EVALUATION OF AMERENUE'S ONLINE ENERGY INFORMATION AND ANALYSIS PROGRAM

Prepared for

AMERENUE

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Executive Summary

The Online Energy Information and Analysis Program consists of an online energy audit where customers answer questions about their energy use and home characteristics on the AmerenUE website, and then are immediately provided with customized recommendations on ways to save energy. (A full description of this program is provided in Section II.)

Program accomplishments for the Online Energy Information and Analysis Program during the program period (2003-2006) include:

- Over 9,500 active Missouri users over the three year period
- Nearly 36,400 recommendations made
- Filling a unique informational niche for many, and
- Over 1,000 MWh of electricity savings and nearly 200,000 therms of natural gas savings to customers

Details on these program accomplishments are provided in Section III.

Customers use the online energy analysis primarily to save money on their electric bill or for related reasons such as learning how they can reduce their energy consumption and improve their home's energy efficiency (see Section VI Table D-3). Overall, most customers (89%) are satisfied with the program with 51% stating they are "very satisfied" and an additional 37% stating they are "somewhat satisfied". In addition, 46% of customers would strongly recommend this web-based analysis to others.

In addition to overall satisfaction among participants, the results of our impact analysis indicate that the program does lead to cost-effective energy savings. (See Section IV.) The savings from this program, however, are lower than for any other program in AmerenUE's portfolio, primarily because it is difficult to demonstrate savings since this is an information only program (i.e., no measures are provided through the program). However, our findings indicate that the program is cost effective, and that there is a need for this program: 43% of AmerenUE non-participants expressed an interest in the online energy analysis.

If AmerenUE and the Collaborative continue to fund this program, process recommendations for future programs include:

- Increase marketing efforts (such as email announcements and information on bills) since most AmerenUE customers are not aware of the offering
- Work to overcome barriers of multi-state marketing (since the AmerenUE merger, marketing has been limited)
- Make sure that the online tool is prominently placed on the website
- Consider additional ways of encouraging customers to log in such as drawing customers into the energy analysis by placing information about what the tool offers on earlier web pages

- Provide more customized recommendations to users, or to make users feel as though the current recommendations are customized
- Develop documentation for web extract data and reconcile the web statistics with the web extract data
- Improve usefulness of web extract data by collecting time and date stamp
- Require Nexus to provide algorithms for future impact analyses
- Confirm compatibility of software with Microsoft Vista

Details on each of these recommendations are provided in Section V.

I. Introduction and Methodology

The Online Energy Information and Analysis Program consists of an online energy audit where customers answer questions about their energy use and home characteristics on the AmerenUE website, and then are immediately provided with customized recommendations on ways to save energy. According to the program description, the Online Energy Information and Analysis Program "allows all residential customers with internet access to view their billing information and comparisons of their usage on a daily, weekly, monthly or annual basis. This tool analyzes what end uses make up what percent of their usage, and provides information on ways to save energy by end use through a searchable resource center. This tool also allows the user to analyze why their bill may have changed from one month to another. A home comparison also displays a comparison of the customer's home versus an average similar home via an Energy Guide label concept. AmerenUE is partnering with Nexus Energy Software to provide this functionality."

This report provides a process and impact evaluation of the Online Energy Information and Analysis Program, led by Opinion Dynamics Corp. in partnership with GDS Associates. This evaluation is based on (1) a review of program databases 2004-2006[1], (2) a review of program materials including monthly web statistics, traffic analysis, web extract data, and the program contract (3) an in-depth interview with the program implementer, i.e., Nexus, (4) telephone interviews with program participants, and (5) telephone interviews with non-participating customers.

ODC conducted telephone interviews in April 2007 with 70 AmerenUE customers who have used the Online Energy Analysis tool. All of the customers interviewed viewed recommendations on AmerenUE's website. We targeted customers who viewed recommendations between November 2005 and December 2006 so that they had enough time to react to recommendations—but not so long ago that they would not recall completing the analysis. Our survey asked respondents whether they took action as a result of up to 10 recommendations that were made to them. The survey then asked in detail about no more than five of the actions that they took at least in part due to the online energy analysis.

ODC also interviewed 100 AmerenUE customers who had not used the online energy analysis tool. AmerenUE provided ODC with a list of zip codes that fall within its service territory. Using this list, ODC obtained a random sample of phone numbers that corresponded with those zip codes. We compared this list to the list of program participants and removed the program participant phone numbers. We conducted these non-participant interviews in April 2007.

We do not provide all of the detailed tables in the body of the write-up for the purpose of keeping the write-up as succinct as possible. Key tables are provided in the body of the write-up, with additional detailed tables denoted by the letter "D" and provided in Section VI of this report.

[1] Provided by Nexus.

II. Program Description

In 2004, AmerenUE contracted with Nexus Energy Software to offer the Bill Analyzer and Home Energy Analysis to its residential customers. The budget for this program was $800,000 over the three year period, with a goal of reaching 9,000 customers per year. Spending to-date has totaled $786,333 since 2002, with upfront and implementation costs of $263,367 and annual expenses equal to $142,916 in 2003, $200,367 in 2005, and $124,683 in 2006.

The website can be accessed by clicking on "My Home" on AmerenUE's home page and then clicking on the "Energy Savings Toolkit". A user is then required to login by entering their username and password, and first time users must create a login by entering their name, email address, UserID, password and answer to a secret question. Until a user logs in they cannot see a description of what features are available within the application. The "Energy Savings Toolkit" includes the following five features:

- Home Energy Analysis is an energy audit where customers answer questions about their energy use and home characteristics and are provided personalized ways to save energy.
- Appliance Savings Calculators provide information about how much energy can be saved by replacing major appliances with more energy efficient models.
- Bill Analyzer compares a customers' current bill to their past bills and explains why they are different.
- Energy Smart Library gives low-cost tips that can help customers save money and energy.
- Energy Smart University offers facts about energy sources, safety, and the environmental impact of energy use.

