replaced Equipment	Frequency	Percent
Some type of older working unit	68	45%
Non-working gas furnace	21	14%
Non-working gas boiler	18	12%
Non-working Central AC	11	7%
Working ASHP	7	5%
Non-working ASHP	8	5%
Working Central AC	7	5%
New construction	6	4%
Non-working heating unit	4	3%
Non-working GSHP	2	1%

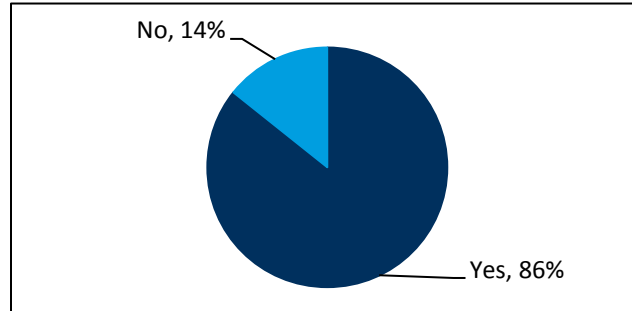
Respondents were asked how they found the contractor they used for buying the new HVAC system. The most common response was that the respondent had used the contractor before (43%).

Table 16. Means Through Which Contractor was Found

Source	Frequency	Percent
Used them before	71	43%
Recommended by friend or family member	34	20%
Other	27	16%
Yellow pages or internet search	16	10%
Shopping around	9	5%
Through Ameren Website or by calling Ameren	4	2%
Word of mouth	4	2%
Contractor contacted me first	2	1%

When asked if their contractor recommend that they purchase the energy-efficient measure, 86 percent said yes (Figure 5).

Figure 5. Did your Contractor Recommend you Purchase the Energy Efficiency Measure? (n=147)



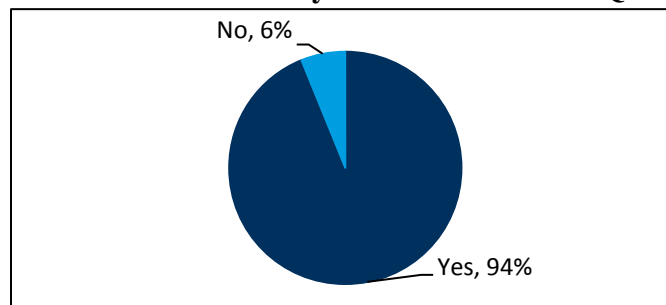
Among those who said that the contractor had recommended they purchase the energy-efficient unit, they were asked to rate the level of influence the contractor had on their decision on a scale of zero to 10. The majority of respondents rated their contractor as being very influential; 51 percent gave a rating of seven to nine and 24 percent gave a rating of ten. Only three percent said that their contractor had no influence at all (Table 17).

Table 17. Contractor’s Influence on Purchased Measure

Influence Level	Frequency	Percent
0	4	3%
1-3	4	3%
4-5	23	18%
7-9	64	51%
10	30	24%

The majority of respondents reported that the Ameren discount for energy-efficient home heating and cooling equipment was clearly listed on the price quote or invoice (94 percent, Figure 6).

Figure 6. Was the Ameren Discount Clearly Listed on the Price Quote or Invoice? (n=130)



The majority of respondents (76 percent) reported that they were aware that the federal tax credit was available when they purchased their HVAC unit (Figure 7). Among those who were aware of the tax credit, 96 percent said that they were planning to apply for the credit (Figure 8).

Figure 7. Aware that the Federal Tax Credit was Available at the Time of Purchase? (n=143)

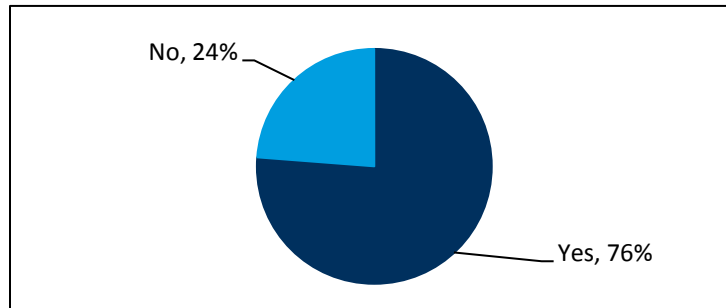
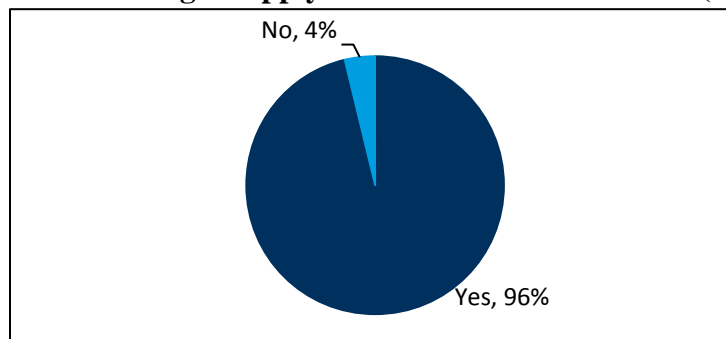


Figure 8. Planning to Apply for the Federal Tax Credit (n=106)



Nearly 70 percent said that it was likely to extremely likely that they would have purchased their new HVAC unit if only the Ameren discount had been available, excluding the Federal tax credit (67 percent, Table 18). Respondents were asked to explain what influence the Ameren Illinois discount had in their decision to purchase the new unit. The majority of respondents said that the discount did not make much of a difference because they would have to replace their unit at some point anyhow, but that the discount was an added bonus. Some people also said that the discount influenced them to not put off their purchase to a later date.

Table 18. Likelihood of Purchasing the Measure if only the Ameren Discount was Available

Likelihood	Frequency	Percent
Not at all likely	9	9%
Not very likely	21	20%
Neutral	4	4%
Likely	36	35%
Extremely likely	33	32%

5. Recommendations

The following recommendations are made for future program years.

- ***Ex ante Heating and Cooling Program unit savings should be revised.*** Use of *ex ante* per unit energy savings resulted in similar realization rates for the PY2 and PY3 evaluations. Gross per unit energy savings estimates should be revised to reflect realized gross per unit energy savings referenced in the two reports, to better track savings estimates over time.
- ***Collect more information on existing and new equipment.*** Additional data must still be collected to quantify all benefits resulting from the Heating and Cooling program. Existing heating capacity information for ASHP and GSHP installations should be collected to allow Ameren to quantify and claim all energy savings resulting from heating benefits. While we found make and model information in the database for existing units, it was unclear whether the data were input correctly as we found the new unit make and model data were sparsely populated. Finally, there should be a way to indicate (possibly through a check-off box) whether the heat pump will be used for heating, cooling or both and whether the existing heating system will also be used.
- ***Consider higher customer incentives for higher efficiency replacement products.*** The current incentive structure, which pays \$600 for the purchase of any high efficiency unit replacing a unit of SEER 10 or less, pays more than one-half of the incremental cost of a SEER 14 central air conditioner, but less than a third of a SEER 16 central air conditioner. In Cadmus' experience, measure proportion of freeridership is inversely proportional to the percentage of incremental cost paid. Paying higher incentives for the highest efficiency products should lower the overall rate of freeridership.
- ***Consider incorporating contractor incentives for meeting specific targets.*** An example might be to offer a bonus to contractors who achieve a certain level of energy efficiency sales. According to our contractor surveys, participating contractors sell high efficiency central air conditioner units 58 percent of the time and high efficiency ASHP's 66 percent of the time. Consider offering contractors bonuses if they achieve a higher percentage of energy efficiency sales (such as 80 percent).
- ***Consider eliminating or restructuring GSHP incentives.*** Since the incremental cost of GSHP units are greater than \$10,000, the \$600 incentive currently offered is not likely to be the motivating factor to convince customers to purchase a unit. When Cadmus analyzed freeridership in this evaluation using different approaches, GSHPs consistently had the highest freeridership levels. We recommend either eliminating this measure or designing the eligibility requirements and incentives to encourage the purchase of units that would not otherwise occur.

Appendix A. Participant Survey NTG Detail

Net-to-gross (NTG) estimates serve as a critical part of demand-side management (DSM) program impact evaluations as they allow utilities to determine the portion of gross energy savings influenced by and attributable to their DSM programs, free from the result of other influences. Freeridership and spillover comprise NTG's two components. Freeriders are customers who would have purchased the measure without any program influence. Spillover is the amount of additional savings obtained by customers investing in additional energy-efficient measures or activities due to their program participation. Various methods can be used to estimate program freeridership and spillover. Our baseline evaluation approach uses self-reports through participant surveys to estimate freeridership for the HVAC program, but not spillover.

Survey Design

Cadmus designed survey questions to determine why customers installed a given measure and the program's influence over those decisions. The survey goal was to establish what the decision maker might have done in the program's absence. Six core freeridership questions addressed that answer:

- Was the participant planning to purchase the measure before hearing about the program?
- Did the participant already have the measure installed before learning about the Ameren discount?
- Would the participant have purchased the exact same measure without the program?
- Would the participant have purchased a unit that was just as energy efficient without the Ameren discount?
- In the absence of the program, when would the respondent have installed the measures: at the same time, earlier, or later?
- How much later would the respondent have installed the system?

