Natural Gas

Energy Efficiency Plan

Central Illinois Light Company d/b/a AmerenCILCO

Central Illinois Public Service Company d/b/a AmerenCIPS

Illinois Power Company d/b/a AmerenIP

(Ameren Illinois Utilities)

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Ameren Illinois Utilities

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1. Executive Summary

The Ameren Illinois Utilities ("AIU" or "Company") propose to implement a portfolio of natural gas energy efficiency programs to complement their proposed portfolio of electric energy efficiency programs. Such a complementary offering will enable the Company to address residential and small business[1] customer energy efficiency opportunities in a more comprehensive and customer-focused fashion. The gas energy efficiency programs proposed by the Company are designed to fit within the program structures developed for the Company's electric energy efficiency programs, such that program marketing and delivery efficiency can be maximized. The ability to offer both gas and electric efficiency options strengthens program messaging by eliminating the need for customers to segregate decision making between electricity options and natural gas opportunities.

The proposed funding levels with associated savings estimates are shown below.

Table 1. Gas Energy Efficiency Plan Proposed Funding and Savings Levels

	2009	2010	2011
Proposed Funding Level ($ millions)	$4.0	$5.0	$6.5
Proposed Gas Reduction Target (therms)	1,084,516	2,172,110	3,266,269
Proposed Gas Reduction Target (percent)	0.1%	0.2%	0.3%

The Company has worked to develop a portfolio of programs that uses best practice program design and delivery to reach specific customer groups with cost-effective energy efficiency options. The portfolio has been crafted to meet corporate objectives, and represents another step in an ongoing process to offer energy management services to our customers.

1.1. Summary of the Portfolio

The following table summarizes the portfolio the Company proposes. This is a portfolio that:

- Is cost-effective at the measure and program level (excluding the Residential Low Income program) and portfolio level. The overall portfolio benefit-cost ratio used the Total Resource Cost (TRC) test. The portfolio-wide TRC benefit-cost ratio is estimated to be 2.35.
- Is based on best practice. The program designs selected for this portfolio are based on a review of program experience across the country as reflected in several studies of best practice by the American Council for an Energy Efficient Economy.[2]

[1] Defined as customers taking service under the Rate GDS-2 tariff schedule.

[2] See for example, American Council for an Energy Efficient Economy **Examining the Potential for Energy Efficiency To Help Address the Natural Gas Crisis in the Midwest**, Martin Kushler, Ph.D., Dan York, Ph.D., and Patti Witte, M.A. January 2005, Report Number U051, and Responding to the Natural Gas Crisis: America's Best Natural

- Reinforces the Ameren Illinois Utilities' interest in market transformation. Our objective is to ensure consumers are able to use the information and tools provided over time through these programs to take control of their energy management decisions.
- Is flexible and manages risk. One key element of that risk management strategy is the flexibility to shift resources within the portfolio – to modify portfolio composition and risk as the market responds to our programs.
- Is scalable, to enable the Company to ramp programs up or down as needed. At this stage in the process, predicting precisely how each program will be met by the market is not possible. Therefore, having programs within the portfolio that can be quickly scaled up or down is essential to enable a rapid response to market changes. In particular, it is important that the portfolio include programs that can be efficiently scaled up as annual savings targets increase.

The following table summarizes portfolio energy savings costs and cost-effectiveness for the three year planning period.

Table 2: AIU Natural Gas Energy Efficiency Portfolio Summary

Market	Program Name	TRC Test Results	2009		2010		2011	
			Therm Savings	Cost ($M)	Therm Savings	Cost ($M)	Therm Savings	Cost ($M)
Residential	Home Energy Performance	2.85	587,829	$ 1.3	793,569	$ 1.7	881,744	$ 1.9
	ENERGY STAR New Homes	1.24	13,327	$ 0.1	15,530	$ 0.1	17,789	$ 0.1
	Residential Multifamily	1.21	47,586	$ 0.2	95,172	$ 0.5	142,758	$ 0.7
	Residential Low Income	0.94	19,232	$ 0.2	24,040	$ 0.3	31,253	$ 0.4
	Residential New HVAC	2.39	349,399	$ 0.5	698,798	$ 1.1	1,048,197	$ 1.6
Small Business	Small Business Tune-up	1.48	29,690	$ 0.1	59,379	$ 0.2	89,069	$ 0.2
	Small Business Food Service	6.89	359,210	$ 0.2	718,420	$ 0.4	1,167,433	$ 0.6
	Portfolio Level Costs			$ 0.6		$ 0.8		$ 0.9
	Projected Annual Totals	2.35	**1,406,273**	**$ 3.2**	**2,404,909**	**$ 4.9**	**3,378,241**	**$ 6.4**

Note: The estimated portfolio savings are based on building energy simulation of a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location.

1.2. The Planning Process

The Company's Plan reflects a detailed analysis process that included the economic screening of close to 50 natural gas energy efficiency measures, a review of utility program design best practices, the design of programs incorporating cost-effective measures, and program and portfolio cost-effectiveness analysis. Note that the number of measures screened for this plan is much lower than the number of measures considered in the electric plan. This is because within the residential and small commercial sectors, natural gas is used primarily for space and water heating. Therefore, the only measures of relevance are high efficiency space and water heating equipment, as well as measures that reduce space or water heating load, e.g., building shell improvements, infiltration reduction, heating system controls and hot water reduction measures.

Gas Energy Efficiency Programs, Martin Kushler, Ph.D., Dan York, Ph.D., and Patti Witte, M.A,, December 2003, Report Number U035

The analysis process is described in more detail in Section 4 and included the following steps:

- Assembly of a list of viable energy efficiency measures for the residential (Rate GDS-1-Residential Gas Delivery Service) and small business (Rate GDS-2 – Small General Gas Delivery Service) classes. The primary sources for the measure list were the Database for Energy Efficiency Resources (DEER) developed and maintained by the California Energy Commission, the program offerings referenced by the American Council for an Energy Efficient Economy (ACEEE) as exemplary, and ICF International's knowledge of natural gas efficiency measures in-place in other jurisdictions.
- Collection of energy savings and cost information from each measure. The primary source for non-weather-sensitive measure data was the DEER database. The energy savings associated with measures that are weather-sensitive were estimated by ICF International using the U.S. Department of Energy (DOE)-2 building energy simulation model.[3]
- Economic screening of the measures using the Company's avoided natural gas supply costs inclusive of an estimate of the cost of carbon dioxide (estimated at $15/ton). This screening process was based on the Total Resource Cost. The screening was conducted by ICF International using its energy efficiency program analysis model.
- Bundling measures that passed the screening process into logical program "elements", such as home performance or small business tune-up incentives.
- Expanding these basic program elements into program templates that describe program element structure, recruiting, implementation, incentive, administrative and evaluation strategies.
- Collection of program element data such as incentive levels, administrative, marketing and implementation costs and participation estimates.
- Screening the program elements for cost-effectiveness using the TRC test with the ICF portfolio analysis model.
- Adjusting individual program participation estimates to achieve portfolio balance.

1.3. The Challenge of Understanding and Managing Program and Portfolio Risk

Several types of risk must be accounted for in portfolio design and management:

- **Performance risk.** The risk that, due to design or implementation flaws, the program does not deliver expected energy savings. This risk is common to all program types.
- **Technology risk.** The risk that technologies targeted by a program fail to deliver the energy savings expected. This risk is concentrated in programs that target emerging technologies; systems that are aggregates of specific technologies, and/or systems in

[3] Non-weather-sensitive measures are those for which energy savings do not vary significantly as a function of local weather. These measures include food service equipment, some water heating measures, and a number of industrial process heating improvement measures.

which energy use is strongly influenced by external factors (e.g. customer behavior, economic conditions, etc).

- **Market risk.** The risk that, either because of a poor economic climate or the availability of better investments, customers choose not to participate in a program.
- **Evaluation risk.** The risk that independent Evaluation, Measurement and Verification (EM&V) will, based on different assumptions, conclude that energy savings fall short of what the implementers have estimated.