As a customer completes more information the recommendations become more personalized to their home. There are three levels of questions that are used to generate a customer's Home Energy Analysis:

Level 1 – Basic Home Profile Questions: This section asks about property details (i.e., square footage, household type); property features (i.e., heating fuel, cooling type); utility details (i.e., ownership type, who pays the bills if rented); and equipment and amenities (i.e., do you have an oven and what is the fuel type).

When a customer answers the basic home profile questions they receive a list with the top ways that they can save energy with a range of estimated annual savings in dollars, a graph showing how their costs compare to similar homes, seasonal tips and tools, and a chart showing how their home uses energy broken into eight categories (heating, cooling, hot water, other, lighting, food storage, pool/spa, and other).

Level 2 – Appliance Inventory: For 24 appliance types, customers are asked whether the appliance is present in their home, how many and the fuel type (if applicable).

A customer who completes the appliance inventory section gets a picture of a house and when they click on an appliance a box pops up which tells them what the annual cost is to operate that

appliance as well as the energy usage. They also see a chart which shows them what appliances fall into that category and what the cost and energy usage is of each of the appliances in that category.

Level 3 – Detailed Questions on End-Use: Detailed questions about their home are broken into eight different end-use categories: weatherization, heating, cooling, hot water, kitchen, lighting, pool/spa, and other.

A customer who answers those detailed questions gets recommendations by those eight end-use categories broken into one of three categories: *no-cost/low-cost* ways to save that can be implemented immediately; ways to save which *need investment*, but will pay off; and ways to save, which are *not cost justified*.

There is also a detailed Home Energy Analysis Report that the customer can access after completing any of the three levels which is approximately 10 pages and includes a couple of graphs showing typical annual energy costs by end use for homes with similar appliances, an estimate of how much similar homes spend on energy on a monthly basis, and several detailed recommendations.

Customers are given a range of savings in dollars when they complete any of those three levels which are based on the rate the customer is on from AmerenUE billing data and the profile of the home based on their responses.

In aggregate, the program recommends 72 unique actions. The 72 recommendations fall into 13 different categories based on ODC's analysis (See Table 1 below). Many are associated with heating (13), water heating (11), and food storage (9).

Table 1: Recommendations by Category

Category	Number of Unique Recommendations
Heating	13
Water Heating	11
Food Storage	9
Cooling	7
Pool/Spa	7
Laundry	7
Lighting	4
Waterbed	4
Dishwasher	3
Windows and Doors	2
Insulation	2
Ducts	2
Home Electronics	1
TOTAL	72

AmerenUE handles most of the marketing efforts and promotions for the program. Until June 2005, the tool was promoted on the front page of Ameren's website. However, since AmerenUE's merger with an Illinois-based utility, the tool is no longer promoted on the first page because Illinois customers are not eligible to use the tool to its full extent. Use has declined since the merger and the weaker promotion of the tool, according to indepth interviews with program administrators (See also Figure 1). The last time the application was actively promoted was August 2005. Other marketing efforts by AmerenUE before the merger include:

- March 2004: Postcard mailing,
- June 2004: Email announcement – graduate hat,
- January 2005: Email announcement and billing insert,
- April – June 2005: Mentioned in the AmerenUE lines, and
- July - August 2005: Cash distribution contest run (contest offered money off the customer's bill for going to the application and filling out their profile on the home energy center).

Nexus provides the software and tracks customers' access to the website. Nexus sends web statistics to AmerenUE on the number of customers that accessed the Home Analyzer (including the Energy Analysis and Appliance Savings Calculators), Energy Saving Calculators, Energy Smart University and Energy Smart Library and what they looked at while logged in.

III. Program Accomplishments

Program accomplishments during the program period (2002-2006), described further below, include:

- Over 9,500 active Missouri users over the three year period
- Nearly 36,400 recommendations made
- Filling a unique informational niche for many, and
- Over 1,000 MWh of electricity savings and nearly 200,000 therms of natural gas savings to customers

Over 9,500 Active Missouri Users

Table 2 below shows several different estimates of users based on both the Web Statistics reported by Nexus and the web extract data files reported by Nexus on a monthly basis. The table shows that there were 13,420 hits on the "Energy Savings Toolkit" during the three year program period. (Note that hits do not equate to unique Missouri customers.)

Nearly 9,600 users were in the web extract tables, which include users who have entered some type of information. If a customer came to the site but did not provide any data, they would be included in the total number of hits but not in the web extract data (i.e., they are active users).

The table also shows that 8,033 users completed enough of their profile information that the system generated recommendations, however, only 2,011 of those users actually saw the top ways that they could save energy. According to Nexus, the user does not see all of the measures that the system generates (in "MeasurePlan" web extract tables). Only measures that provide the most savings (in "MeasuresResults" web extract tables) are displayed.

Based on the Web Statistics reported by Nexus, the total number of hits increased each year, however the number of customers who saw recommendations decreased slightly. If we look at the number of users who saw recommendations as a percentage of all "active users," 21% of users who start to fill in some information make it through the process and view the recommendations. (Notably, we do not look at it as a percentage of total hits since total hits does not include unique users, and captures people who get to the page by mistake, or have no interest at all.)

Table 2: Number of Users[a]

	2004	2005	2006	Total
Total Number of Hits[b]	3,805	4,672	4,943	13,420
Total Number of Active Users[c]	3,465	3,031	3,089	9,585
Total Number of Users who Completed Enough of the Profile that the System Generated Recommendations[d]	2,574	2,776	2,683	8,033
Users who Saw Recommendations[e]	756	637	618	2,011

a. Does not represent unique users across months and years.
b. Based on the "Home Analyzer: Total Number of Users: Detailed Analysis" row in the Web Statistics Reports compiled monthly by Nexus.
c. Based on the "UserMaster" tables which are a component of the web extract data. Based on conversations with Nexus, these tables include customers who have entered information.
d. Based on the "MeasurePlan" tables which are a component of the web extract data. According to Nexus, these tables show all the measures that were generated by the home profile.
e. Based on the "MeasuresResults" tables which are a component of the web extract data. According to Nexus, these tables show the results the user sees in the "Top Ways To Save" when they complete the home profile. The user does not see all the measures in the "MeasurePlan" table. Only measures that fall in the top category are displayed.