Freeridership Survey Questions

Six questions were included in the HVAC survey's freeridership portion, covering the six core freeridership questions listed above.

1. Were you planning to purchase a new [MEASURE] before you heard about the program?
2. At the time you first heard about the Ameren discount for an energy efficient [MEASURE], had you already installed your new equipment?
3. If the [INCENTIVE] had not been available, would you have purchased exactly the same [MEASURE]?
4. Help me understand, when you say you would have purchased the same [MEASURE], would you have purchased one that was just as energy efficient?
5. Would you have installed the system at the same time, earlier or later if the Ameren Illinois discount had not been available?
6. How much later would you have installed the system?

Cadmus developed a transparent, straightforward matrix approach to assign a score to participants, based on their objective responses to targeted survey questions. Question response patterns were assigned freeridership scores using a rules-based approach that decrements a respondent's freeridership score if a response to a question is not indicative of freeridership. This specific approach is cited in the NAPEE Handbook on DSM Evaluation, 2007 edition, page 5-1.

The response patterns and scoring weights remain explicit; they can be discussed, changed, and results shown in real time. Our approach provided other important features, including:

- Derivation of a partial freeridership score, based on the likelihood of a respondent taking similar actions in the incentive's absence.
- Use of a rules-based approach for consistency among multiple respondents.
- The ability to change weightings in a "what if" exercise, testing the response set's stability.

The NAPEE method offers a key advantage by introducing the concept of partial freeridership. Experience has taught us that program participants do not fall neatly into freerider and not-freerider categories. For example, partial freeridership scores were assigned to participants with plans to install the measure; though, the program exerted some influence over their decision, other market characteristics beyond the program also proved influential. In addition, with partial freeridership, we could utilize "Don't Know" and "Refused" responses by classifying them as partial credit, rather than removing the entire respondent from the analysis.

Freeridership was assessed at three levels. First, each participant survey response was converted into freeridership matrix terminology. Each participant's combination of responses was then assigned a score from the matrix. Finally, all participants were aggregated into an average freeridership score for the entire program category.

Convert Responses to Matrix Terminology

We independently evaluated each survey question's response to assess participants' freeridership level for each question. Each survey response option was converted into a value of "yes," "no," or "partial," which refers to whether the respondent's answer for the question was indicative of freeridership or not.

Table A-1 lists four survey questions, their corresponding response options, and the value which we converted them to (in parentheses). "Don't Know" and "Refused" responses were converted to "Partial" for all questions.

Table A-1. Assignments of HVAC Survey Response Options into Matrix Terminology

C1. Were you planning to purchase a new [MEASURE] before you heard about the program?	C2. At the time you first heard about the Ameren discount for an energy efficient [MEASURE], had you already installed your new equipment?	C3. If the [INCENTIVE] had not been available, would you have purchased exactly the same [MEASURE]?	C4 [ASK IF C3=1] Help me understand, when you say you would have purchased the same [MEASURE], would you have purchased one that was just as energy efficient?	C5. Would you have installed the system at the same time, earlier or later if the Ameren Illinois discount had not been available?	C6. [ASK IF C5=3] How much later would you have installed the system?
Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)	At the same time (Yes)	Later, but in the same year (Yes)
No (No)	No (No)	No (No)	No (No)	Earlier (Yes)	In 1 or 2 years (No)
Don't Know (Partial)	Don't Know (Partial)	Don't Know (Partial)	Don't Know (Partial)	Later (No)	In 3 to 5 years (No)
Refused (Partial)	Refused (Partial)	Refused (Partial)	Refused (Partial)	Don't Know (Partial)	After more than 5 years (No)
				Refused (Partial)	Don't Know (Partial)
					Refused (Partial)

Participant Freeridership Scoring

After converting survey responses into matrix terminology, we created a freeridership matrix, so the combination of each participant's responses to the four questions could be assigned a freeridership score. To create the matrix, we determined every combination of possible responses to the four survey questions, and then assigned a freeridership score of 0 to 100 percent to each combination. Using these matrices, every participant combination of responses was assigned a score of 0 to 100 percent.

Program Category Freeridership Scoring

After assigning a freeridership score to every survey respondent, Cadmus calculated an average freerider score for the program category. For the purposes of this analysis, a program savings weighted average was taken of the individual respondent level freeridership scores to arrive at the program freeridership estimate.

The Freeridership Scoring Model

Cadmus has developed an Excel-based model to apply the NAPEE approach and assist with freeridership calculation and improve consistency and quality of results. Our model translates raw survey responses into matrix terminology, and then assigns each participant's response pattern a score from the matrix. Program participants in the sample can be then aggregated by program category to calculate the average freerider score.

The model incorporates the follow inputs described in this methodology:

- Raw survey responses for each participant, along with the program category for their rebated measure, and energy savings from that measure, if applicable.
- Table E-2 below represent the converting of the raw survey responses into scoring matrix terminology (“Yes”, “No”, “Partial”) for each program category.

The model uses a simple interface, allowing users to quickly reproduce a scoring analysis for any program category. It displays each participant's combination of responses and corresponding freeridership score, and then produces a summary table, providing the average score.

Table A-2 below contains the full freeridership scoring matrix that was developed for the HVAC program.

Table A-2. Full HVAC Freeridership Scoring Matrix

C1. Now I have a few questions about the energy efficient equipment installed in your home. Were you planning to purchase a new [MEASURE] before you heard about the program?	C2. At the time you first heard about the Ameren discount for an energy efficient [MEASURE], had you already installed your new equipment?	C3. If the [INCENTIVE] had not been available, would you have purchased exactly the same [MEASURE]?	C4 [ASK IF C3=1] Help me understand, when you say you would have purchased the same [MEASURE], would you have purchased one that was just as energy efficient?	C5. Would you have installed the system at the same time, earlier or later if the Ameren Illinois discount had not been available?	C6. [ASK IF C5=3] How much later would you have installed the system?	String	Free-Ridership Score
Yes	Yes	x	x	x	x	YesYesxxxx	100%
Partial	Yes	x	x	x	x	PartialYesxxxx	100%
No	Yes	x	x	x	x	NoYesxxxx	100%
Yes	No	Yes	Yes	Yes	x	YesNoYesYesYesx	100%
Yes	No	Yes	Yes	Partial	x	YesNoYesYesPartialx	75%
Yes	No	Yes	Yes	No	Yes	YesNoYesYesNoYes	50%
Yes	No	Yes	Yes	No	Partial	YesNoYesYesNoPartial	25%
Yes	No	Yes	Yes	No	No	YesNoYesYesNoNo	0%
Yes	No	Yes	Partial	Yes	x	YesNoYesPartialYesx	75%
Yes	No	Yes	Partial	Partial	x	YesNoYesPartialPartialx	50%
Yes	No	Yes	Partial	No	Yes	YesNoYesPartialNoYes	25%
Yes	No	Yes	Partial	No	Partial	YesNoYesPartialNoPartial	12.5%
Yes	No	Yes	Partial	No	No	YesNoYesPartialNoNo	0%
Yes	No	Yes	No	x	x	YesNoYesNoxx	0%
Yes	No	Partial	x	Yes	x	YesNoPartialxYesx	75%
Yes	No	Partial	x	Partial	x	YesNoPartialxPartialx	50%
Yes	No	Partial	x	No	Yes	YesNoPartialxNoYes	25%

Yes	No	Partial	x	No	Partial	YesNoPartialxNoPartial	12.5%
Yes	No	Partial	x	No	No	YesNoPartialxNoNo	0%
Yes	No	No	x	Yes	x	YesNoNoxYesx	50%
Yes	No	No	x	Partial	x	YesNoNoxPartialx	25%
Yes	No	No	x	No	Yes	YesNoNoxNoYes	12.5%
Yes	No	No	x	No	Partial	YesNoNoxNoPartial	0%
Yes	No	No	x	No	No	YesNoNoxNoNo	0%
Partial	No	Yes	Yes	Yes	x	PartialNoYesYesYesx	75%
Partial	No	Yes	Yes	Partial	x	PartialNoYesYesPartialx	50%
Partial	No	Yes	Yes	No	Yes	PartialNoYesYesNoYes	25%
Partial	No	Yes	Yes	No	Partial	PartialNoYesYesNoPartial	12.5%
Partial	No	Yes	Yes	No	No	PartialNoYesYesNoNo	0%
Partial	No	Yes	Partial	Yes	x	PartialNoYesPartialYesx	50%
Partial	No	Yes	Partial	Partial	x	PartialNoYesPartialPartialx	25%
Partial	No	Yes	Partial	No	Yes	PartialNoYesPartialNoYes	12.5%
Partial	No	Yes	Partial	No	Partial	PartialNoYesPartialNoPartial	0%
Partial	No	Yes	Partial	No	No	PartialNoYesPartialNoNo	0%
Partial	No	Yes	No	x	x	PartialNoYesNoxx	0%
Partial	No	Partial	x	Yes	x	PartialNoPartialxYesx	50%
Partial	No	Partial	x	Partial	x	PartialNoPartialxPartialx	25%
Partial	No	Partial	x	No	Yes	PartialNoPartialxNoYes	12.5%
Partial	No	Partial	x	No	Partial	PartialNoPartialxNoPartial	0%
Partial	No	Partial	x	No	No	PartialNoPartialxNoNo	0%
Partial	No	No	x	Yes	x	PartialNoNoxYesx	25%
Partial	No	No	x	Partial	x	PartialNoNoxPartialx	12.5%
Partial	No	No	x	No	Yes	PartialNoNoxNoYes	0%
Partial	No	No	x	No	Partial	PartialNoNoxNoPartial	0%
Partial	No	No	x	No	No	PartialNoNoxNoNo	0%
No	No	Yes	Yes	Yes	x	NoNoYesYesYesx	50%
No	No	Yes	Yes	Partial	x	NoNoYesYesPartialx	25%