Typically, the first three types of risk are addressed through program design intended to minimize risk within a program and by ensuring the portfolio contains a mix of program types (different services, delivery mechanisms, providers, incentive types and levels, etc.) sufficient to avoid over-reliance on any one approach, technology or market.

Evaluation risk is addressed by commencing evaluation activities at the same time as programs are designed. Thus, evaluation protocols are understood by all parties at the outset, and the evaluation process is continuous as opposed to ex-post, allowing the Company and program implementers to adjust design and delivery to real-time information from the evaluators. This approach views evaluation not only as an independent verification of performance for regulatory purposes, but also as a vital input to a continuous process of program improvement.

Essential to the Company's risk management strategy is retaining sufficient flexibility to reallocate funds across program elements, including the ability to modify, add/or discontinue programs as dictated by additional market research and actual implementation experience. Specifically, we propose the following:

- The Company retains the authority to reallocate funds among program elements to ensure its ability to achieve its targets.
- The Company retains the authority to modify program designs.
- The Company retains the authority to significantly modify program elements.
- The Company retains the authority to dismiss implementation contractors under the terms of contracts signed with those implementers, and to add new contractors.

The proposed portfolio represents the initial effort to design a cost-effective mix of programs with a high probability of success. Following Commission acceptance of the Plan, we will proceed with final and detailed program designs and implementation plans. Continuing market research will also influence ongoing plan direction. Based on the information compiled through this process, these initial program designs most likely will be modified to strengthen the program offerings.

1.4. The Company's Proposed Programs

The Company has developed a portfolio of energy efficiency programs that will meet its objectives. The portfolio as a whole is cost-effective with a TRC test benefit-cost ratio of 2.35.

The AIU portfolio is built around two broad programs, each of which contains several program elements intended to provide a diverse range of energy efficiency options for residential and small business customers.

- Residential Energy Efficiency Solutions offer a range of options for residential customer energy management. The program is intended to offer customers multiple points of entry to the services offered by the Company, while at the same time promoting actions that can create the most value for customers. An important objective of this program is to use customer education, training, and technology to build a foundation for market transformation. Coupled with a consumer awareness and education effort, our objective is to focus services on comprehensive home performance upgrades, including heating systems replacements and thermal integrity improvements. The specific elements of the proposed Residential Energy Efficiency Solutions programs include:
    - New efficient furnace incentives. Incentives will be provided to either homeowners or HVAC dealers for the sale and proper installation of new gas central heating systems as replacements for existing systems.
    - Multi-family incentives. This program element will engage customers as well as recruit trade allies, i.e., private contractors, to promote the installation of low-cost/no-cost measures, insulation and water heating/space heating system replacement.
    - Single-family home performance. The single-family home performance program as part of the AIU electric filing allowed incentives for the all-electric homes. With the addition of the gas incentives in this plan, the single-family home performance program can now be expanded to include all homes.
    - Web-based residential energy audits. The Company intends to use this audit as one key portal to the broader portfolio of Residential Energy Efficiency Solutions. Consumers using the audit will be directed to specific incentive opportunities. Plans already are underway to install this element and costs will not be charged through the portfolio budget.
    - ENERGY STAR New Homes. Incentives will be provided to builders of ENERGY STAR-qualified new homes. The incentives will be set at a level to defray the cost of required energy ratings and additional marketing support will be provided.
    - Low income home energy efficiency. This program likely will include comprehensive building shell improvement, infiltration reduction and some heating system replacements targeted at gas heating customers matching the same income guidelines as those used to define this market for the Company's electric energy efficiency plan.
- Business Energy Efficiency Solutions offers a complementary set of energy management options to small business customers. Small business customers are defined as those meeting the tariff availability provisions of Rate GDS-2-Small General Gas Delivery Service. Incentives will be offered primarily for heating system replacements/operating improvements, efficient food service equipment and building shell improvements. Specific program elements will include:
    - Small business tune-up. A variety of HVAC tune-up and control measures are cost-effective based on gas savings alone. This program element would provide prescriptive and custom incentives for a range of HVAC equipment and controls installed in small business establishments. The program element will also include targeted outreach to Rate GDS-2 not-for-profit organizations and churches.

- Small business food service. This program element encourages food service businesses to replace a typical spray valve that flows up to three gallons of water per minute (gpm) with a low-flow unit can reduce hot water use by up to 250 gallons per day and cut gas use by up to 2 therms per day. Under this program element, the Company or its contractor would provide for direct installation of pre-rinse sprayers in food service establishments. In addition, the program element would provide incentives for efficient gas-fired cooking equipment.

1.5. Implementing the Plan

Achieving the Company's gas energy efficiency objectives requires effective and efficient portfolio and program management. However, the Company has not had substantial prior experience with design and implementation of natural gas energy efficiency programs. Therefore, this Plan represents a vision not only for an evolving portfolio of customer energy efficiency services, but for what will become part of a major new Company enterprise as well. We are committed to making this enterprise best-in-class based on the following basic principles:

- Attention to detail and performance is fundamental to the long-run success of our portfolio.
- Program designs and delivery approaches should be developed with the customer in mind and with a singular focus on maximizing the value our programs provided to our customers.
- Best-in-class performance requires ongoing evaluation and constant improvement in management and delivery based on evaluation results.

1.5.1. Overview of the Elements of Implementation

Successful implementation includes three key elements: (1) A sound implementation strategy; (2) An effective management strategy and (3) A plan for managing evaluation and quality assurance.

Implementation Strategy

Most programs will be implemented by third party contractors selected by the Company through competitive bid. The Company will explore the use of performance-based contracts that reward cost effective delivery of verified energy savings. The implementation contractors will be responsible for development of final detailed program designs and implementation plans, including all program participation and incentive forms and marketing collateral subject to approval by the Company. In most cases, the contractors will be responsible for customer recruitment, delivery of program services and incentive fulfillment.

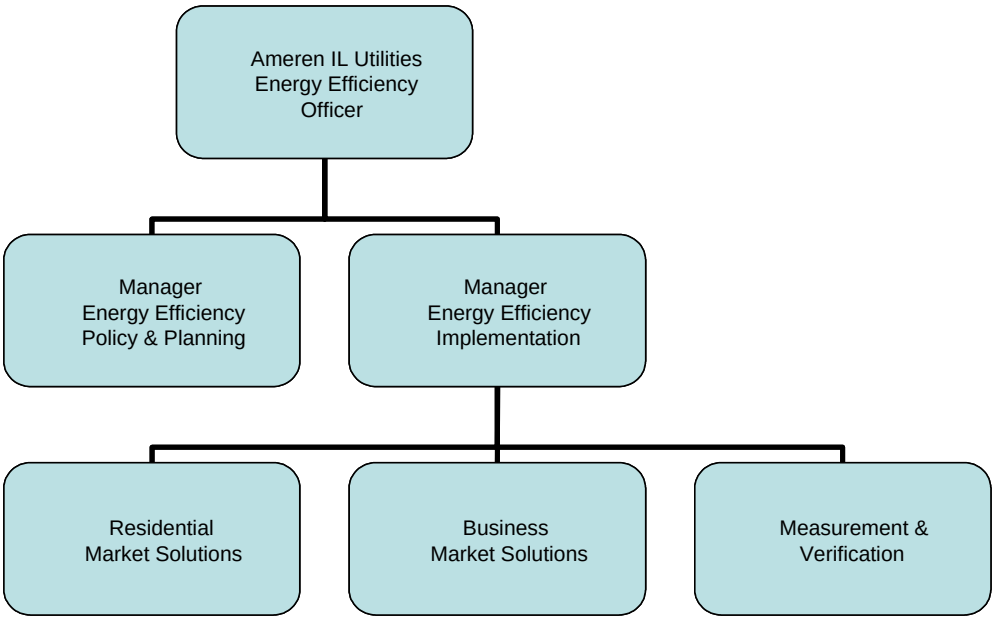
The Company is currently planning to launch the portfolio in the first quarter of 2009, and intends to issue requests for proposals (RFP) for program implementation services.