Nearly 36,400 Recommendations Made

In general, the number of recommendations that each participant receives varies widely, from one to 44 recommendations. Users receive an average of 18 recommendations for a total of 36,369 recommendations overall.

Table 3 shows the users who looked at recommendations that Nexus characterized as the "Top Ways to Save", the total number of recommendations made, the average number of recommendations made per user, as well as a minimum, maximum and standard deviation.

Table 3: Summary of Recommendations Made[a]

	2004	2005	2006	Total
Users who Saw Recommendations with the "Top Ways to Save"	756	637	618	2,011
Recommendations Made	14,557	10,752	11,060	36,369
Avg. # of Recommendations Made	19.3	16.9	17.9	18.1
Minimum Number of Recommendations	1	1	1	1
Maximum Number of Recommendations	42	44	41	44
Standard Deviation	11.6	11.6	11.5	(see by year)

a. Based on the "MeasuresResults" tables which are a component of the web extract data. According to Nexus, these tables show the results the user sees in the "Top Ways To Save" when they complete the home profile. The user does not see all the measures in the "MeasurePlan" table. Only measures that fall in the top category are displayed.

The recommendations most often made are associated with water heating (8,751), heating (5,878), and food storage (4,516). These are the same three categories for which there are the most unique recommendations.

Table 4: Recommendations by Category

Category	Number of Unique Recommendations	Number of Recommendations Made (2004, 2005 & 2006)
Water Heating	11	8,751
Heating	13	5,878
Food Storage	9	4,516
Laundry	7	3,897
Ducts	2	2,836
Insulation	2	2,351
Dishwasher	3	2,067
Lighting	4	1,888
Windows and Doors	2	1,776
Cooling	7	1,519
Home Electronics	1	435
Pool/Spa	7	241
Waterbed	4	214
TOTAL	72	36,369

The recommendations made are shown in Table 5 below. "Lower your thermostat setting" is the most frequently mentioned, recommended to approximately 74% of all customers who viewed recommendations.

Table 5: Most Frequently Made Recommendations (made to over 50% of participants, see also Section VI Table D-1 for top 30)

Category	Recommendation	Number of Times Recommendation Made (2004, 2005 & 2006)	Percentage of Customers who Received Recommendations[a]
Heating	Lower your thermostat setting	1,495	74%
Ducts	Seal leaks in your home's air ducts	1,474	73%
Windows and Doors	Install exterior solar screens on your windows	1,427	71%
Heating	Avoid heating unoccupied areas	1,381	69%
Ducts	Insulate your ducts	1,362	68%
Insulation	Control air leakage from windows and doors	1,343	67%
Water Heating	Install heat traps on your water heater	1,091	54%
Water Heating	Insulate your hot water pipes	1,091	54%
Water Heating	Maintain your water heater regularly	1,080	54%
Heating	Replace your heating system with a higher efficiency model	1,037	52%

Category	Recommendation	Number of Times Recommendation Made (2004, 2005 & 2006)	Percentage of Customers who Received Recommendations[a]
Laundry	Dry full loads of clothes when possible	1,021	51%
Insulation	Improve your home's insulation	1,008	50%
Food Storage	Maintain your refrigerator regularly	1,002	50%
Food Storage	Raise the temperature setting of your refrigerator	1,002	50%

a. Percentage is based on the 2,011 users who saw recommendations.

Filling a Unique Niche for Many

While 69% of participants stated that they had taken energy saving actions before using the online energy analysis, 64% of participants did not think they could easily find the information if the AmerenUE program did not exist. Actions taken before participating included installing efficient lighting, turning off unused lighting and adjusting heating and cooling temperatures.

Table 6: Could Find Info without Online Energy Analysis

Q11a: Do you think you could easily find this info if AmerenUE's Online Energy Analysis did not exist?	Participants (n=70)
No	64%
Yes	26%
Don't know	10%

Over One Thousand MWh of Electricity Savings to Customers and Nearly 200,000 Therms of Natural Gas Savings

Net realized savings were determined to be 407,554 kWh of electricity and 80,885 therms of natural gas in 2004, 297,099 kWh of electricity and 58,405 therms of gas in 2005; and 322,348 kWh of electricity and 60,037 therms of natural gas in 2006. The benefit cost ratio of the Online Energy Information and Analysis Program was determined to be 2.3, based on total program costs of $746,333. This program, therefore, is cost-effective. A full description of the impact and cost-effectiveness analysis is presented below.

IV. Impacts and Cost Effectiveness Analysis

The impact evaluation of AmerenUE's Online Energy Information and Analysis Program for years 2004 through 2006 was completed by reviewing for reasonableness the cost savings estimates for each of the recommendations that were made by Nexus through the website, estimating electric, peak demand, and natural gas savings per installation based on the cost savings, multiplying by the number of times the recommendation was made during a particular program year, and finally applying an installation factor based on the survey information collected from participants. The top fifteen recommendations in terms of savings were reviewed in detail, and by completing engineering calculations in order to determine if the savings estimated by the website algorithm were reasonable. (Notably, the top 15 in terms of savings is different than the top 15 recommendations made. The top 15 in terms of savings was determined using the unit savings multiplied by the number of times the recommendation was made.)

Review of Recommendations

First, we examined the mean savings in dollars for each recommendation (provided by Nexus in the database) for reasonableness based on the description of the recommendation since the algorithm used by Nexus was not available for review. In addition, we determined the top fifteen recommendations in terms of savings (that is, based on the number of times the recommendation was made and the mean savings per unit) and then reviewed the top 15 recommendations in terms of savings in detail.

The top fifteen recommendations accounted for over 81% of savings estimated by the Nexus software. As part of our detailed review, we completed engineering calculations in order to determine if the savings estimated by the website algorithm could be reverse engineered using reasonable assumptions of equipment sizes, efficiencies, run times, and home square footages. The results of the review of the top fifteen recommendations are shown in Table 7 below.