No	No	Yes	Yes	No	Yes	NoNoYesYesNoYes	12.5%
No	No	Yes	Yes	No	Partial	NoNoYesYesNoPartial	0%
No	No	Yes	Yes	No	No	NoNoYesYesNoNo	0%
No	No	Yes	Partial	Yes	x	NoNoYesPartialYesx	25%
No	No	Yes	Partial	Partial	x	NoNoYesPartialPartialx	12.5%
No	No	Yes	Partial	No	Yes	NoNoYesPartialNoYes	0%
No	No	Yes	Partial	No	Partial	NoNoYesPartialNoPartial	0%
No	No	Yes	Partial	No	No	NoNoYesPartialNoNo	0%
No	No	Yes	No	x	x	NoNoYesNoxx	0%
No	No	Partial	x	Yes	x	NoNoPartialxYesx	25%
No	No	Partial	x	Partial	x	NoNoPartialxPartialx	12.5%
No	No	Partial	x	No	Yes	NoNoPartialxNoYes	0%
No	No	Partial	x	No	Partial	NoNoPartialxNoPartial	0%
No	No	Partial	x	No	No	NoNoPartialxNoNo	0%
No	No	No	x	Yes	x	NoNoNoxYesx	12.5%
No	No	No	x	Partial	x	NoNoNoxPartialx	0%
No	No	No	x	No	Yes	NoNoNoxNoYes	0%
No	No	No	x	No	Partial	NoNoNoxNoPartial	0%
No	No	No	x	No	No	NoNoNoxNoNo	0%

Appendix B. Additional Freeridership Methodology and Results

This appendix presents the analysis and results of the remaining methods applied to estimate freeridership for the Heating and Cooling program.

Method 2 – Contractors Comparison Approach

Method 2 is based on a comparison of questions we ask in both participant and non-participant contractor surveys; specifically, what percentage of their sales of each measure type is energy efficient. We calculated freeridership by dividing the difference between the high efficiency units sold and those estimated to be sold if the program did not exist by the number of units receiving incentives, and then subtracting the ratio from 1.0.

According to the tracking database, participating contractors sold 2,225 high efficiency air conditioners during the period January through May. Through the survey, participating contractors reported that an average of 58 percent of all central air conditioners sold were high efficiency. Therefore total air conditioners sold through participating contractors is estimated to be 3,836. Our sample of nonparticipating contractors reported that 51.7 percent of their central air conditioner sales were SEER 14 or greater.

Freeridership then equals:

This method assumes that without the program, both participating and nonparticipating contractors would sell the same average percentage of energy-efficient units. However, contractors who already sell more high-efficiency units may be more likely to participate and therefore this method may underestimate freeridership. Alternatively, we used “in-active” participants as a proxy for nonparticipant contractors and these “inactive” contractors might also already sell higher percentages of high-efficiency units due to their earlier program involvement.

Table F-1 shows the relevant inputs for each measure type. Since nonparticipant energy-efficiency shares were the same or higher than participants, freeridership would be 100 percent under this approach. The small sample sizes (since all contractors didn't sell all measures) combined with likely recall error could be responsible for the counter-intuitive results.

Table B-1. Method 2 Freeridership Estimates

Measure	Participant Sales	Incentives Paid	Participant High Efficiency Share	Nonparticipant High Efficiency Share
Central A/C	3,836	2,225	58%	61%
ASHP	524	346	66%	70%
GSHP	185	185	0.04*	0.04*

* Since the program does not incent varying efficiencies for GSHP, we looked at the percentage of GSHP’s sold compared to the total cooling units sold (central air conditioners, ASHPs, and GSHPs). There was essentially no difference between the percentage of GSHPs sold between participants and nonparticipants suggesting zero program effect.

Method 3 – Contractors Self Report for All Efficiency Levels

This method relies on contractor responses to the question, *“Our records indicate that you sold X SEER 14 or greater central air conditioners during the first five months of 2011. Without the Ameren program incentives, how many do you think you would have sold during that period?”* Under this method, Cadmus calculated freeridership for each contractor interviewed using the formula:



We then weighted each response according to the percentage of sales within each stratum and the percentage of sales of each stratum within the total. Table F-2 shows the results of this method.

Table B-2. Freeridership for Method 3

Measure	Freeridership
Central A/C	70%
ASHP	80%
GSHP	74%

Weighting the results based on the number of each measure sold through PY3 yields freeridership of 75 percent.

This method assumes the respondent has no interest in the outcome of the evaluation. A savvy contractor may realize that their answers influence future program design and incentives, and could “game” their responses to make the program seem as though it had

more influence. It doesn't appear that Ameren Illinois contractors were gaming their responses since most indicated non or only modest increases in sales of high efficiency units. However, it does appear that contractors had difficulty separating out high efficiency sales from overall sales and separating program effects from external factors (such as economy or weather).

Method 4 – Contractors Self Report for Highest Efficiency Levels

This method relies on contractor responses to the same question as with method 3, *“Now we want to ask you about the highest efficiency levels. Our records indicate that you sold X of SEER 16 or greater central air conditioners during the first five months of 2011. Without the Ameren program incentives, how many do you think you would have sold during that period?”* However, with this method, we base the freeridership score only on the highest efficiency levels, assuming that customers who were already purchasing efficient units were driven to the highest efficiency levels by the program incentives. We then calculated freeridership for each contractor interviewed by the following formula:

$$\frac{\text{SEER 16 or greater units sold} \times \text{Freeridership score}}{\text{SEER 16 or greater units sold}}$$

We estimated freeridership for the program by calculating a weighted average of each freeridership value. Due to limited contractor responses for the highest efficiency levels, we could not estimate freeridership for this method.⁷

Method 5 - Price Elasticity

We also explored estimating NTG based on price elasticity for central air conditioners and air source heat pumps. In the participating contractor surveys, we asked about two different incentive level time periods. The first, January through May 2011, includes the incentive levels from PY3 (which we are currently evaluating), and the second, June 2011 through the present, includes time when the incentives were lowered for early replacement of central air conditioners (from \$600 to \$350 for SEER 16 or greater, and from \$600 to \$250 for SEER 14-SEER 15.9) and for replacement of air source heat pumps (from \$600 to \$400 for SEER 14-SEER 15.9). We asked participating contractors the following question for both periods: *“Approximately what percentage of your total residential customers who purchased [central air conditioners or air source heat pumps] received an Ameren Illinois incentive?”*

⁷ Of the 30 contractors interviewed, only 5 who sold SEER >14 efficiency level central air conditioners and only 3 who sold SEER >14 air source heat pumps also answered the question regarding how sales would have been different without the program. Further, each of them had only sold five or fewer of SEER >14 units.

Table F-3 below shows the efficient market shares as reported by participating customers during the two program periods along with the incentives offered for both central air conditioners and ASHPs. The difference in efficient market shares indicates a high degree of price elasticity. In fact applying a straight line to the trend would result in only slightly above zero efficient market for air conditioners and slightly below zero for ASHPs if incentives were zero. Figures F-1 and F-2 illustrate these trends. A shortcoming of the method is the assumption of a linear relationship between energy-efficiency sales and incentives. Another possible weakness of this approach is its assumption that price is the only reason for differences in sales. Seasonal differences may also be a factor as purchase decisions in summer may differ from purchase decisions in the winter and spring. Further concern is possible bias in the responses, contractors who want to continue with higher incentives may overstate the sales changes. Freeridership is estimated by projecting the energy efficiency market share when incentive levels are zero. For air conditioners this market share was about 10 percent and for ASHP's was zero (the result is a negative number, but freeridership cannot be less than zero).