Management Strategy

The Company's program management strategy guides actual program implementation and encompasses a range of internal and external functions at both the portfolio and program level. The following figure illustrates the structure to be used by the Company for portfolio and program management. The Company intends to use the same organizational structure as

proposed for their electric energy efficiency programs, although resources allocated to the gas and electricity programs will be separately recorded and tracked.

Figure 1: AIU Natural Gas Energy Efficiency Organization Chart



Several processes are instrumental to our management strategy:

Planning, Market Research and Analysis: The planning process is continuous; as the implementation process yields impact and process information, program designs and implementation will be reviewed and, as necessary, adjusted. This first Plan was, by necessity, based on available data that did not include detailed information on our service territories' baseline characteristics. The Company intends to identify, plan and execute specific market assessment and market research projects over the next three years in an effort to improve its ability to design and target cost-effective energy efficiency programs. These projects could include:

- An appliance saturation study.
- Market characterization studies of key markets such as residential and small business HVAC, residential existing homes and new construction.
- Customer satisfaction surveys and focus groups designed to elicit customer feedback on program design and delivery.
- Program process evaluations to assess program design and implementation processes.

Portfolio Communications Plan: Each program element in the portfolio will have a specific marketing, communication and recruiting strategy. However, at the portfolio level, a broad communications strategy will be developed that addresses program branding, program collateral standards, customer service standards for implementation contractors, use of

Company's trademark by implementation contractors, call center and customer account representative training, web standards and integration with the Company's broader communications strategy. The gas energy efficiency communications plan will address opportunities to improve messaging and increase impact through joint communications with the electric energy efficiency plan.

Back Office Systems Development: Back-office systems for tracking, reporting and incentive fulfillment are a critical operational component of the energy efficiency portfolio. Accurate acquisition, storage and reporting of data are essential for portfolio management and goal achievement. The Company will develop a program and portfolio tracking system capable of providing timely information to evaluate portfolio and program performance and support adjustments in program efforts and focus. The system used for the gas programs will be integrated with that developed for the electric energy efficiency plan to ensure that consistent data are tracked, individual customers participating in both programs can be linked within the system and cost data associated with the gas and electric programs can be segregated where both sources of funds might be applied to a single project.

Quality Assurance Strategy

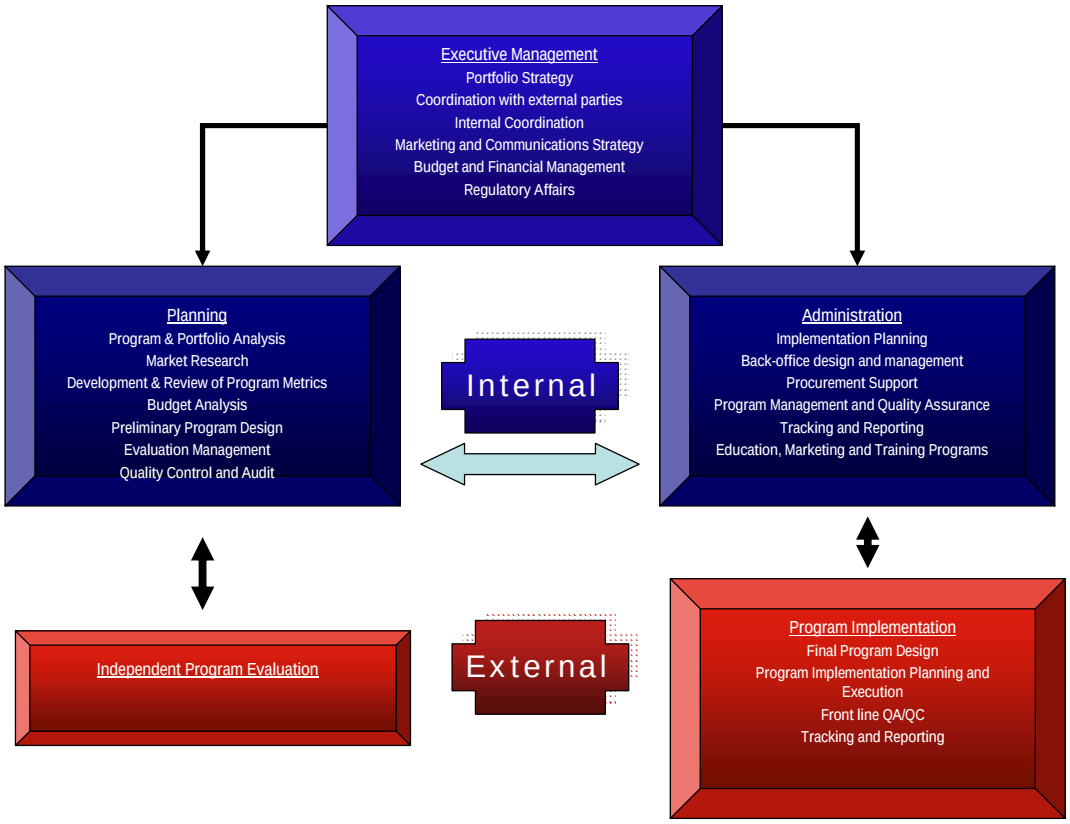
In addition to the required independent evaluation of portfolio of energy savings, the Company will implement an internal quality assurance system to ensure that financial incentives are paid only for those projects that are expected to yield verifiable energy savings. This process will include Company review of any incentive over a specified amount, and on-site verification of a sample of projects for each program. Implementation contractors will be responsible for maintaining an ongoing verification process and for documenting the results.

Finally, the Company will conduct ongoing process assessments of its programs to ensure continuous improvement. The Company will develop specific performance metrics for each program and program element and use reports from the tracking system to compare performance against these metrics, where necessary designing programs and implementation strategies.

1.6. Portfolio Management

Successful implementation of the Plan relies on an effective and efficient process for managing several key functions at the level of both the individual programs and the portfolio level. The following figure describes these functions which are identical to those described in the Company's electric energy efficiency and demand-response plan. In fact, the Company expects that a number of functions can effectively be integrated across plans with proper cost accounting.

Figure 2: Portfolio Management Functional Structure



Internal executive, planning and administrative functions are obviously closely linked. However, some separation between planning and administration is important to ensure arm's length quality control and auditing.

2. Introduction

On November 2, 2007, the Company filed natural gas rate cases for each of the three Ameren Illinois Utilities with the Illinois Commerce Commission. Company testimony in those filings committed the Company to filing a natural gas energy efficiency plan. Several objectives supported this commitment. The first is that the Company believes that energy efficiency programs can deliver significant value to customers through reduced bills. Second, the Company was poised to file an electric energy efficiency and demand-response plan as required by Illinois law. The Company's view, shared by many stakeholders, was that a portfolio of electric-only energy efficiency programs would create lost opportunities to help our customers take comprehensive energy efficiency actions.

This natural gas energy efficiency plan is designed to stand on its own. The analysis supporting the proposed portfolio intentionally is based only on natural gas savings and the costs to achieve those savings. The initial program designs are intended to be free-standing. Nevertheless, we believe that these programs can be delivered less expensively per unit of energy saved, and more effectively in terms of customer service and overall consumer savings if they can be operationally integrated with our proposed electric energy efficiency programs. Upon approval of this Plan, we propose to work with stakeholders and Commission staff to develop the management and accounting protocols that would enable us to pursue integrated delivery while ensuring proper cost accounting and recovery.

This Plan is not driven by explicit statutory spending and savings targets. Rather, the Company has reviewed the practice of other utilities and developed estimates of reasonable budget and savings targets. These targets are shown in the accompanying table.