Table 7: Review of the Top 15 Recommendations

ID	Description	Website mean savings per installation	Total 2006 savings based on number of times recommended	Adjusted savings per installation	Est. KWh	Est. KW	Est. Therms
WE3	Control air leakage from windows and doors	$135.43	$50,776	$135.43	339	0.12	108
HT27	Install an add-on Heat Pump	$167.09	$28,958	$167.09	-2,628	-0.01	319.00
WE6	Seal leaks in your home's air ducts	$67.58	$27,164	$67.58	169	0.06	54
HT1	Lower your thermostat setting	$73.78	$17,652	$73.78	0	0.00	69
WE7	Install exterior solar screens on your windows	$44.46	$17,148	$44.46	741	0.26	0
HT2	Avoid heating unoccupied areas	$41.20	$15,477	$41.20	0	0	39

ID	Description	Website mean savings per installation	Total 2006 savings based on number of times recommended	Adjusted savings per installation	Est. KWh	Est. KW	Est. Therms
CL10	Replace your central air conditioner	$73.88	$14,121	$73.88	1,119	0.39	0
WE1	Replace your windows or install storm windows	$165.18	$13,451	$271.00	678	0.24	215
HT16	Replace your heating system with a higher efficiency model	$25.01	$12,240	$79.68	0	0	74
WE5	Improve your home's insulation	$105.88	$12,059	$105.88	265	0.09	84
OA10	Turn off your computer(s) overnight	$98.60	$9,723	$15.00	227	0.00	0
CL2	Raise your thermostat setting and consider using ceiling fans	$60.47	$9,393	$33.00	500	0.18	0
WH13	Install low-flow showerheads	$39.12	$7,775	$39.12	228	0.023	24
WE4	Insulate your ducts	$19.00	$6,743	$19.00	111	0.011	12
WH22	Replace your water heater	$56.28	$6,339	$56.28	328	0.033	34

As shown in the table above, savings for most of the top fifteen recommendations were not adjusted because engineering calculations resulted in savings estimates similar to those suggested by the website algorithm. Two recommendations had savings adjusted upward (WE1 and HT16) and two recommendations had savings adjusted downward (OA10 and CL2). We also adjusted two other measures outside of the top 15 based on our quick review of all of Nexus's savings estimates provided in the program database. Other measures that had savings adjusted are shown in Table 8.

Table 8: Other recommendations that had savings adjusted

ID	Description	Website mean savings per installation	Total 2006 savings based on number of times recommended	Adjusted savings per installation	Est. KWh	Est. KW	Est. Therms
CL8	Use your whole-house fan more	-$28.47	-$1,340	$23.00	348	0.12	0
WH14	Take shorter showers	-$27.90	-$4,943	$23.00	134	0.013	14

The recommendations shown in Table 8 were adjusted because it was not clear why the associated savings would be negative. All other recommendations from the website were left unchanged.

Determination of Gross Savings

Gross savings were determined by estimating electric, peak demand, and natural gas savings per installation based on the cost savings, multiplying by the number of times the recommendation was made during a particular program year, and finally applying an installation factor based on the survey information collected from participants. Surveyed participants were asked if they took action on the recommendation for each recommendation they received. The percentage of participants that took action was applied to the savings associated with each recommendation. In instances in which a recommendation was not received by any of the participants surveyed, the average installation percentage for the recommendation category was used.

By recommendation category, the percentage of participants surveyed that acted based on the recommendations made is shown in Table 9.

Table 9: Percentage of participants surveyed that acted based on the recommendations (average for each category)

ODC Category	N	ACTION TAKEN Did you take action after receiving the online energy analysis…			
		Yes	No BUT planning to in future	No and NOT planning to	No, already did it
Cooling	17	47%	18%	24%	12%
Heating	85	46%	13%	22%	19%
Food Storage	13	15%	46%	38%	0%
Lighting	20	70%	25%	5%	0%
Pool/Spa	7	43%	14%	43%	0%
Windows and Doors	30	10%	23%	60%	7%
Insulation	42	50%	19%	17%	14%
Ducts	47	32%	15%	38%	15%
Water Heating	57	28%	12%	49%	11%
Laundry	15	53%	13%	20%	13%
Dishwasher	6	50%	0%	33%	17%
Home Electronics	10	50%	20%	20%	10%
Waterbed	0	--	--	--	--

Based on the methodology described above, gross program savings for the Online Program are shown in Table 10 below.

Table 10: Online Program Gross Savings

	Gross Annual Electric Savings (KWh)	Coincident Peak Demand Reduction (KW)	Gross Annual Gas Savings (Therms)
2004	699,391	173	146,248
2005	520,492	130	109,242
2006	559,777	142	152,392
Total	1,779,660	445	407,882

Determination of Net Realized Savings

Part of the participant survey asked how likely it is that if the recommendation hadn't been made by the online program participants would still have take the action they took. Table 11 shows the results of this survey.

Table 11: Free Ridership Survey Responses

ODC Category	N	FREE RIDERSHIP If it had not been recommended in the online energy analysis how likely is it that you would have taken action…				
		Probably would have	Definitely would have	Might or might not	Probably would not	Definitely would not
Cooling	7	0%	43%	14%	29%	14%
Heating	36	39%	36%	14%	11%	0%
Food Storage	2	0%	0%	50%	50%	0%
Lighting	14	50%	36%	7%	7%	0%
Pool/Spa	3	67%	0%	0%	33%	0%
Windows and Doors	3	33%	0%	33%	0%	33%
Insulation	21	43%	33%	5%	14%	5%
Ducts	15	53%	20%	13%	7%	7%
Water Heating	14	43%	14%	14%	14%	14%
Laundry	7	43%	29%	0%	0%	29%
Dishwasher	2	0%	50%	0%	0%	50%
Home Electronics	5	0%	0%	40%	40%	20%
Waterbed	0	--	--	--	--	--

In developing a free rider percentage for each category, it was necessary to make a determination by response category of how likely the action would have been, and then adjust the percentage of respondents accordingly. It was assumed that 100% of those in the "Definitely Would Have" category, 70% of those in the "Probably Would Have" category, and 30% of those in the "Might or Might Not" category would have taken the action they did in the absence of the program. This total free-ridership percentage was then applied to the gross savings. Finally, participants were asked if they learned anything from the online energy analysis that caused them to take actions or purchase equipment that was even more efficient than what was recommended. 34% said that they did. It is not known how much more efficient the purchased materials were, but it was assumed that, on average, the purchased materials in these cases were 10% more efficient than was recommended. In order to represent this spillover effect, 34% of the savings (after factoring free-ridership) were increased by 10% and back to the unaffected portion of the savings.