Table B-3. Energy-Efficient Market Shares and Incentive Levels

Measure	January-May Incentive Levels	June-Present Incentive Levels	January-May Efficient Market Share	June-Present Efficient Market Share
Central Air Conditioners	600	250	0.58	0.33
ASHP	600	400	0.66	0.21

Figure F-1. Central AC Trend Analysis for Incentives and Energy-Efficient Market Shares

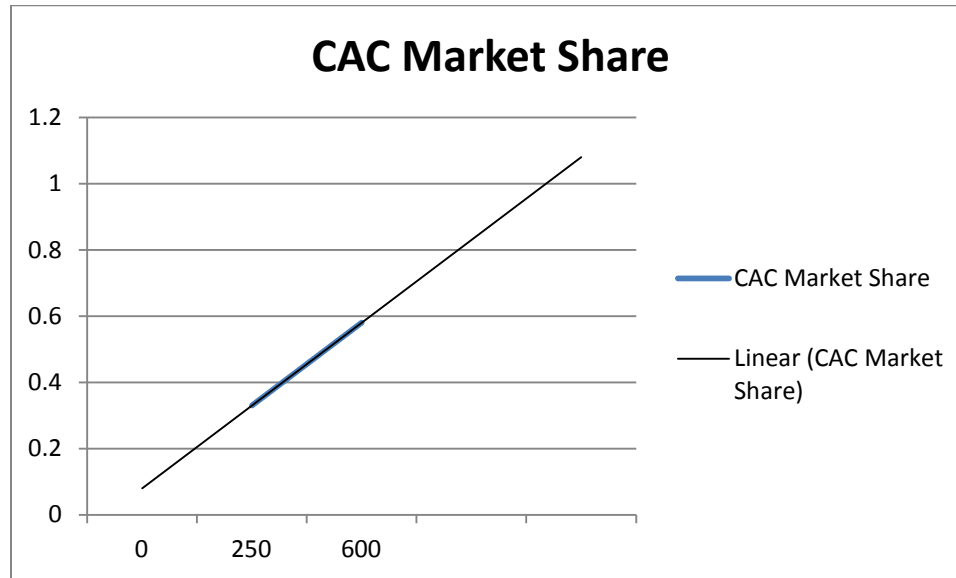
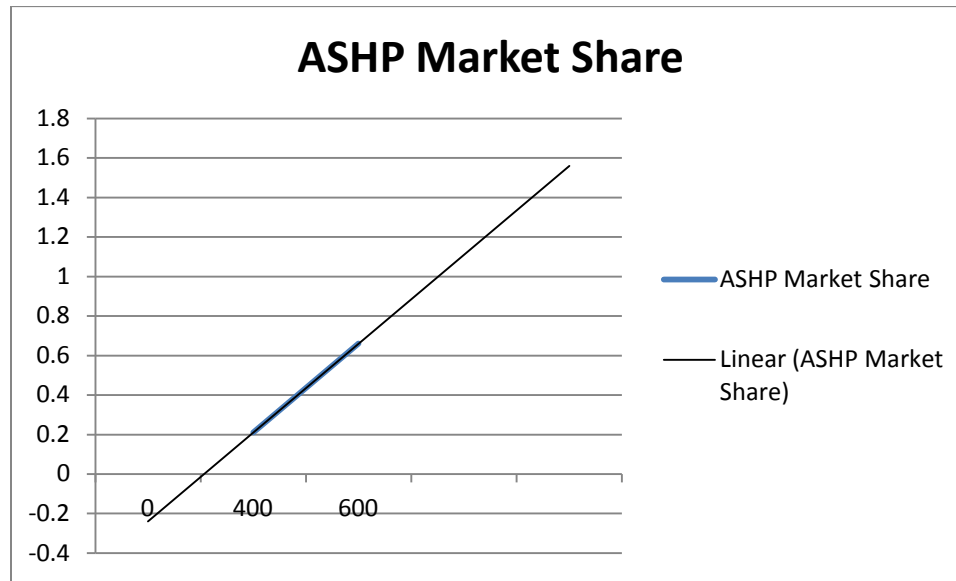


Figure B-2. ASHP Trend Analysis of Incentives and Efficient Market Share



While these analyses were fairly simple to perform once the contractor data was collected, it appears that the standard method using participant survey data resulted in the most reliable results. One issue with all the contractor survey-based methods was the relatively small sample size. Contractor survey samples in the future should be expanded to ensure adequate coverage of all measures sold.

Appendix C. Stakeholder Interview Guide

Hello, my name is _____ with The Cadmus Group. Thank you for taking the time to talk with me today about the **[Insert Program Name]** program for Ameren Illinois. The purpose of this interview is to update our understanding of the **[Insert Program Name]** program design for program year 3, including any changes you made since program year 2. I don't anticipate this taking more than 30 minutes, but I'd also like to hear if you have any specific suggestions for program improvements.

		DESIGN
WHO		
PM	About the interviewee	<ul style="list-style-type: none"> • What is your role in the program?
		<ul style="list-style-type: none"> • Are there any specific issues you'd like us to address in the evaluation? [If so, get their opinion on the issue and their suggestions]
SM	Program History and Design	<ul style="list-style-type: none"> • What changes were made to the program for program year 3 in comparison to program year 2?
PM		<ul style="list-style-type: none"> • What specific measures and their incentive amounts were available in program year 3?
		<ul style="list-style-type: none"> • What were the minimum requirements to obtain each incentive type?
		<ul style="list-style-type: none"> • [Add any other specific questions that came up during the analysis]
PM	Recommendations from PY2 Report (Review the recommendations prior to the call)	<ul style="list-style-type: none"> • Cadmus' PY2 evaluation identified the following recommendations for this program: • [For each one, ask if it were considered or addressed and how]
		WRAP UP
PM	Final Thoughts	<ul style="list-style-type: none"> • What were the biggest challenges you faced during PY3? • What is an area that went particularly well? • What changes are underway for PY4?

Appendix D. Participating Contractor Survey

Ameren Illinois Heating and Cooling Program

Participant Contractor Survey (n=30)

Name from list: _____

Respondent name (if different): _____

Respondent phone from list: _____

Interview date: _____ Interviewer initials: _____

Number of Year 3 incentives from Tracking Database (January 2011 through May 2011) **[Fill In number of incentives from Database. If Number =0, do not ask about that measure]:**

Number A.	A. Measures	Number B.	B. Highest Efficiency	C. Generic Measure
1. _____	Residential central air conditioners SEER 14 or greater.	_____	Residential central air conditioners SEER 16 or greater	Residential central air conditioners
2. _____	Air source heat pumps of SEER 14 or greater.	_____	Air source heat pumps SEER 16 or greater	Air source heat pumps
3. _____	Ground source heat pumps	_____	N/A	N/A
4. _____	New gas furnace of 92% AFUE or greater	_____	Gas Furnaces 95% AFUE or greater	Gas Furnaces
5. _____	New gas boiler of 90% AFUE or greater	_____	N/A	Gas Boilers

Introduction

Hello, my name is _____, and I'm calling from an independent research firm on behalf of Ameren Illinois. You may have received a call from an Ameren representative letting you know to expect our call. May I please speak with ___ **[FILL IN NAME FROM LIST]**? We are currently evaluating the Residential Heating and Cooling Incentive Program offered by Ameren

Illinois and you have been identified as a program ally who has applied for the Ameren Illinois Act On Energy HVAC program incentive. Ameren Illinois is required to survey program participants to determine program effectiveness and your participation will ensure that the program continues and is improved. We will be reporting in aggregate form therefore your company-specific information will remain confidential.

- A1. Would you have a few minutes to speak now?
1. Yes
 2. No **[Schedule a time]**
- A2. This interview will focus on your company's recommendation and installation of high efficiency equipment incentivized through the Ameren Illinois Residential Heating and Cooling program. May I confirm that your company is a participating contractor in this program?
- Yes, participant
 No, not a participant **[Terminate interview]**
 Don't know **[Ask for person knowledgeable about participation, else terminate interview]**
- A3. What is your title, and can you tell me what your job involves? **[Record Verbatim]**
- A4. Before you were in the program, about how often would you have encouraged customers to buy high efficiency equipment? **[FOR CLARIFICATION, THAT IS THE EQUIPMENT WITH EFFICIENCY LEVELS SIMILAR TO THOSE THAT PROVIDES AMEREN INCENTIVES?]**
- Never
 Less than 10% of the time
 10% to less than 20%
 20% to less than 30%
 30% to less than 40%
 40% to less than 50%
 50% to less than 60%
 60% to less than 70%
 70% to less than 80%
 80% to less than 90%
 90% or more
 Don't know **[PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]**
- A5. Now that you are in the program, how often do you encourage customers to purchase high efficiency equipment?
- Never
 Less than 10% of the time
 10% to less than 20%
 20% to less than 30%

- 30% to less than 40%
- 40% to less than 50%
- 50% to less than 60%
- 60% to less than 70%
- 70% to less than 80%
- 80% to less than 90%
- 90% or more

Don't know **[PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF THE CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]**

A6. In addition to the Ameren Illinois incentives, are you promoting the 2011 federal tax credits when you recommend equipment to your customers?