Table 3. Gas Energy Efficiency Plan Proposed Funding and Savings Levels

	2009	2010	2011
Proposed Funding Level ($millions)	$4.0	$5.0	$6.5
Proposed Gas Reduction Target (therms)	1,084,516	2,172,110	3,266,269
Proposed Gas Reduction Target (percent)	0.1%	0.2%	0.3%

2.1. The Planning Context

Pursuit of these targets takes place in an environment characterized historically by the absence of consistent substantial utility investment in energy efficiency. Consumer understanding of energy management options is generally considered to be lower than in areas of the country exposed to sustained funding and active consumer awareness campaigns. Much of the infrastructure required to mount an aggressive energy efficiency investment program remains to be built.

The Ameren Illinois Utilities' natural gas service territory spans much of the state and is characterized by much lower population density than is found in Northern Illinois, smaller urban centers with lower concentrations of dense commercial space, and multiple media markets. Program implementation structure must be distributed geographically and will not offer the same economies of scale as would be possible in a denser urban environment. Customer awareness-building and outreach activities must be worked through more media channels, each with limited reach. These are issues common to both natural gas and electric energy efficiency planning in the AIU territory.

Unique to natural gas energy efficiency planning is the challenge of limited energy efficiency opportunities. The natural gas energy efficiency potential is concentrated in fewer end uses and technologies than is the case for electric energy efficiency. Essentially, 100 percent of residential savings potential lies in either space heating (82%) or water heating (18%). The only ways to capture this potential are to improve or replace heating systems or reduce heating loads. Most options producing the biggest impact in terms of gas savings are relatively more expensive than is the case for electric energy efficiency measures. For example, the largest reservoir of electric energy efficiency potential in the residential sector is in lighting, and the most effective energy efficiency option is replacing incandescent light bulbs with relatively inexpensive compact fluorescent lamps (CFLs). Unfortunately, there is no analog to CFLs on the gas side, and fewer energy efficiency options means that any given option or measure has increased importance.

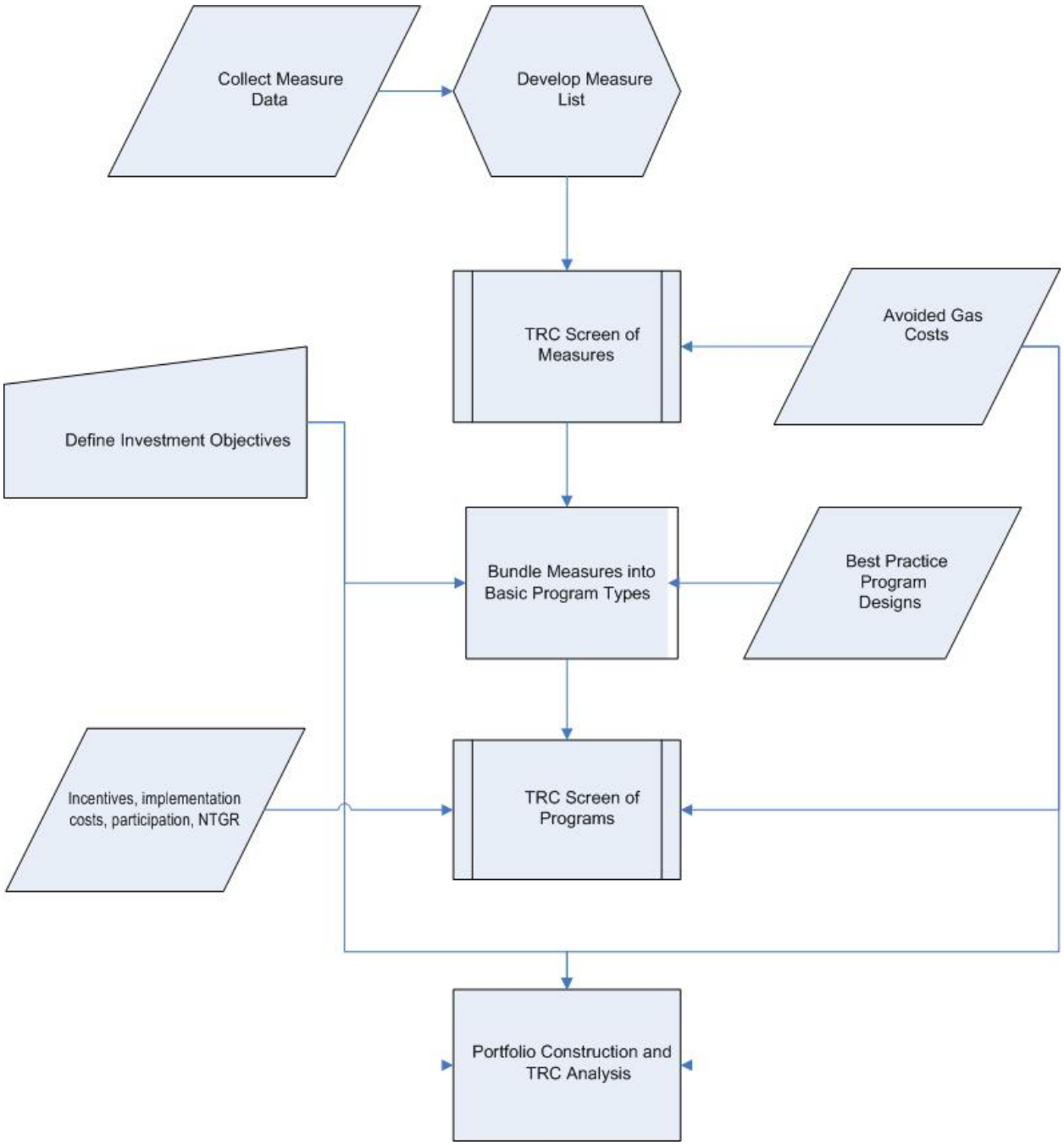
Our immediate challenge is to begin from what is essentially a cold start and quickly build the infrastructure required to meet the first three year targets. Delivering sustained value for customers means that we first must prove over the next three years our ability to design and manage effective programs. This puts a premium on development of a relatively compact portfolio of programs with straightforward, efficient, and proven designs that can be taken to the market quickly and reliably.

2.2. The Planning Process

2.2.1. The Analysis Process

The portfolio proposed by the Company is the product of a multi-stage analysis process intended to gather and process the information required to determine program and portfolio cost-effectiveness. ICF International was retained to provide support for the analysis. The Company's portfolio was designed to satisfy a set of specific investment objectives for its portfolio based on a comprehensive bottom-up analysis of energy efficiency measures, best practice program designs and best estimates of program and portfolio costs and participation based on a review of other utilities' experience. The planning process is illustrated in Figure 3. This process is described in greater detail in Appendix A. The process is summarized below.

Figure 3: Demand-Side Analysis Process



Cost-Effectiveness Defined

The standard for cost-effectiveness typically is the total resource cost (TRC) test as it is defined by the California Standard Practice Manual, developed by the California Public Utilities Commission (CPUC). The test was designed by the CPUC to account for all costs and benefits

reasonably expected to accrue as the result of the implementation of a demand-side program. The general form of the TRC as defined by the CPUC is as follows:

TRC = Benefits/Costs

$$BTRC = \sum_{t=1}^{N} \frac{UAC_t + TC_t}{(1+d)^{t-1}} + \sum_{t=1}^{N} \frac{UAC_{at} + PAC_{at}}{(1+d)^{t-1}}$$

$$CTRC = \sum_{t=1}^{N} \frac{PRC_t + PCN_t + UIC_t}{(1+d)^{t-1}}$$

Where:

BTRC=Benefits of the program

CTRC=Costs of the program

UAC_t=Utility avoided supply costs in year t

UIC_t=Utility increased supply costs in year t

PRC_t=Program Administrator (Utility) program costs in year t

PAC_{at}=Participant avoided costs for alternative fuel in year t

UAC_{at}=Utility avoided supply costs for the alternate fuel in year t

TC_t =Tax Credits

PCN_t =Net Participant Costs

The second term in the benefits equation represents the non-gas savings that might result from the implementation of a program designed primarily to save natural gas. For example, UAC_{at} could represent the electricity savings that would be realized in a home as the result of implementing energy efficiency measures intended to reduce the home's heating load. A common and potent energy efficiency measure is the sealing of a home's heating and cooling ducts to reduce losses. While a gas utility would be interested in this measure as a way to reduce heat load and gas consumption, the measure also would reduce cooling load during the summer, thus saving electric energy as well.