Table 12: Online Program Net Realized Savings

	Gross Annual Electric Savings (KWh)	Coincident Peak Demand Reduction (KW)	Gross Annual Gas Savings (Therms)
2004	407,554	103	80,885
2005	297,099	77	58,405
2006	322,348	84	60,037
Total	1,027,001	264	199,327

Program Cost Effectiveness

Table 13 shows the cost effectiveness of the three-year operations of AmerenUE's Online Energy Information and Analysis Program. FEMP UPV Discount Factors for electricity and natural gas for Census Region 2 (Including Missouri) were used for the benefit/cost analysis. The Department of Energy currently uses a 3% discount rate in determining discount factors. The weighted average of the expected lives of Online Program recommendations was 7.2 years for electric recommendations and 7.8 for natural gas recommendations, so an effective life of 8.0 years was used in determining the appropriate residential discount factors.

Table 13: Online Program Cost Effectiveness

Program Cost	First Year Program Savings	Effective Life of Recommendations	Lifetime Savings	Lifetime Benefit/Cost Ratio
$786,333	$281,062	8.0	$1,770,836	2.3

Detailed spreadsheets on the savings and life cycle costs analyses were provided to AmerenUE along with this report.

V. Process Findings and Recommendations

Customers chose to use the online energy analysis primarily to save money on their electric bill or for related reasons such as learning how they can reduce their energy consumption and/or to improve their home's energy efficiency (see Section VI Table D-3). Overall, most customers (89%) are satisfied with the program with 51% stating they are very satisfied and an additional 37% stating they are somewhat satisfied. In addition, 46% of customers stated that they would strongly recommend this web-based analysis to others.

Table 14: Overall Satisfaction

Q4a: Overall, how satisfied were you with the Online Energy Analysis?	Participants (n=70)
Very satisfied	51%
Somewhat satisfied	37%
Neither satisfied nor dissatisfied	4%
Somewhat dissatisfied	6%
Very dissatisfied	1%

Almost all participants (81%) found the initial log in process to be very easy. In all, about 87% of participants read the recommendations. Sixty percent of participants said they thoroughly read the recommendations, and 27% read some portions of the recommendations. In addition, another 13% just glanced through them. Most customers found the reporting and recommendations easy to understand. However, customers are less confident about the relevance and accuracy of the recommendations and information (as described more below).

- **Continue to provide service to customers in need of information since 43% of AmerenUE customers expressed an interest in the online energy analysis**

  Sixty-three percent of AmerenUE's customers use a computer at work, home or school. Of those who have a computer, 69% (representing 43% of all non-participants) said that they are at least somewhat interested in the Home Energy Analysis application. Thus, the interest is there (and many customers are "online") but most residential customers are not currently using the AmerenUE website, so are not that likely to come across the online energy analysis.

  Among those who have used the online energy analysis, almost half of respondents were at least slightly more satisfied with AmerenUE because of the program (see table below), and as mentioned above, most of those who use it are satisfied. And as described above, for many, it fills a unique information niche, that is, they don't feel that they can find this information anywhere else. As such, the online energy analysis does appear to offer value to customers—however, customers are not aware of this offering (see below).

Table 15: Satisfaction with AmerenUE As A Result of Use Online Energy Analysis

Q03: How much has the online energy analysis and the energy saving information on the website changed your level of satisfaction with AmerenUE?	Participants (n=70)
Much more satisfied	17%
Slightly more satisfied	31%
No change in satisfaction	46%
Slightly less satisfied	1%
Much less satisfied	1%
Don't know	3%

- **Increase marketing efforts (such as email announcements and information on bills) since most customers are not aware of the offering, and work to overcome barriers of multi-state marketing**

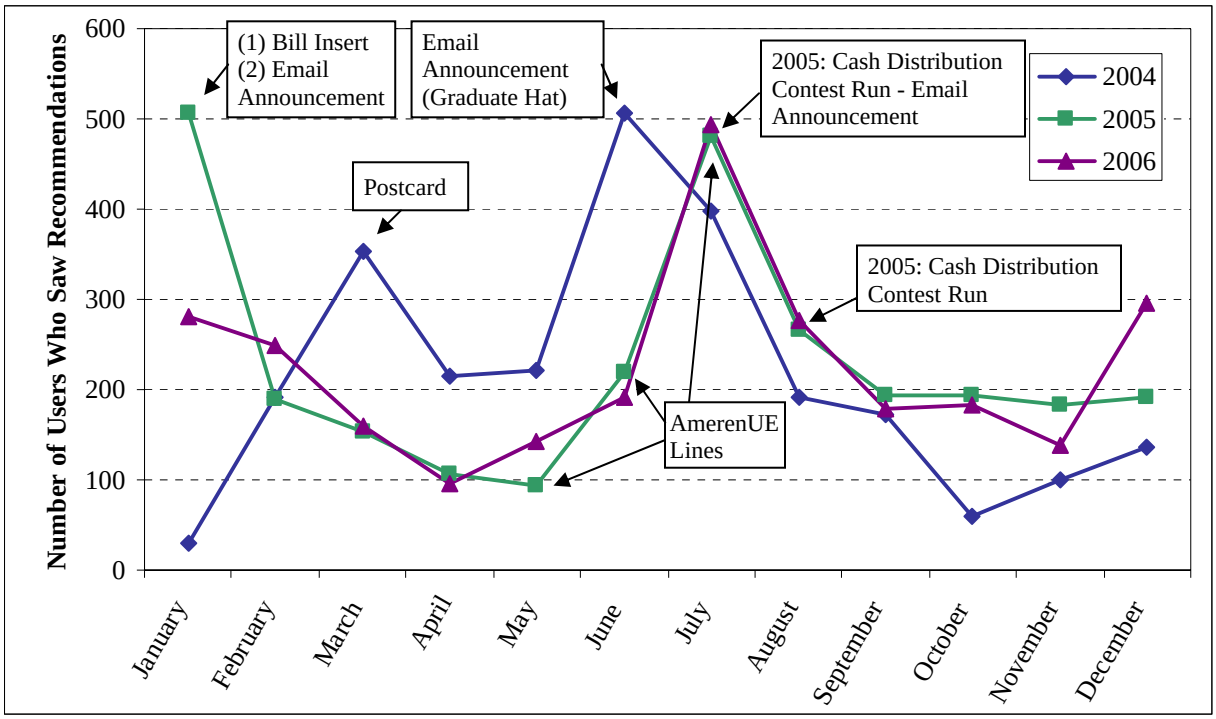
  While there appears to be interest, most AmerenUE customers are not aware that AmerenUE offers an online energy analysis. (Only 5% of non-participants that we spoke with were aware that AmerenUE's website includes an Energy Saving Toolkit.) As such, there is a need to increase awareness of this program through marketing efforts. Notably, however, the recent merger with Illinois has affected the overall marketing of this program.