- Yes
- No

Free Ridership

I'm going to ask you a few questions about each of the equipment types eligible for incentives by Ameren Illinois. To answer these questions, please think of your equipment sales only in the areas served by Ameren Illinois. We will also ask you about two different time periods: 1) the current time or since June 2011, after Ameren Illinois reduced its incentives, and 2) the previous period from January 2011 through May of 2011, which was the time period after the federal tax incentives dropped and before Ameren Illinois' most recent changes in the incentive amounts.

[For the following free ridership questions, ask these questions for each measure in the table at the top of the survey in which the number of measures is greater than 0.]

ASK QUESTIONS B1, B2 for Air Conditioners, Air Source Heat Pumps, and Furnaces] [NOTE: IF THE RESPONSES ARE INCONSISTENT SUCH AS HIGH INFLUENCE BUT NO DIFFERENCE IN SALES, PROBE UNTIL YOU GET RESOLUTION]

B1. Thinking about the time period of January through May of 2011, approximately what percentage of your total residential customers who purchased **[Insert C from Table Above]** received an Ameren Illinois incentive? **[Do not read]**

- Never
- Less than 10% of the time
- 10% to less than 20%
- 20% to less than 30%
- 30% to less than 40%
- 40% to less than 50%
- 50% to less than 60%
- 60% to less than 70%
- 70% to less than 80%
- 80% to less than 90%

90% or more

Don't know **[PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF THE CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]**

- B2. **[Ask if C from table above = central air conditioner or Air Source Heat Pump]** Now shifting to the current period since Ameren Illinois reduced its incentives for early replacements of central air conditioners and air source heat pumps (starting June 2011 through the present). Approximately what percentage of your total residential customers who purchased **[Insert C from Table Above]** received an Ameren Illinois incentive? **[Do not read]**

Never

Less than 10% of the time

10% to less than 20%

20% to less than 30%

30% to less than 40%

40% to less than 50%

50% to less than 60%

60% to less than 70%

70% to less than 80%

80% to less than 90%

90% or more

Don't know **[PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF THE CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]**

[ASK QUESTIONS B3, B4 for Each "A" measure with Number A greater than zero.] [NOTE: IF THE RESPONSES ARE INCONSISTENT SUCH AS HIGH INFLUENCE BUT NO DIFFERENCE IN SALES, PROBE UNTIL YOU GET RESOLUTION]

- B3. Now I want go back to the previous period, January through May 2011. Our records indicate that you received **[Insert Number A]** of incentives for **[Insert A from Table Above]** during the period January through May 2011. On a scale from 1 to five, with 1 being "not important at all" and 5 being "very important", how important was the Ameren program and rebate in encouraging the sales of this equipment?" **[Record response verbatim: _____].**

- B4. OK, now let's try to get a little more specific. Without the Ameren program incentives, how many of **[Insert A]** do you think you would have sold during the first five months of 2011? **[Record response verbatim: _____].**

[ASK QUESTIONS B5, B6 for Each "B" measure with Number B greater than zero.] [NOTE: IF THE RESPONSES ARE INCONSISTENT SUCH AS HIGH INFLUENCE BUT NO DIFFERENCE IN SALES, PROBE UNTIL YOU GET RESOLUTION]

- B5. **[IF B6<NUMBER A FOR CAC, ASHP, or FURNACE]** Now I'd like to ask you specifically about the highest efficiency products in the program which would be SEER 16 and above for air conditioners and air source heat pumps or 95% efficiency levels for furnaces. Our records show that you received **[INSERT Number B]** incentives for **[Insert B]** through the program from January through May 2011. On a scale of 1 to five with 1 being "not important at all" and 5 being "very important", how important was the Ameren program and rebate in encouraging the sales of this equipment?" **[Record response verbatim: _____]**.
- B5b. OK, now let's try to get a little more specific. Without the Ameren program incentives, how many **[Insert B]** do you think you would have sold from January through May 2011? **[Record response verbatim: _____]**.

[ASK QUESTIONS B6-B9 FOR EACH "A" MEASURE WITH "NUMBER A" greater than ZERO.

- B6. _____ Since there are also federal tax credits of **[\$300 if asking about air conditioning or ASHP and \$150 if asking about gas furnaces and 30% for ground source heat pumps]** for some efficiency levels available in 2011, do you think your sales of **[INSERT A]** would have been higher, lower or the same as your sales in Ameren Illinois service territory during the period of January through May 2011 if both the Federal tax credit had not been available?

Higher
Lower
Same

- B7. **[Ask if B4 = higher or lower, else skip to B5]** Why do you think this is? **[Record response verbatim]**
- B8. **[Ask if B5 = higher or lower, else skip to C1]** By what percentage would they be higher/lower than current levels if neither the federal tax credits or Ameren Illinois incentives were available?
- No change
Less than 10%
10% to less than 20%
20% to less than 30%
30% to less than 40%
40% to less than 50%
50% to less than 60%
60% to less than 70%
70% to less than 80%
80% to less than 90%
90% or more
Don't know **[PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF THE CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]**
- B9. Just to confirm, you are saying that your sales of **[INSERT A]** would be **X% [higher, lower, or same]** during the first five months of 2011 without the both the Federal tax incentives and the

Ameren Illinois incentives.

Yes

No

[ASK B10 FOR EACH "A" MEASURE WITH NUMBER A GREATER THAN ZERO]

- B10. What do you estimate to be the average efficiency level of those **[INSERT MEASURE A]** **sold** that did **not** qualify for program incentives?

For Central Air Conditioner or Air Source Heat Pump: SEER Level _____

For Furnace or Boiler: AFUE Level _____

Program Marketing and Satisfaction

- C1. Did your company do any marketing to promote Ameren Illinois's Heating and Cooling incentive program in 2011? **[ENTER ALL THAT APPLY]**

Print ads

Radio ads

TV ads

Web ads

Offered as part of sales pitch by contractors

Other **[Specify: _____]**

Did not promote the Program

- C2. In your opinion, what percent of your customers were already aware of the incentive offered through the program before you provided them with that information? Was it:

None

Less than 10%

10% to less than 20%

20% to less than 30%

30% to less than 40%

40% to less than 50%

50% to less than 60%

60% to less than 70%

70% to less than 80%

80% to less than 90%

90% or more

- C3. To qualify for Ameren Illinois Heating and Cooling, \$600 early retirement incentives, the equipment being replaced must meet certain energy efficiency requirements. Would you say it is very easy, somewhat easy, somewhat difficult, or very difficult to find equipment that meets the efficiency criteria?

Very difficult

Somewhat difficult

Neutral **[do not read]**

Somewhat easy

Very easy

- C4. New equipment must meet certain levels of efficiency to receive incentives. Would you say it is very easy, somewhat easy, somewhat difficult, or very difficult to convince customers to upgrade to the required efficiency levels?
- Very difficult
 - Somewhat difficult
 - Neutral **[do not read]**
 - Somewhat easy
 - Very easy
- C5. Ameren Illinois is starting an on-bill financing program at 4.99% for the highest energy savings equipment in the Act On Energy Program. The on-bill financing allows participants to pay for the equipment over time on their utility bill. Would you say you are not at all interested, not very interested, somewhat interested or very interested in being a program ally who can offer this loan program?
- Not at all interested
 - Not very interested
 - Neutral **[do not read]**
 - Somewhat interested
 - Very interested
- C6. How much impact would you say this loan program would have in increasing sales of high efficiency equipment. Would you anticipate it could increase sales by:
- Nothing
 - Less than 10%
 - 10% to less than 20%
 - 20% to less than 30%
 - 30% to less than 40%
 - 40% to less than 50%
 - 50% to less than 60%
 - 60% to less than 70%
 - 70% to less than 80%
 - 80% to less than 90%
 - 90% or more
- C7. I am going to ask you to rate your overall satisfaction with Ameren Illinois' Heating and Cooling program. Please tell me if you were very dissatisfied, somewhat dissatisfied, somewhat satisfied or very satisfied with the program.
- Very dissatisfied
 - Somewhat dissatisfied
 - Neutral **[do not read]**
 - Somewhat satisfied
 - Very satisfied
- C8. **[Ask if C3<3, else skip to D1]** Will you describe any specific areas of dissatisfaction? **[Record response verbatim]**

Comments

- D1. Do you have any additional suggestions or comments regarding the Ameren Illinois Heating and Cooling Program? **[Record response verbatim]**

Demographics

Now I have a few questions about your store/company characteristics.

- E1. How many employees work in your company in the Ameren Illinois territory?
- E2. How many of them are BPI certified?
- E3. How many years has your business been selling Residential Heating and Cooling equipment in the Ameren Illinois territory?
- 1
 - 2
 - 3
 - 4
 - 5
 - More than five
- E4. What percentage of your Residential Heating and Cooling equipment sales in the Ameren Illinois territory are in new construction versus existing homes?
- None
 - Less than 10%
 - 10% to less than 20%
 - 20% to less than 30%
 - 30% to less than 40%
 - 40% to less than 50%
 - 50% to less than 60%
 - 60% to less than 70%
 - 70% to less than 80%
 - 80% to less than 90%
 - 90% or more

[THANK AND TERMINATE]

Appendix E. Nonparticipating Contractor Survey

Ameren Illinois Heating and Cooling Program
Non-Participant Contractor Survey (n=20)

Name from list: _____

Respondent name (if different): _____

Respondent phone from list: _____

Interview date: _____ Interviewer initials: _____

Introduction

Hello, my name is _____, and I'm calling from an independent research firm on behalf of Ameren Illinois. May I please speak with ____ **[FILL IN NAME FROM LIST]**? We are currently conducting important research about area sales of heating and cooling equipment. By participating in this very short survey of about a dozen questions, you will help Ameren Illinois understand HVAC activity in the market. Ameren is required to perform this research and have it performed by an independent company. We will be reporting in aggregate form therefore your company-specific information will remain confidential.