When these other fuel savings are included in the TRC test, the net result typically is that energy efficiency measures that affect a building's heating/cooling load are more cost-effective. In some cases, measures that would not be cost-effective when considering only electric or only gas savings become cost-effective when both sets of savings are considered.

Consistent with the analysis undertaken in support of the Company's electric energy efficiency plan, the cost-effectiveness analysis used for this plan only considers the value of gas savings. The general form of the TRC test used for this plan, therefore, is:

$$BTRC = \sum_{t=1}^{N} \frac{UAC_t}{(1+d)^{t-1}}$$

$$CTRC = \sum_{t=1}^{N} \frac{PRC_t + PCN_t + UIC_t}{(1+d)^{t-1}}$$

Overview of the Analysis

An important source of data for the analysis of energy efficiency measures was the Database of Energy Efficiency Resources (DEER) maintained by the California Energy Commission. This database is recognized as the most comprehensive and consistent database of such measures and regularly updated. Energy efficiency measure savings and costs for measures not affected by local climate were taken in most cases directly from this database.

The savings associated with many measures, however, are affected by local climate. For example, the savings associated with an efficient furnace or building insulation are directly related to the weather conditions experienced in a particular area. The savings associated with these measures were estimated using the DOE-2 building energy simulation model.

For the residential sector, the building energy simulation used a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location.

Approximately 50 measures were assessed for cost-effectiveness using the form of the Total Resource Cost test outlined above. The number of measures is much lower than the number considered for the electric energy efficiency plan for two reasons. First, the analysis here was focused on the residential and small business market segments. Therefore, the analysis did not consider a wide range of measures that might be applicable to industrial processes or to medium or large commercial customers. Second, because significant savings potential is found in only two end uses (space and water heating), there simply are fewer energy efficiency measures available to consider. Avoided costs were provided by the Company and represent the forecasted cost of gas used in estimating the Company's purchased gas adjustment. An assumed cost of carbon was added to this price to reflect that avoiding the purchase of gas through an energy efficiency program not only avoids the cost of that gas, but also the carbon emissions that would have been associated with the combustion of the gas. The assumed cost of carbon dioxide (CO_2) was $15/ton. The cost per ton was factored into the total avoided gas costs using an emissions factor of 5.34 kilograms of CO_2 per saved therm, based on the Intergovernmental Panel on Climate Change (IPCC) default value. The product of these factors came to an estimate of $0.080/therm in nominal annual terms. Table 4 and Table 5 show the aggregate results of the measure screening.

Table 4: Results of the Measure Screening

	Total # of Measures	# Passing TRC
Residential	37	27
Small Commercial	9	4
Totals	46	31

Table 5: Measure Types Passing the TRC Test

Residential Measures	Small Business Measures
Efficient Furnaces	Efficient Boiler
Ceiling & Wall Insulations	Efficient Furnace
Low Flow Shower Heads	Pre-Rinse Spray Valve
Faucet Aerators	Gas Fryer (Restaurant)
ENERGY STAR New Home	Gas Griddle (Restaurant)
ENERGY STAR Dishwasher	Boiler Reset

Measures passing this cost-effectiveness screen were then bundled into programs. Incentive, program implementation, and marketing costs were estimated based on similar programs implemented by other utilities. Participation rates for each program were also estimated based in-part on other utility program experience and on the Company's assessment of reasonable levels of participation given the composition of its market.

The product of per unit measure savings and the number of measures adopted (governed by the program participation rates) yields an estimate of annual gross savings. These savings must be adjusted to reflect the program net-to-gross ratio (NTGR). The NTGR addresses the following program phenomenon:

- Some customers who participate in a program, i.e. receive incentives for participation, would have installed the measures for which they received the incentives even in the absence of the program. These customers are known as "free riders" and the savings that result from their actions must be subtracted from gross savings.
- Some customers are influenced to install measures for which program incentives are available, but do not claim such incentives. This is known as the "spillover" effect. A combination of program advertising, changes in the product mix of retailers as a result of programs, and word-of-mouth can lead to customers investing in energy efficiency without being prompted by program incentives. Savings associated with the spillover effect should be added to gross savings.

  The combined effect of free-rider-ship and spillover is reflected in what is called a "net-to-gross" (NTG) ratio; a factor that is applied to an estimate of gross savings to derive the net level of savings that can be attributed to a program. Estimates of a program NTG ratio present some of the most difficult and contentious issues in energy efficiency program

evaluation, and considerable uncertainty surrounds any given estimate. Our analysis of program cost-effectiveness is based on net program savings estimated using net-to-gross ratios included in the California Public Utilities Commission Energy Efficiency Policy Manual and the DEER database. These ratios are based on over a decade of evaluated program impacts and are the most consistent set of such data available.

Once program data were compiled, each program was screened for cost-effectiveness using the TRC test. Even though the programs were constructed using measures that passed the simplified test, the addition of program costs rendered some programs not cost-effective. Only those passing the TRC test at this stage were included in the final portfolio. Finally, portfolio-wide costs associated with portfolio planning and administration, evaluation, awareness building, and education and training not associated with a specific program were added. The entire portfolio was then screened for cost-effectiveness.

2.2.2. The Collaborative Process

One important objective guiding the development of this Plan was to involve stakeholders in the process and to brief them throughout with respect to the results of the analysis and proposed portfolio. The following workshops were held:

- December 20, 2007 – provided information on the natural gas rate case filing including energy efficiency plan filing and initial gas portfolio concepts. Invitees included the Office of the Illinois Attorney General, Office of Lieutenant Governor, ICC, Citizens Utility Board, DCEO, Environmental Law & Policy Center, Midwest Energy Efficiency Alliance, Energy Education Council, Environment Illinois, Center for Neighborhood Technology, Illinois Clean Energy Community Foundation, AARP, BOMA, Capital Development Board, Department of Natural Resources, Governor's Office, Department of Healthcare and Family Services, Illinois Association of Community Action Agencies, Illinois Environmental Protection Agency, Natural Resources Defense Council, Sierra Club, and The Regulatory Assistance Project.
- January 17, 2008 – provided a preview of the AIU gas portfolio including an update on the measure screening, initial portfolio structure and cost-effectiveness, and proposed natural gas load reductions and budget targets. Invitees were the same as the December 20, 2007 meeting.

The Company is committed to continued engagement with our stakeholders to provide not only opportunities to review our progress, but also to contribute to the continued development and strengthening of the portfolio. Stakeholder meeting attendees were encouraged to provide feedback on the proposed Plan to AIU through e-mail or phone exchange.

2.3. Overview of the Remainder of the Plan

The remainder of this Plan describes the process used by the Company to identify the programs we propose, to provide program design templates for each of those programs, and to outline our proposed approach to managing the acquisition process.

- Section 3 describes the portfolio philosophy underlying the Plan, including a description of key policy and corporate objectives to be served.

- Section 4 includes descriptions of each of the programs the Company proposes to include in its portfolio. These descriptions contain overviews of proposed implementation, marketing and incentive strategies, estimated savings and proposed general budgets. Budgets and savings targets should be recognized as preliminary at this stage. Both will be refined as the program design process is completed and third party implementation contractors are hired.
- Section 5 addresses the Company's proposed approach to evaluation, measurement and verification, including both internal QA/QC and verification as well as our proposed approaches to evaluating program savings.
- Section 6 includes an implementation roadmap, focusing on the series of steps the Company plans to take to finalize program and portfolio design and move programs into the market.
- Section 7 describes the Company's proposed approach to program management.
- Appendices to the Plan contain a more detailed description of the analysis process and supporting data.