Table 16: Awareness Among the General Population

QV1: AmerenUE's website includes an Energy Saving Toolkit or Energy Analysis for residential customers. Before this call, were you aware that AmerenUE offered this service?	Non-Participants (n=100)
No	95%
Yes	5%

Figure 1 below shows the number of users who received recommendations during the program period. Not surprisingly, the most active months correspond to when marketing events occurred. It seems that the most effective way to increase program activity would be to increase marketing efforts. AmerenUE should consider additional email announcements or information on customer bills to raise awareness of this program.

Figure 1: Program Activity by Month



Note: Ideally this graph would show the total number of hits from Table 2 but we did not receive customer-level data which could validate those numbers.

- **Make sure that the online tool is prominently placed on the website**

  The majority of customers who use the online energy analysis come across it while looking for other things on the AmerenUE website; about three-quarters (73%) of program participants with whom we spoke heard about the online energy audit program from the AmerenUE website.

Until June 2005, the tool was promoted on the front page of the website. However, since AmerenUE's merger with an Illinois-based utility, the tool is no longer promoted on the first page because Illinois customers are not eligible to use the tool to its full extent.

Without a "shout out" on the front page, the application is hard to get to on the website. The site can be accessed by clicking on "My Home" on the home page and then "Energy Savings Toolkit". A user is then required to login by entering their username and password or create a login by entering their name, email address, UserID, password and answer to a secret question.

AmerenUE should more actively promote and more prominently place the offering on AmerenUE's website (and consider offering the tool to its Illinois customers as well which would allow this to happen). Notably, however, only 8% of all non-participants have visited the AmerenUE website, so the "more prominent placement on the website" must be done in tandem with a general promotion of the offering (see above).

- **Draw customers into the energy analysis by placing information about what the tool offers on earlier web pages, and consider additional research to better understand the value of this offering**

The front page and the first few pages of questions do not appear to draw people further into the application as there were over 4,900 hits in 2006 but only 3,089 started to fill out any information (63%), and even fewer who got to the point of receiving recommendations. There is a significant difference between the total number of users who the system generated recommendations for (8,033) and the number of users who saw recommendations (2,011). In all, only 21% of those who started filling in some information saw recommendations AmerenUE may want to conduct interviews with participants who dropped out along the way to explore the reasons these people are not using the analysis to its full extent.

Until a user logs in they cannot see a description of what features are available within the application. AmerenUE should consider promoting aspects that customers like such as energy saving tips, information on the top ways to save, and information about my bill upfront (as customers are logging in). AmerenUE may also wish to conduct further research with customers to test different marketing strategies on the front page.

Table 17: Useful Information

Q5a: Was there any information provided by the Online Energy Analysis, in particular, that you liked or thought was useful?	Participants (n=70)
Energy saving tips	21%
Information on the top ways to save in my home	16%
Information about my bill	14%
Energy calculators	9%
Comparison of bills to other customers	6%
Pie chart of usage	3%
Graphs and charts	1%
Other	10%
No	21%
Don't recall/don't know	11%

- **Consider additional ways of encouraging customers to log in**

While participants generally felt that the process of signing in to the online energy analysis was easy and did not encounter any problems, non-participants who use computers were split on whether they would provide their name, email address, and account number on AmerenUE's website. (See table below.) As such, AmerenUE should also consider additional ways to encourage customers to log in. Drawing customers into the energy analysis by placing information about what the tool offers on earlier web pages may help to do this.

Table 18: Likely to Provide User Information

QW5: If you were visiting AmerenUE's website, how likely would you be to provide your name, email address and AmerenUE account number if you were prompted to log-in to the website?	Non-Participants (n=63)
Very likely	17%
Somewhat likely	21%
Neither likely nor unlikely	-
Somewhat unlikely	21%
Very unlikely	27%
Don't know	14%

- **Consider ways to provide more customized recommendations, or to make users feel as though the current recommendations are customized**

While most participants were satisfied to some extent, there is still room for increasing satisfaction with the tool. Most participants felt that it was easy to answer the questions that were asked at the beginning of the online analysis, and that the series of questions was of reasonable length. However, fewer customers felt that the survey asked the right questions to provide information customized for their home (see Section VI Table D-5).

Participants who were not fully satisfied stated that the recommendations were not specific enough, provided information that was not relevant to them, or provided information they already knew. Only 29% of participants stated that they strongly agreed that information provided to them was new, only 39% strongly believe the dollar savings that the energy report claimed customers would experience if they adopted the recommendations and only 41% strongly agreed that the recommendations were relevant to their homes. (See Section VI Table D-5.)

Only 37% of participants feel that the survey asks the right questions to result in customized information. Additional questions about what customers have already done, i.e., energy efficient actions taken, would provide better results for customers. Since almost everyone feels that the amount of time it took them to complete the survey was reasonable, it may be feasible to add questions to yield better recommendations.

AmerenUE should consider refining the questions so that they lead to even more customized recommendations. AmerenUE could find that customer confidence in the savings estimates will increase with more customized reports. Alternatively, there may be simple ways of

referring back to information the customer provided and/or to the customer billing data to make customers feel more like the information is specific to their home.