Would you have a few minutes to speak now?

Yes

No **[Schedule a time]**

A2. What is your title, and can you tell me what your job involves? **[Record Verbatim]**

A3. Currently, about what percentage of the time do you encourage customers to purchase high efficiency equipment? **[DO NOT READ]**

1. Never

2. Less than 10% of the time

3. 10% to less than 20%

4. 20% to less than 30%

5. 30% to less than 40%

6. 40% to less than 50%

7. 50% to less than 60%

8. 60% to less than 70%

9. 70% to less than 80%

10. 80% to less than 90%

11. 90% or more

DON'T KNOW [PROBE TO GET A RANGE THEY ARE COMFORTABLE WITH, IS IT LESS THAN 50% OR MORE?, IF LESS, THEN SAY LESS THAN 25% OR MORE, UNTIL YOU GET AS CLOSE A RANGE AS THEY ARE WILLING TO GO. IF RESPONSE IS NOT ONE OF THE CATEGORIES ABOVE, RECORD ACTUAL RESPONSE _____.]

Free Ridership

I'm going to ask you a few questions about different equipment types. To answer these questions, please think of your equipment sales only in the areas served by Ameren Illinois. We'd like to ask you specifically about sales of residential air conditioners, heat pumps, furnaces and boilers you made during the **first half of 2011**. If you need to check some records I can hold on for you.

[For the following free ridership questions, ask these questions for each applicable measure listed in the [] in the survey question.]

About how many **[central air conditioners/air source heat pumps]** did you sell during the first half of 2011? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

What percentage of your sales of **[Central Air Conditioners/Air Source Heat Pumps]** were higher efficiency levels, meaning SEER 14 or higher during this same period? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

What percentage of your sales of **[Central Air Conditioners/Air Source Heat Pumps]** were SEER 16 or higher during the period January through May 2011? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE] [CHECK: RESPONSE TO QUESTION B3 SHOULD BE A SUBSET OF B2]**

How many Ground Source Heat Pumps did you sell, if any, during the first half of 2011? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

How many gas furnaces did you sell during the first half of 2011? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

What percentage of the gas furnaces that you sold during the first half of 2011 were 92% AFUE or higher? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

What percentage were 95% AFUE or higher? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE] [CHECK: RESPONSE TO QUESTION B7 SHOULD BE A SUBSET OF B6]**

How many gas boilers did you sell during the first half of 2011? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

What percentage were 90% AFUE or higher? **[IF DON'T KNOW, PROBE BY ASKING WAS IT MORE OR LESS THAN 100, IF LESS THEN SAY, MORE OR LESS THAN 50, UNTIL YOU GET TO THE CLOSEST RANGE POSSIBLE]**

Reasons for not participating

Are you familiar with the Ameren Illinois Act On Energy incentive program where you can provide discounts to customer s for high efficiency equipment?

Did you participate in the discount program?

If not, why not? **[Record response verbatim]**

Spillover

Do you think Ameren's program influenced your sales of higher energy efficient equipment?

Yes [Ask] a. How did it influence? _____

b. You said you sold ___ [%] of high efficiency air conditioners. What percentage of your air conditioner sales do you think would be high efficiency without the Ameren Illinois program?

c. You said you sold [X%] of high efficiency ASHPs. What percentage of your ASHP's do you think would be high efficiency without the Ameren Illinois program?

d. You said you sold [X] GSHPs. How many GSHP's do you think you would have sold without the Ameren Illinois program?

e. You said you sold [B6%] of high efficiency furnaces. What percentage of your furnaces do you think would be high efficiency without the Ameren Illinois program?

f. You said you sold [X%] high efficiency boilers. What percentage of your boilers do you think would be high efficiency without the Ameren Illinois program?

No

Do you have any suggestions on how Ameren Illinois can improve the program? [\[Record response verbatim\]](#)

Demographics

Now I have a few questions about your store/company characteristics.

How many employees work in your company in the Ameren Illinois territory?

How many of them are BPI certified?

How many years has your business been selling Residential Heating and Cooling equipment in the Ameren Illinois territory?

1

2

3

4

5

More than five

What percentage of your Residential Heating and Cooling equipment sales in the Ameren Illinois territory are in new construction versus existing homes?

None

Less than 10%

10% to less than 20%

20% to less than 30%

30% to less than 40%

40% to less than 50%

50% to less than 60%

60% to less than 70%

70% to less than 80%

80% to less than 90%

90% or more

[THANK AND TERMINATE]

Appendix F. Participant Customer Survey and Demographic Results

INTRODUCTION

DIALSCR1 Hello, my name is _____ from Tetra Tech. I'm calling on behalf of Ameren Illinois about Act on Energy, the energy efficiency program offering discounts for heating and cooling equipment.

Can I please speak with [RESPONDENT NAME]?

- | | | |
|---|-----|------------------------|
| 1 | YES | [SKIP TO DIALSCR 2] |
| 2 | NO | [SKIP TO DISPO SCREEN] |

DIALSCR2 This is not a sales call. We have few questions about your experience with the program that will help you and other customers save energy and reduce utility bills. The interview should only take about 15 minutes and your responses will be kept entirely confidential. For quality and training purposes, this call will be recorded.

According to our records, your household participated in this program and received a discount on a new, energy efficient [MEASURE].

Are you the person in your home who knows the most about receiving a discount from Ameren Illinois' to purchase and install energy efficient heating or cooling equipment?

- | | | |
|----|-------------|------------------------|
| 1 | YES | [SKIP TO A1] |
| 2 | NO | [SKIP TO DISPO SCREEN] |
| 3 | NO, R FOUND | [SKIP TO DIALSCR3] |
| -8 | DON'T KNOW | [SKIP TO DISPO SCREEN] |
| -9 | REFUSED | [SKIP TO DISPO SCREEN] |

DIALSCR3 Hello, my name is _____ from Tetra Tech. I'm calling on behalf of Ameren Illinois about Act on Energy, the energy efficiency program offering discounts for heating and cooling equipment.

According to our records, your household participated in this program and received a discount on new, energy efficient

Are you the person in your home who knows the most about receiving a discount from Ameren Illinois' to purchase and install energy efficient heating or cooling equipment?

- | | | |
|----|------------|------------------------|
| 1 | YES | [SKIP TO DIALSCR 4] |
| 2 | NO | [SKIP TO DISPO SCREEN] |
| -8 | DON'T KNOW | [SKIP TO DISPO SCREEN] |
| -9 | REFUSED | [SKIP TO DISPO SCREEN] |

DIALSCR4 This is not a sales call. We have few questions about your experience with the program that will help you and other customers save energy and reduce utility bills. The interview should only take about 15 minutes and your responses will be kept entirely confidential. For quality and training purposes, this call will be recorded.

- | | | |
|---|----------|--------------|
| 1 | CONTINUE | [SKIP TO A1] |
|---|----------|--------------|

BACKGROUND INFORMATION

A1 First, I want to ask you some general questions about your experience with Ameren's program to offer discounts on energy efficient heating and cooling equipment and installation. How did you become aware of this program? Was it from:

- A1_1** A mailed letter from a heating or cooling contractor in your area
- A1_2** A home heating or cooling contractor who told you about it
- A1_3** The Ameren Website or the Act on Energy Website
- A1_4** Another Website [SPECIFY]
- A1_5** Someone else who told you about it [SPECIFY]
- A1_6** Print advertisement from an HVAC contractor in your area
- A1_7** Print advertisement from Ameren

A1_8 Or some other way [SPECIFY]

A1_9 Don't know

A1_10 Refused

A1_11 Saw/heard about it on television

For A1_1 through A1_11

0 Not mentioned

1 Mentioned

A1_OTH [IF A1_8=1] What other way did you become aware of the program?

[RECORD VERBATIM]

A2 Our records indicate that you installed a [MEASURE] that qualified for the Ameren Illinois discount. Is that correct?

1 Yes

2 No

-8 Don't Know

-9 Refused

A2_2OTH [IF A2=1] What did you install?

[RECORD VERBATIM]

A2_A Our records indicate that you received an Ameren Illinois discount of [INCENTIVE AMOUNT] when you installed the equipment. Is that correct?

- | | | |
|----|------------|-----------------|
| 1 | Yes | [SKIP TO A3] |
| 2 | No | [SKIP TO A2_B] |
| -8 | Don't Know | [SKIP TO A2_A1] |
| -9 | Refused | [SKIP TO A3] |

A2_A1 Is it the value of the discount that you are unsure of, or are you not aware that you received a discount in general?