3. Energy Efficiency Portfolio Framework

3.1. Introduction

The Company's electric energy efficiency and demand response plan outlined a perspective on portfolio development that likened the efficiency portfolio to a mix of investments corresponding to different objectives and with different risk profiles. The set of natural gas energy efficiency programs that AIU proposes in this Plan should be viewed in similar terms. This section describes the energy efficiency program investment philosophy that has guided selection of the programs proposed. The design of our portfolio framework includes two basic steps: the definition of energy efficiency investment objectives and establishment of a perspective on program and portfolio risk. Investment objectives are set to reflect program performance and customer service criteria.

3.2. Setting the Investment Objectives

The principle underlying the development of its proposed gas efficiency portfolio is that the AIU should offer customers effective solutions for managing their energy service. We believe that the fact that we provide both gas and electric service, often to the same customers, creates a unique opportunity to offer more effective efficiency solutions if we can offer both gas and electric energy efficiency programs. We recognize that our customers have faced rising energy bills over the past several years and believe that providing these customers with a broad array of energy efficiency solutions is a sound and essential part of our business.

Beyond this core principle several sets of objectives define the energy efficiency investment environment.

- Include all Measures that Screen as Cost-Effective: To ensure that the Company's portfolio includes a wide range of program options for its customers, it includes all measures that it has screened as cost-effective using the Total Resource Cost test.

- Provide Coverage of Hard-to-Reach Sectors: Energy efficiency programs that are intended principally to "acquire" conservation resources typically target the most accessible and cost-effective pockets of energy efficiency potential. Although these programs might be designed to allow all customers to participate, certain market segments invariably are "hard to reach". Low income customers, renters, small businesses, and not-for-profit organizations often face barriers to participation in energy efficiency programs that are more severe or complex than those addressed by mainstream energy efficiency programs. An explicit objective of this Plan is to ensure availability of some program services for these hard-to-reach customers.

- Inclusion of Some Educational/Informational Elements to Promote Changes in Long-term Customer Behavior: A prudent investment strategy should lay the foundation for gradual transformation of demand-side markets. This transformation envisions informed customers acting on market signals to manage their energy use consistent with their interests. It envisions that market signals accurately reflect the real costs of consumption, that these signals reach consumers in ways that can be understood and acted upon, and that consumers have ready access to the technology needed to manage energy use. Although these early investments in education, information, training and technical assistance might not yield easily quantifiable energy savings today, they provide essential support to programs that aim to acquire measurable

savings and they are the foundation for the desired market transformation. We see these activities as being particularly valuable in:

- Strengthening the capacity of downstream efficiency product and service suppliers to successfully sell energy efficiency;
- Moving target customer segments from awareness to action by providing focused information, technical assistance and training; and

Where appropriate, market preparation elements have been built into each program design.

- Strengthen Customer Service: Implementation of this Plan provides an important opportunity to re-establish and strengthen relationships with consumers and energy efficiency product and service suppliers. Customers often look to the Company as a source of credible information regarding energy efficiency, and it is crucial that we design and deliver programs that fulfill or exceed these expectations.

- Ensure Portfolio Flexibility: The portfolio of programs included in this Plan is the one that the Company believes will deliver the greatest value to its customers. The portfolio is based on consideration of the risks associated with design and implementation of programs and a balancing of technologies, programs and market segments intended to manage these risks. However, the Company also believes that it is essential to retain the flexibility to rebalance the portfolio as it gains implementation experience. Initial assumptions regarding customer response to specific programs will be tested and improved which likely will require that programs be modified, added or discontinued. The portfolio has been designed to include several programs that can be quickly ramped up or down based on market response.

- Employ Best Practice Portfolio and Program Design: “Best Practice” often is an imprecise characterization of a complex mix of experience, practice, and environment that together yield outcomes widely recognized as superior. The recipe for program success is one part good design and two parts good execution. Neither of these ingredients is entirely portable—a best practice program inevitably contains locational or sponsor idiosyncrasies that have contributed to its success. Finally, what is best practice for a utility that has been designing and managing programs for two decades will be different in some cases from what should be viewed as best for an organization just entering the field. The energy efficiency portfolios managed by utilities with long experience tend to be characterized by narrower market segmentation, more complex delivery structures, and a larger number of programs. Attempting to replicate these portfolios would be extremely challenging for the Ameren Illinois Utilities as it begins an energy efficiency investment program. The Company has designed a portfolio intended to reach a cross-section of its market using a compact set of proven program designs. Our aim is to firmly establish the infrastructure to deliver cost-effective energy savings and to use that infrastructure to support innovation over time.

- Develop program designs that enable integration with proposed electric efficiency programs. Although this gas energy efficiency plan is designed to stand on its own, we believe that its impact and effectiveness will be greater if program marketing and delivery can be linked, where appropriate, with electric energy efficiency programs targeting the same market segments.

3.3. Managing Program and Portfolio Risk

Portfolio risk is defined as the likelihood that the portfolio will fail to deliver on its objectives. The way in which risk is managed depends on three factors: (1) The Company's risk tolerance—in this case its tolerance for falling short of the 2009, 2010 and 2011 gas reduction targets; (2) The relative riskiness of the programs included in the portfolio; and (3) The portfolio design elements used to mitigate and balance individual program risk.

- **Risk Tolerance.** The Company is committed to meeting the gas consumption reduction targets outlined in this Plan. Although these targets are not defined by statute, our tolerance for the risk of not meeting them is low. This creates a preference for a core of programs with relatively standard and straightforward program designs, high historic net-to-gross ratios and a track record of successful implementation in other jurisdictions.

- **Program Risks.** Close to 20 years of experience with energy conservation program design and implementation yields valuable information about the relative success of different types of programs. This experience shows that certain types of program delivery, with certain types and levels of incentives have relatively less variability in performance. At the same time, these program types cannot easily be applied in all market segments. The nature of program risks is different for gas programs due to the concentration of savings potential within two end uses and the lower number of program options.

- **Risk Mitigation.** The same experience that illustrates the relative riskiness of program types also suggests a range of methods for mitigating and managing these risks. For example, program implementers increasingly are being asked to assume a larger share of performance risk by tying payment to delivered savings. In other cases, where risks are closely associated with being able to influence a mass market, risk can be mitigated to some extent by moving the program focus upstream to retailers, distributors or manufacturers where greater control over performance can be exercised.

There are four types of risks that must be accounted for:

- **Performance risk.** The risk that, due to design or implementation flaws, the program does not deliver expected savings. This risk is common to all program types.

- **Technology risk.** The risk that technologies targeted by a program fail to deliver the savings expected. This risk is concentrated in programs that target emerging technologies; systems that are aggregates of specific technologies, and/or systems in which energy use is strongly influenced by external factors (e.g. customer behavior, economic conditions, etc).

- **Market risk.** The risk that, either because of a poor economic climate or the availability of better investments, customers choose not to participate in a program.

- **Evaluation risk.** The risk that independent EM&V will, based on different assumptions, conclude that savings fall short of what the implementers have estimated.

Typically, the first three types of risk are dealt with, first, through program design intended to minimize risk within a program and, second, by ensuring that the portfolio contains a mix of program types (different services, delivery mechanisms, providers, incentive types and levels, etc.) sufficient to avoid over-reliance on any one approach, technology or market. However, the ability to diversify as a mitigation strategy is muted with gas energy efficiency programs simply because there are fewer energy efficiency options.

Evaluation risk is addressed by commencing evaluation activities at the same time as programs are designed. Thus, evaluation protocols are understood by all parties at the outset, and the evaluation process is continuous as opposed to ex-post, allowing the Company and program implementers to adjust design and delivery to real-time information from the evaluators. This approach views evaluation not only as an independent verification of performance for regulatory purposes, but also as a vital input to a continuous process of program improvement.

3.3.1. Managing Risk over Time

Risk is also influenced by time. In the case of market risk, for example, risk increases as the implementation horizon expands, the longer the horizon, the more the economy and markets can change from what is assumed during the initial program design stage. In other cases, technology risk tends to decline over time as performance characteristics become better understood. Finally, programs will gain market traction at different rates; some are capable of acquiring savings relatively quickly, while others require more market development. Program management efficiency is optimized when programs create a relatively smooth profile of savings over time. Therefore, it is important to balance the risks inherent in late-developing programs with programs that can deliver quick and sustainable efficiency gains.