- **Develop documentation for web extract data and reconcile the web statistics with the web extract data**

Nexus was unable to provide the evaluation team us with a User Guide or any documentation to help the ODC Team understand the web extract data. While we were able to get some understanding of the data through telephone calls and emails it would be very helpful for those using the data to have some documentation that defines the variables and tables.

Specifically, it is not clear what users and recommendations are captured in the "MeasurePlan" table and "MeasuresResults" table. According to an email from Nexus:

"The "MeasurePlan" tables show all the measures that were generated by the home profile. The "MeasuresResults" tables show the results the user sees in the "Top Ways To Save" when they complete the home profile. The user does not see all the measures in the "MeasurePlan" table. Only measures that fall in the top category are displayed."

Questions that remained unanswered included:

- Why is the number of users in the "MeasureResults" table (618 in 2006) so much lower than the number of users in the "MeasurePlan" table (2,683 in 2006)?
- When we completed a home profile (see Appendix B), only four recommendations were generated in the "Top Ways To Save" section and 19 recommendations were shown in the "Home Energy Analysis Report". Based on the average number of recommendations per user of 18 using the "MeasureResults" data (see Table 3), it seems much more likely that the recommendations in the "MeasureResults" tables are actually those in the "Home Energy Analysis Report".

ODC was also not able to reconcile the web statistics compiled by Nexus with the web extract data. For example, the web extract data shows 618 users in 2006 in the "MeasuresResults" table which are the results the user sees in the "Top Ways To Save" when they complete the home profile, however, the Web Statistics show 828 users viewing at least one measure. We do not understand why the number of users viewing at least one measure would be higher than the number of users who see results in the "Top Ways To Save."

- **Improve usefulness of web extract data, collect time and date stamp**

When we completed a profile in the application we could see four recommendations in the "What are my top ways to save?" section of "My Home Energy Center": (1) insulate water heater tank, (2) use compact fluorescent bulbs in recessed fixtures, (3) use compact fluorescent bulbs in high-use lamps, and (4) lower the thermostat setting. We received 19 detailed recommendations (each a few paragraphs long) in the "Home Energy Analysis Report" (see *Online-Reports.pdf*). Ideally, we would like the web extract data to capture by user which recommendations the user saw in the "What are my top ways to save?" section, which of those recommendations were clicked on and viewed in detail, and which recommendations were viewed in the "Home Energy Analysis Report."

We would also like to be able to use the web extract data to determine the total number of user sessions and total number of recommendations made during a single user session. We do not know the total number of user sessions in a month because one user could have accessed the application multiple times in one month. Nexus also indicates that the recommendations shown for a single user in December may not actually reflect recommendations made during that month.

- **Require Nexus to provide algorithms for impact analysis**

  Nexus was unwilling to share the algorithm behind their savings estimates because it is proprietary information. While this is understandable, the existing algorithm could help to refine and/or confirm energy savings estimates.

- **Confirm compatibility of software with Microsoft Vista**

  Based on a very limited group, we found that it takes a long time to get into the "My Home" section of AmerenUE's website, the "Energy Savings Toolkit" and each link within the application when using a computer with the new Microsoft Vista operating system. AmerenUE may wish to have its IT staff look into this possible issue.

VI. Detailed Tables

Participant Tables

Section VI Table D-1: Most Frequently Viewed Recommendations (Top 30)

Category	Recommendation	Number of Times Recommendation Made (2004, 2005 & 2006)	Percentage of Customers who Received Recommendation
Heating	Lower your thermostat setting	1,495	74%
Ducts	Seal leaks in your home's air ducts	1,474	73%
Windows and Doors	Install exterior solar screens on your windows	1,427	71%
Heating	Avoid heating unoccupied areas	1,381	69%
Ducts	Insulate your ducts	1,362	68%
Insulation	Control air leakage from windows and doors	1,343	67%
Water Heating	Install heat traps on your water heater	1,091	54%
Water Heating	Insulate your hot water pipes	1,091	54%
Water Heating	Maintain your water heater regularly	1,080	54%
Heating	Replace your heating system with a higher efficiency model	1,037	52%
Laundry	Dry full loads of clothes when possible	1,021	51%
Insulation	Improve your home's insulation	1,008	50%
Food Storage	Maintain your refrigerator regularly	1,002	50%
Food Storage	Raise the temperature setting of your refrigerator	1,002	50%
Water Heating	Wrap your water heater with an insulating blanket	970	48%
Water Heating	Install efficient faucet aerators on your sinks	942	47%
Laundry	Match the clothes washer load setting to load size	920	46%
Dishwasher	Air dry your dishes	901	45%
Dishwasher	Wash full loads of dishes when possible	872	43%
Lighting	Use compact fluorescent bulbs in high-use lamps	814	40%
Water Heating	Install low-flow showerheads	785	39%
Water Heating	Lower the temperature of your water heater	713	35%
Heating	Install an add-on Heat Pump	665	33%
Water Heating	Take shorter showers	634	32%
Water Heating	Replace your water heater	629	31%
Cooling	Replace your central air conditioner	617	31%
Lighting	Turn off your lights when you're not using them	582	29%
Laundry	Replace your clothes washer with a higher efficiency model	577	29%
Laundry	Replace your dryer with a higher efficiency model	577	29%
Food Storage	Turn off your refrigerator's moisture control heater	564	28%

a. Percentage is based on the 2,011 users who saw recommendations.