- | | | |
|----|----------------------------------|--------------|
| 1 | Value of discount | [SKIP TO A3] |
| 2 | Unaware of program participation | [SKIP TO A3] |
| 3 | Other [SPECIFY] | [SKIP TO A3] |
| -8 | Don't Know | [SKIP TO A3] |
| -9 | Refused | [SKIP TO A3] |

A2_A1_3OTH [IF A2_A1=3] What else are you unsure of, besides the value of the discount or whether or not you participated?

[RECORD VERBATIM]

A2_B How much did you receive?

_____ [INCENTIVE AMOUNT]

- | | |
|----|------------|
| -8 | Don't know |
| -9 | Refused |

A3 Why did you decide to purchase and install the new heating or cooling equipment? [SELECT ALL THAT APPLY]

A3_1 Old one was in disrepair

A3_2 The incentives available made it cost effective to upgrade

- A3_3** My existing system was old and likely to fail soon
- A3_4** My contractor recommended I replace my system now
- A3_5** Wanted to save money
- A3_6** Wanted to save energy
- A3_7** Wanted to reduce environmental impact
- A3_8** Other [Specify Verbatim]
- A3_9** Don't know
- A3_10** Refused
- A3_11** Efficiency of the new unit/inefficiency of old unit
- A3_12** New construction

For A3_1 through A3_12

0 Not mentioned

1 Mentioned

A3_OTH [IF A3_8=1] How else did you become aware of the program?

[RECORD VERBATIM]

A4 What did the new equipment replace?

- 1 An old air source heat pump that didn't work [SKIP TO B1]
- 2 An old air source heat pump that did not work anymore [SKIP TO B1]
- 3 An old ground source (or geothermal) heat pump that still worked [SKIP TO B1]
- 4 An old ground source (or geothermal) heat pump that did not work [SKIP TO B1]
- 5 An old central AC that still worked [SKIP TO
A4_1]
- 6 Old central AC that did not work anymore [SKIP TO A4_1]

- | | |
|---|------------------|
| 7 Old gas furnace that did not work anymore | [SKIP TO A4_2] |
| 8 Old gas boiler that did not work anymore | [SKIP TO A4_2] |
| 9 Other [SPECIFY] | [SKIP TO A4_OTH] |
| 10 An old heating unit that did not work anymore. | [SKIP TO B1] |
| 11 It was new construction | [SKIP TO B1] |
| -8 Don't Know | [SKIP TO B1] |
| -9 Refused | [SKIP TO B1] |

A4_OTHR [READ IF A4=9] Specify 'Other' response from A4.

[RECORD VERBATIM] [SKIP TO A4_1]

A4_1OTH [READ IF A4=5, 6 OR 9] What type of equipment do you currently use to heat your home?

[RECORD VERBATIM]

A4_2OTH [READ IF A4=7, 8 OR 9] What type of equipment do you currently use to heat your home?

[RECORD VERBATIM]

PURCHASING PROCESS

B1 Now I have some questions regarding the process of purchasing your new heating or cooling equipment for your home. How did you find the contractor you used for buying the new equipment?

B1_1 Contractor contacted me first

- B1_2** Through Ameren Illinois website or by calling Ameren Illinois
- B1_3** Yellow pages or general internet search
- B1_4** Recommended by friend or family member
- B1_5** Used them before
- B1_6** Other [SPECIFY]
- B1_7** Don't Know
- B1_8** Refused
- B1_9** Shopping around
- B1_10** Word of Mouth

For B1_1 through B1_10

- 0 Not mentioned
- 1 Mentioned

B1_OTH [IF B1_6=1] How else did you find the contractor you used for buying the new equipment?

[RECORD VERBATIM]

B2 Did the contractor you purchased the [MEASURE] from recommend that you purchase the ENERGY EFFICIENT [MEASURE]?

- 1 Yes [SKIP TO B3]
- 2 No [SKIP TO B4]
- 8 Don't Know [SKIP TO B4]
- 9 Refused [SKIP TO B4]

B3 [READ IF B2=1] On a scale of 0 to 10 with zero being not at all influential and 10 being extremely influential, how influential would you say the contractor's recommendation was in your decision to purchase this exact [MEASURE]?

_____ [ENTER NUMBER]

-8 Don't know

-9 Refused

B4 Did the contractor explain the Ameren Illinois discounts that were available to help you purchase and install energy efficient heating and cooling equipment for your home?

1 Yes

2 No

-8 Don't Know

-9 Refused

B5 Did the contractor give you either a price quote or invoice for the cost of the new equipment?

1 Yes [SKIP TO B6]

2 No [SKIP TO C1]

-8 Don't Know [SKIP TO C1]

-9 Refused [SKIP TO C1]

B6 [READ IF B5=1] Was the Ameren discount for energy efficient home heating and cooling equipment clearly listed on the price quote or invoice?

1 Yes

2 No

-8 Don't Know

-9 Refused

MEASURE SPECIFIC QUESTIONS

[IF A2_A1=2, SKIP TO D1]

C1 **[READ IF A2_A1<>2]** Now I have a few questions about the energy efficient equipment installed in your home. Were you planning to purchase a new [MEASURE] before you heard about the program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

C2 **[READ IF A2_A1<>2]** At the time you first heard about the Ameren discount for an energy efficient [MEASURE], had you already installed your new equipment?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

C3 **[READ IF A2_A1<>2]** If the [INCENTIVE] had not been available, would you have purchased exactly the same [MEASURE]?

- 1 Yes [SKIP TO C4]
- 2 No [SKIP TO C5]
- 8 Don't Know [SKIP TO C5]
- 9 Refused [SKIP TO C5]

C4 **[READ IF A2_A1<>2 AND C3=1]** Help me understand, when you say you would have purchased the same [MEASURE], would you have purchased one that was just as energy efficient?

- 1 Yes
- 2 No [How would it have differed? SPECIFY]
- 8 Don't Know
- 9 Refused

C4_OTH [IF C4=2] What would have been different about your purchase if the Ameren Illinois discount had not been available?

[RECORD VERBATIM]

C5 [READ IF A2_A1<>2] Would you have installed the system at the same time, earlier or later if the Ameren Illinois discount had not been available?

- 1 At the same time [SKIP TO D1]
- 2 Earlier [SKIP TO D1]
- 3 Later [SKIP TO C6]
- 8 Don't Know [SKIP TO D1]
- 9 Refused [SKIP TO D1]

C6 [READ IF A2_A1<>2 AND C5=3] How much later would you have installed the system?

- 1 Later, but in the same year
- 2 In 1 or 2 years
- 3 In 3 to 5 years
- 4 After more than 5 years
- 8 Don't Know
- 9 Refused

FEDERAL TAX CREDIT BATTERY

D1 I have a few questions to ask you about the federal tax credits available for energy efficient heating and cooling systems. When you bought your [MEASURE], did you know that a federal tax credit was available?

- | | | |
|----|------------|--------------|
| 1 | Yes | [SKIP TO D2] |
| 2 | No | [SKIP TO E1] |
| -8 | Don't Know | [SKIP TO E1] |
| -9 | Refused | [SKIP TO E1] |

D2 [READ IF D1=1] Are you planning to apply for the federal tax credit?

- | | | |
|----|------------|--------------|
| 1 | Yes | [SKIP TO D3] |
| 2 | No | [SKIP TO D4] |
| -8 | Don't Know | [SKIP TO D3] |
| -9 | Refused | [SKIP TO D3] |

D3 [READ IF D1=1 AND D2<>2] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the EXACT same [MEASURE] if ONLY the Ameren discount were available and not the federal tax credit?

- | | |
|----|-------------------|
| 1 | Extremely likely |
| 2 | Likely |
| 3 | Neutral |
| 4 | Not very likely |
| 5 | Not likely at all |
| -8 | Don't Know |
| -9 | Refused |

D4_OTH [READ IF D1=1] Could you please tell me, in your own words, what influence the Ameren Illinois discount had in your decision to purchase this [MEASURE]?

[RECORD VERBATIM]

SPILLOVER

E1 Now I'd like to ask you about any energy saving actions you may have taken on your own since you completed the New Heating and Air Conditioning Equipment program. Since participating in the program, have you performed any activities or made any purchases to reduce energy consumption in your home?

- | | | |
|----|------------|-------------------------|
| 1 | Yes | [SKIP TO E2_1 TO E2_20] |
| 2 | No | [SKIP TO F1] |
| -8 | Don't Know | [SKIP TO F1] |
| -9 | Refused | [SKIP TO F1] |

E2 Please describe and additional energy efficient activities or purchases you made.