Each of these phenomena argue for a portfolio that is both balanced with respect to time and market dynamics in the sense that it can be easily modified if experience and market conditions suggest new opportunities or existing designs are not effective. The portfolio that we propose in this Plan should be viewed as the Company's initial best effort at designing a set of programs that will satisfy the objectives outlined above. Early success reduces the risk that the target demand reduction will not be met and increases program design and management flexibility. The portfolio also includes a variety of resource acquisition and market preparation programs that have slower development rates. Although these programs might carry relatively greater risk, they also embody substantial value with respect to the objectives outlined above. The risks themselves can be hedged by fast-start programs and by the ability to rebalance the portfolio over time based on feedback from program evaluation.

3.4. Applying the Framework

Table 6 distills the portfolio objectives we have used and illustrates how those objectives translate into specific design parameters and program elements. The first column recaps the portfolio objectives described above. The second column describes how those objectives influence the general structure of the portfolio, and the third column suggests how these portfolio design parameters shape specific program elements.

Table 6:
Portfolio Objectives, Design Parameters, and Design Elements

Objective	Portfolio Design Parameters	Program Design Elements
Include All Measures that Screen as Cost-effective	• Conduct broad screening of measures by building type and end use. • Bundle measures into consistent program shells designed to maximize delivery efficiency.	• All programs passing TRC test have been included in the portfolio.
Provide Coverage of Hard-to-Reach Sectors	• Portfolio should include, at a minimum, elements aimed at serving low income residential customers. • Small business is a second hard-to-reach sector	• Programs are being targeted at residential and small businesses • Special focus on not-for-profits and churches within the small business sector
Inclusion of Some Educational/Informational Elements to Promote Changes in Long-term Customer Behavior:	• Market preparation activities should be used where they (1) can help boost acquisition program effectiveness (2) are an essential element of an acquisition program and/or (3) help ensure sustainable market activity.	• All program designs should address the need for specific market preparation activities (e.g. trade ally training programs, awareness-building, etc).
Strengthen Customer Service	• Program designs should incorporate customer input, include branding, and link delivery to customer service functions.	• Employ customer focus groups during final program design phase. • Ensure program designs incorporate links to the Company's customer service functions. • As possible link marketing and delivery of gas and electric programs
Ensure Portfolio Flexibility	• Seek diversity across technologies and markets • Balance the need for broad coverage and minimizing administrative complexity through too many programs • Analyze portfolio risk and hedge against over-reliance on one program or technology.	• Focus on broad designs that incorporate a wide range of measures and market segments.
Employ Best Practice Portfolio and Program Design	• Aim for initial portfolio compactness in start-up phase • Perform risk analysis to identify portfolio vulnerabilities	• Aim for simple, broad program designs that minimize delivery complexity • Design programs from the customers' perspective
Develop program designs that enable integration with proposed electric efficiency programs	• Follow consistent measure bundling and program design philosophy as was used for electric energy efficiency plan	• Program designs for key measures (HVAC and home performance) are consistent with electric energy efficiency designs

4. The Ameren Illinois Utilities' Portfolio

This section introduces the programs that the Company proposes to include in its initial gas energy efficiency portfolio, and describes the design philosophy and process that were used to select them. This portfolio should be viewed as the Company's starting point, with an expectation that it will evolve based on more detailed implementation planning and program experience. Accordingly, the Company requests that it be given the flexibility to reallocate funding among programs consistent with the performance of the programs to ensure that it is able to meet its energy savings targets within the budgets proposed using cost-effective programs.

The Company is committed to meeting its objectives at minimum cost, requiring an efficient design, implementation and administration process. Toward this end, the Company applied several specific design guidelines, all of which derive from our focus on this commitment. These guidelines include:

- Minimizing the number of program offerings to reduce the costs of program administration and the market confusion that can arise from too many program requirements.
- Minimizing program design complexity in the interests of speeding time-to-market, reducing administrative costs, and encouraging participation.
- Retaining design flexibility to enable (a) program implementers to adjust specific designs as dictated by customer response, and (b) the Company to rebalance the portfolio based on individual program performance and emerging opportunities.
- Maximizing the resource acquisition elements of the Plan. Although a number of the Company's proposed program designs incorporate market preparation activities, the aggressive ramp-up schedule and the relatively tight budget places a premium on programs designed to deliver energy efficiency resources. We have included market preparation activities that we believe provide essential support to the proposed acquisition efforts, and that position the portfolio for future years.

4.1. Initial Program Set

Using the measure and program screening process outlined in Section 4, the Company screened the following program elements:

Table 7: Initial Program Concepts

Residential Energy Efficiency Solutions	
Home Energy Performance	Whole house combined direct install and rebate program for gas-heated homes.
Residential Appliances	Rebates for efficient appliances that use hot water.
Residential Multi-family	Comprehensive suite of gas energy efficiency measures; direct installation of low-cost measures.
Residential Low Income	Comprehensive whole-house program linked to existing weatherization programs.
ENERGY STAR New Homes	Incentives to builders for construction of ENERGY STAR new homes – focus on builder marketing support.
Residential New HVAC	Incentives for installation of new gas furnaces exceeding federal standards, as well as for proper installation of the units.
Business Energy Efficiency Solutions	
Small Business Food Service	Program targeting foodservice businesses to replace a typical spray valve that flows up to three gallons of water per minute (gpm) with a low-flow unit can reduce hot water use by up to 250 gallons per day and cut gas use by up to 2 therms per day. Under this program, the Company or its contractor would provide for direct installation of pre-rinse sprayers in food service establishments. In addition, the program would provide incentives for efficient gas-fired cooking equipment.
Small Business Tune-Up	A variety of HVAC tune-up and controls measures are cost-effective based on gas savings alone. This program would provide incentives for a range of gas space heating equipment installed in small business establishments. The program will include targeted outreach to not-for-profit organizations and churches.

All programs with the exception of the Residential Appliances and Residential Low Income programs screened as cost-effective. With respect to the Residential Appliances program, dishwashers were the only measure that screened as cost-effective, and savings were not large enough to support the addition of program costs. This program, therefore, was dropped from further consideration. Although the Residential Low Income program had a benefit-cost ratio less than 1.0, the Company considers this an important element of its portfolio, and proposes to include the program.

Utility gas energy efficiency portfolios tend to be more compact than those for electricity given the limited number of efficiency options. In addition, because the Company is focused on residential and small business customers, more complex programs associated with large buildings and industrial processes are not part of the portfolio. Although portfolio design typically tries to minimize segmentation and instead promote broad offerings, the Company has developed one program element targeted at a specific small business sector; the Small Business Food Service program element. The food service market segment offers the greatest gas-saving potential within the small business market due to the high hot water loads in restaurants, and separating this program element from others enables a more focused marketing and delivery approach. The programs that remain in the Company's proposed portfolio incorporate all measures screening as cost-effective and can easily incorporate additional measures should others be found cost-effective. As the Company gains experience with program implementation and gathers additional market intelligence, additional program designs will be considered.

In addition to the demand reduction programs described above, the Company believes that an effective portfolio must include some market conditioning programs. Such programs typically

cannot be associated with direct energy savings but nevertheless help build the foundation for energy saving programs through education, training, technical assistance and awareness-building. The Company also proposes to allocate some budget to the inclusion of natural gas efficiency information in the suite of knowledge- and capacity-building programs proposed under the electric energy efficiency plan to facilitate market transformation. Education, training and awareness-building are essential elements of the portfolio, without which the investment yields little/no permanent change. Thus the Company will both design and implement cross-cutting education and training programs. Initially, the Company will introduce the web-based on-line energy auditing tool that ultimately will serve as a portal to the Company's residential program elements. The Company will also incorporate program element-specific education, training and awareness building activities into each program as appropriate. While spending in these may not yield measurable near-term efficiency gains, they will be critical to long term program success.