Section VI Table D-2: First Heard About Program

Q1: How did you first hear about the Online Energy Audit?	Participants (n=70)
Ameren or utility website	73%
Utility bill insert	9%
Friend/relative	6%
Email sent to me	4%
Other	7%
Don't know	1%

Section VI Table D-3: Reasons for Using Online Energy Analysis (multiple responses)

Q2: What did you hope to accomplish by using the Online Energy Analysis?	Participants (n=70)
Save money on electric bill	56%
Reduce energy consumption	31%
Learn how you could improve your home's energy efficiency	16%
Make home more comfortable	11%
Improve the environment	6%
Increase value of home	1%
Other	9%
Don't know	4%

Section VI Table D-4: Difficulty of Sign In/Log On

Q5c: How difficult was the initial sign in or log on process?	Participants (n=70)
Very easy	81%
Somewhat easy	10%
Neutral	4%
Somewhat difficult	1%
Very difficult	-
Don't know	3%

Section VI Table D-5: Satisfaction with Process

Q6: I'm going to read you a series of statements about AmerenUE's online energy analysis. For each statement please tell me whether you …	Q6a: The questions about my home and appliances were easy to answer	Q6b: The amount of time it took to complete the online energy analysis was reasonable	Q6c: It asked the right questions to provide information customized for my home	Q6d: I would recommend the online energy analysis to others
Strongly disagree	-	-	4%	6%
Somewhat disagree	1%	6%	6%	1%
Neither disagree nor agree	1%	-	3%	1%
Somewhat agree	34%	33%	49%	43%
Strongly agree	59%	59%	37%	46%
Don't know	4%	3%	1%	3%

Section VI Table D-6: Reading the Recommendations

Q7a: Would you say that you…	Participants (n=70)
Read the recommendations thoroughly	60%
Read some portions of the recommendations	27%
Just glanced through them	13%
Did not read the recommendations at all	-

Section VI Table D-7: Satisfaction with Information Received

Q8: I'm going to read you a few more statements about the information that was provided by the online energy analysis. For each statement please tell me whether you …	Q8a: Was easy to understand	Q8b: Helped me better understand how I use energy in my home	Q8c: Provided information that I was not already aware of	Q8d: Helped me better understand the actions I could take to reduce my usage	Q8e: The recommend-dations were relevant to my house	Q8f: The amount of money it said I could save was believable
Strongly agree	63%	47%	29%	46%	41%	39%
Somewhat agree	36%	43%	39%	43%	43%	33%
Neither disagree nor agree	1%	4%	6%	1%	3%	7%
Somewhat disagree	-	4%	16%	1%	7%	11%
Strongly disagree	-	1%	10%	6%	4%	3%
Don't know	-	-	1%	3%	1%	7%

Section VI Table D-8: Actions Taken Before Participating (multiple responses)

Q12a,b: What actions had you taken before completing the energy analysis?	Participants (n=70)
Installed CFLs or efficient lighting	30%
Adjusted heating temperature	25%
Turned off lights	23%
Adjusted cooling temperature	21%
Purchased energy efficient appliances	16%
Other	20%
None	31%

Section VI Table D-9: More Efficient Actions

QPS1: Did you learn anything from the online energy analysis that caused you to take actions or purchase equipment that was even more efficient than what was recommended to you?	Participants (n=70)
No	60%
Yes	34%
Don't know	6%

Section VI Table D-10: Website Visits

Q04: How many times have you visited the AmerenUE.com website during the past 12 months?	Participants (n=70)
This was my first visit (once)	7%
2-5 times	46%
6 or more	43%
Don't know	4%

General Population (i.e., Non-Participant) Tables

Section VI Table D-11: Computer Use

QW0: Do you use a computer at home, work or school?	Non-Participants (n=100)
Yes	63%
No	37%

Section VI Table D-12: Visit Webpage

QW1: Have you ever visited AmerenUE's webpage?	Non-Participants (n=63)
No	87%
Yes	13%

Section VI Table D-13: Energy Analysis Use

QW2: Have you ever used the Energy Saving Toolkit or the Energy Analysis on the AmerenUE website?	Non-Participants (n=8)
No*	88%
Yes	12%

* The only reason given by a respondent for why they haven't used the toolkit even though they are aware of it is: *"I get so much off of the national news regarding energy that I didn't find it necessary."*

Section VI Table D-14: Usefulness of Information

QW2a: How useful did you find the information provided by the Energy Saving Toolkit on the AmerenUE website?	Non-Participants (n=1)
Very useful	100%
Somewhat useful	-
Neither useful nor useless	-
Somewhat useless	-
Very useless	-

Section VI Table D-15: Problems with Sign Up/Log In

QW3: Did you have any problems signing up for this service or logging into it?	Non-Participants (n=1)
No	100%
Yes	-

Section VI Table D-16: Interest in Online Energy Analysis

QW4: AmerenUE offers an online energy analysis on their website. How interested would you be in using the web-based energy analysis tool?	Non-Participants (n=61)
Very interested	21%
Somewhat interested	48%
Neither interested nor uninterested	3%
Somewhat uninterested*	5%
Very uninterested*	18%
Don't know	5%

* Reasons for not being interested include not having the time or the need and the information is generally too broad.

Section VI Table D-17: Online Energy Analysis Demographics

Demographics	Participants (n=70)	Non-Participants (n=100)
Household Type		
Single family	81%	83%
Duplex or 2 family	9%	4%
Apartment 2-4 units	1%	5%
Apartment >4 units	6%	5%
Mobile home	1%	1%
Other	1%	-
Number of People		
1	16%	27%*
2	36%	45%
3	16%	10%
4	20%	11%
5	10%	4%
6	3%	1%
7 or more	-	1%
Refused	-	1%
Low Income		
Non Low Income	80%	70%
Low Income	7%	16%
Don't know/refused	13%	14%

Demographics	Participants (n=70)	Non-Participants (n=100)
Year Built		
Built in 2006	-	-
2004-2005	7%	1%
2001-2003	10%	7%
1990-2000	17%	15%
1980-1989	13%	5%
1970-1979	17%	12%
1960-1969	7%	13%
1950-1959	6%	10%
1940-1949	-	5%
Prior to 1939	17%	12%
Don't know	6%	20%
Age		
22-35	36%	n/a
36-45	21%	n/a
46-55	20%	n/a
56 or older	17%	n/a
Don't know/refused	6%	n/a
Education		
Less than 9th grade	3%	2%
9th to 12th grade	-	4%
High school graduate	13%	33%
Some college, no degree	33%	21%
Bachelors degree	36%	18%
Graduate or professional degree	14%	10%
Don't know/refused	1%	4%
Ethnicity		
Caucasian	89%	88%
African American or black	6%	10%
Asian	1%	-
Other	1%	-
Don't know/refused	3%	2%