- E2_1** Performed a home audit
- E2_2** Recycled a refrigerator, freezer or air conditioner
- E2_3** Constructed an Energy Star New Home
- E2_4** Purchased CFLs? [ASK: How many?]
- E2_5** Purchased LED light bulbs? [ASK: How many?]
- E2_6** Purchased Light fixtures or ceiling fan [ASK: How many?]
- E2_7** Purchased efficient Refrigerator/freezer
- E2_8** Dishwasher
- E2_9** Clothes dryer
- E2_10** Room air conditioner [ASK: How many?]
- E2_11** Electronics (e.g. TV, DVD, computer)

E2_12	Dehumidifier
E2_13	Water Heater
E2_14	Low flow showerhead or faucet aerator [ASK: How many?]
E2_15	Programmable thermostat
E2_16	Insulation
E2_17	Solar panels
E2_18	Other [SPECIFY]
E2_19	Don't Know
E2_20	Refused

For E2_1 through E2_10

- 0 Not mentioned
- 1 Mentioned

E2_OTH [IF E2_18=1] What other activities/purchases have you made?

[RECORD VERBATIM]

E2_OTHR [IF E2_4=1 OR E2_5=1 OR E2_6=1 OR E2_10=1 OR E2_14=1] Describe the "other" activities with probes

[RECORD VERBATIM]

E3_1 [READ IF E2_1=1] Was the home audit conducted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know

-9 Refused

E3_2 [READ IF E2_2=1] Was the refrigerator, freezer or room air conditioner recycled as part of another Ameren Illinois program?

1 Yes

2 No

-8 Don't Know

-9 Refused

E3_2A [READ IF E2_2=1] Which of these did you recycle?

E3_2A1 Refrigerator

E3_2A2 Freezer

E3_2A3 Room Air Conditioner

E3_2A4 Don't know

E3_2A5 Refused

For E3_2A1 through E3_2A5

0 Not mentioned

1 Mentioned

E3_3 [READ IF E2_3=1] Was the newly constructed home discounted as part of another Ameren Illinois program?

1 Yes

2 No

-8 Don't Know

-9 Refused

E3_4 [READ IF E2_4=1] Were CFLs discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_5 [READ IF E2_6=1] Were the Light fixtures or the ceiling fan discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_6 [READ IF E2_12=1] Was the Dehumidifier discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_7 [READ IF E2_14=1] Was the Low flow showerhead or faucet aerator discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_8 [READ IF E2_15=1] Was the Programmable thermostat discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_9 [READ IF E2_16=1] Was the Insulation discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E3_10 [READ IF E2_18=1] Was the [RESPONSE FROM E2_OTH] discounted as part of another Ameren Illinois program?

- 1 Yes
- 2 No
- 8 Don't Know
- 9 Refused

E4OTH [READ IF E2_16=1] What level of R-level of insulation did you add, and in what location?

[RECORD VERBATIM]

E5 Which of the appliances that you installed, if any, were ENERGY STAR rated?

- E5_1** [READ IF E2_6=1] Light fixtures or ceiling fan
- E5_2** [READ IF E2_7=1] Efficient refrigerator or freezer
- E5_3** [READ IF E2_8=1] Dishwasher
- E5_4** [READ IF E2_9=1] Clothes dryer
- E5_5** [READ IF E2_10=1] Room Air conditioner
- E5_6** [READ IF E2_11=1] Electronics
- E2_7** [READ IF E2_12=1] Dehumidifier
- E2_8** [READ IF E2_13=1] Water Heater
- E2_9** None
- E2_10** Don't know
- E2_11** Refused

E6_1 [READ IF E2_1=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have performed a home audit if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_2 [READ IF E2_2=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have recycled the refrigerator, freezer or air conditioner if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely

- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_3 [READ IF E2_3=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have constructed an ENERGY STAR home if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_4 [READ IF E2_4=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the CFLs if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_5 [READ IF E2_5=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the LED light bulb(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_6 [READ IF E2_6=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the light fixture(s) or ceiling fan(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_7 [READ IF E2_7=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the energy efficient refrigerator(s) or freezer(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely

- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_8 [READ IF E2_8=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the dishwasher(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_9 [READ IF E2_9=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased a the clothes dryer(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_10 **[READ IF E2_10=1]** Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased room air conditioner(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_11 **[READ IF E2_11=1]** Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the electronics [REMINDE THEM OF THEIR SPECIFIC PURCHASE IF NECESSARY] if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_12 **[READ IF E2_12=1]** Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the dehumidifier(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral

- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_13 [READ IF E2_13=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the water heater(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_14 [READ IF E2_14=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the low flow showerhead(s) or faucet aerator(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_15 [READ IF E2_15=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the programmable thermostat(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_16 [READ IF E2_16=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the insulation if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know
- 9 Refused

E6_17 [READ IF E2_17=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the solar panel(s) if you had not participated in Ameren Illinois' Heating and Cooling program?

- 1 Extremely likely
- 2 Likely
- 3 Neutral
- 4 Not very likely
- 5 Not likely at all
- 8 Don't Know

-9 Refused

E6_18 [READ IF E2_18=1] Would you say it was extremely likely, likely, not very likely or not likely at all that you would have purchased the [MEASURE MENTIONED IN E2_OTH] if you had not participated in Ameren Illinois' Heating and Cooling program?

1 Extremely likely

2 Likely

3 Neutral

4 Not very likely

5 Not likely at all

-8 Don't Know

-9 Refused

E7 [READ IF E2_15=1] Did the programmable thermostat replace a manual thermostat?

1 Yes

2 No

-8 Don't Know

-9 Refused

DEMOGRAPHICS

F1 Finally, I have a few questions that will greatly help us analyse our survey information. As we mentioned earlier, your responses are kept confidential. Which one of the following best describes the type of home in which you live?

1 A single family detached

2 A single family attached

- 3 Multi-family home
- 4 A mobile home or trailer
- 5 Other [SPECIFY]
- 8 Don't Know
- 9 Refused

F2 What is the approximate age of your home?

_____ [NUMBER OF YEARS]

- 8 Don't know
- 9 Refused

F3 About how large is your home in square feet, excluding your garage and/or patio?

- 1 Under 1,000 square feet
- 2 1,000-1,500 square feet
- 3 1,501-2,000 square feet
- 4 2,001-2,500 square feet
- 5 2,501-3,000 square feet
- 6 More than 3,000 square feet [SPECIFY]
- 8 Don't Know
- 9 Refused

F3_OTH [IF F3=6] How large is your home in square feet?

[RECORD VERBATIM]

F4 Is your home [READ LIST]

- 1 All electric
- 2 Gas and Electric
- 3 Some other combination of energy sources [SPECIFY]
- 8 Don't Know
- 9 Refused

F4_OTH [IF F4=3] What combination of energy sources does your home use?

[RECORD VERBATIM]

F5 Do you own or rent your home?

- 1 Own
- 2 Rent
- 3 Other [SPECIFY]
- 8 Don't Know
- 9 Refused

F6 For 2010, which of the following categories best describes your total annual household income before taxes?

- 1. Less than \$15,000
- 2. \$15,000 to \$24,999
- 3. \$25,000 to \$34,999
- 4. \$35,000 to \$49,999
- 5. \$50,000 to \$74,999
- 6. \$75,000 to \$99,999
- 7. \$100,000 to \$149,999
- 8. \$150,000 or more

- 8 Don't know
- 9 Refused

F7 Which of the following best describes your age?

- 1. Less than 18 years old
- 2. 18-24 years old
- 3. 25-34 years old
- 4. 35-44 years old
- 5. 45-54 years old
- 6. 55-64 years old
- 7. 65 years or older
- 8 Don't know
- 9 Refused

F8 [GENDER OF RESPONDENT]

- 1 Male
- 2 Female
- 8 Don't Know

Demographics

Table F-1. Home Type

Home Type	Frequency	Percent
One family detached	150	96%
One family attached	6	4%

Table F-2. Age of Home

Age	Frequency	Percent
1-5 yrs	7	5%
6-10 yrs	5	3%

11-15 yrs	6	4%
16-20 yrs	17	11%
21-30 yrs	17	11%
31-40 yrs	30	19%
41-60 yrs	40	26%
61-100 yrs	24	15%

Table F-3. Size of Home

Square Feet	Frequency	Percent
<1000	2	1%
1,000-1,500	33	25%
1,501-2,000	34	25%
2,001-2,500	25	19%
2,501-3,000	12	9%
>3,000	28	21%

Table F-4. Fuel Type

Fuel Type	Frequency	Percent
All electric	32	21%
Gas and electric	113	72%
Combination of energy sources	11	7%

Table F-5. Owner/Rent Status

Home Type	Frequency	Percent
Own	155	99%
Rent	1	1%

Table F-6. Income Level

Income Level	Frequency	Percent
<15,000	8	6%
15,000-24,999	5	4%
25,000-34,999	5	4%
35,000-49,999	16	13%
50,000-74,999	26	21%
75,000-99,999	33	27%
100,000-149,000	24	19%
>150,000	7	6%

Table F-7. Age of Respondent

Age	Frequency	Percent
25-34	18	12%
34-44	14	9%
45-54	26	17%
55-64	45	29%
>65 yrs old	50	33%

Table F-8. Gender of Respondent

Home Type	Frequency	Percent
Male	103	66%
Female	53	34%