4.2. Proposed Programs

4.2.1. Portfolio Summary

The following table summarizes the Company's' proposed portfolio.

Table 8: AIU Natural Gas Energy Efficiency Portfolio Summary

Market	Program Name	TRC Test Results	2009		2010		2011	
			Therm Savings	Cost ($M)	Therm Savings	Cost ($M)	Therm Savings	Cost ($M)
Residential	Home Energy Performance	2.85	587,829	$ 1.3	793,569	$ 1.7	881,744	$ 1.9
	ENERGY STAR New Homes	1.24	13,327	$ 0.1	15,530	$ 0.1	17,789	$ 0.1
	Residential Multifamily	1.21	47,586	$ 0.2	95,172	$ 0.5	142,758	$ 0.7
	Residential Low Income	0.94	19,232	$ 0.2	24,040	$ 0.3	31,253	$ 0.4
	Residential New HVAC	2.39	349,399	$ 0.5	698,798	$ 1.1	1,048,197	$ 1.6
Small Business	Small Business Tune-up	1.48	29,690	$ 0.1	59,379	$ 0.2	89,069	$ 0.2
	Small Business Food Service	6.89	359,210	$ 0.2	718,420	$ 0.4	1,167,433	$ 0.6
	Portfolio Level Costs			$ 0.6		$ 0.8		$ 0.9
	Projected Annual Totals	2.35	**1,406,273**	**$ 3.2**	**2,404,909**	**$ 4.9**	**3,378,241**	**$ 6.4**

Consistent with best practice program design principles and our proposed electric energy efficiency plan, the Company has designed two broad solutions-based programs, each of which will have multiple program elements. Our objective is to offer customers a suite of options to meet their energy management needs, rather than forcing customers to sort through a variety of individual programs. Grouping program elements under these solutions-based umbrellas also enables the Company to design sector-based branding, marketing and awareness building initiatives that encourage customers to take action to manage their energy service needs rather than trying to promote participation in a variety of individual programs.

4.2.2. Residential Energy Efficiency Solutions

The Residential Energy Efficiency Solutions program offers options for residential customer energy management, focused on reducing gas used for space and water heating. The program will allow a set of home solutions, while providing multiple points of entry to the services offered by the Company. This program will be intertwined with the Company's education and outreach efforts, and specifically with the roll-out of a web-based audit tool, such that the program not

only offers immediate savings in this first program cycle, but also lays the foundation for a more energy-aware population in the Ameren Illinois Utilities service territory. The program will adapt over time from an initial focus on individual technology-based solutions to a more comprehensive focus on whole-home solutions that can offer customers the greatest long-term value.

Coupled with the outreach and education efforts, the program is intended to position the Company as customers' *partner* in home energy efficiency improvement. Note that the incentive, savings and participation estimates presented for each program have been rounded and, therefore, will not match the total budget and savings targets reported in the templates.

PROGRAM	Home Energy Performance
Objective	To offer comprehensive retrofit packages for customers considering energy efficiency improvement for existing single family homes.
Target Market	Existing single-family homes heated with natural gas that otherwise are not eligible for participation in the Residential Low Income program.
Program Duration	Initial program implementation period is three years, commencing in January, 2009 and ending in December, 2011. Assumed that the program will continue throughout the planning period.
Program Description	Home Energy Performance is a home diagnostic and improvement program that, ideally, can be effectively integrated with the electric home performance offering proposed in the Company's electric energy efficiency plan, enabling the Company to deliver a complete suite of energy efficiency services to a home. If this integration can be accomplished with appropriate cost accounting, the program can be branded as Home Performance with ENERGY STAR. This, in turn, will enable the Company to leverage substantial marketing collateral and existing brand awareness in its outreach to contractors and customers. An implementation contractor will be retained to market home energy improvement services, based on the provision of a range of specific measure incentives, including direct install measures (low-flow showerheads and faucet aerators.) The contractor will provide an energy audit, and will arrange for installation of insulation measures as warranted by the audit. During the initial implementation period, the implementation contractor will work to identify and train local firms that can provide comprehensive diagnostic and improvement services.

Implementation Strategy	The key to successful implementation is to effectively link this program with the gas and electric Residential New HVAC programs, and the electric Home Energy Performance program. A role of the implementation contractor will be to coordinate delivery of the services warranted by the home energy assessment. The key implementation steps include: o Development of final detailed program design, including incentive forms, policies and procedures, training materials, marketing collateral and so forth. o Selection/development of appropriate home energy analysis software. The software must be capable of storing and downloading each analysis to enable tracking and verification. o Contractor recruitment. The implementation contractor will recruit insulation/weatherization contractors as program allies. Subject to attending a brief training session and execution of a participation agreement outlining program terms and conditions, including pricing, the contractors will be included on the list of contractors to be used for customer projects. The contractors will be rotated through the projects to ensure fair access. o Customer recruitment. The first 3-year implementation phase will involve direct marketing to customers using phone, direct mail, print ads, radio spots, bill stuffers, door hangers and the Ameren Illinois Utilities' (the Company) web site. o Home energy survey. The implementation contractor or subcontractors will provide energy assessments for interested customers, with the audit cost subsidized by the program. During the audit, the contractor will install faucet aerators, low flow showerheads, and hot water pipe insulation. The audit will be designed to estimate potential energy savings due to infiltration and heat loss through walls and attics. In addition, if a gas furnace is present, the assessment will include identification of the age and size of the unit and the last service date. Ideally the audit software enables an onsite report (likely depends on the availability of utility bills). The report will be presented to the customer with recommendations for upgrades, and information about available rebates. o Upgrades. If the customer elects to proceed with any upgrades, the implementation contractor will arrange for the appropriate contractor to contact the customer for installation and provide instant rebate coupons that can be used at time of installation. If the customer wishes to self-install air sealing and insulation, he/she may submit a mail-in rebate application with proof of purchase. o Incentive fulfillment. The contractor installing the measures or making HVAC improvements will submit the instant rebate coupon from the customer along with a copy of the original invoice to the customer and a customer acceptance signature. Subject to verification, the implementation contractor will pay the incentive to the contractor. Mail-in rebates will also be available for those customers that self-install measures. o Verification. The first 5-10 projects performed by each contractor will be site-verified, with random verification thereafter.
Exit Strategy	This is a potentially complex program carrying the associated higher performance risk. It also is a program that can take a longer period to ramp-up to steady-state production. The exit strategy should be formed around the metrics outlined below. Withdrawal from the market should not cause major disruption. One ancillary objective of the program is to encourage the development of a home performance contracting industry and early withdrawal of the program could stunt the growth of that industry.
Marketing Strategy	"Call to action" marketing campaign using radio, newspaper, direct mail, co-op advertising, public relations, and special events held in conjunction with home improvement retailers. This program would involve some of the most expansive marketing within the portfolio given the need to reach the mass market.

Eligible Measures and Incentive Strategy

Because there are multiple pathways to home energy improvement, the program will need to adopt a multi-faceted incentive structure. These include:

- Customer rebate coupons to use in conjunction with contractor-installed measures
- Mail-in rebates associated with customer self-install air sealing and insulation measures

The general incentive levels currently envisioned are as follows. Note that most of these incentive levels vary from those for similar measures proposed as part of the all-electric home energy performance program. The reason for the difference in most cases is that for planning purposes, incentive levels are set at the level required to yield a one year post-rebate payback. Because electricity is more expensive as a water and space heating energy source, measures that reduce electricity use have a lower pre-rebate payback period and, therefore, require a lower incentive to achieve the same post-rebate payback. If the gas and electric home energy performance programs are managed as a single program, the incentive levels should be equalized.

Incentives

Measure	Incentive per Unit
Ceiling Insulation (R-30)	$130
Ceiling Insulation (R-38)	$200
Duct Leakage 5%	$100
Faucet Aerators	$10
Hot Water Insulation	$20
Hot Water Pipe Insulation	$160
Increase duct sizes or add new ducts	$480
Infiltration = 0.35 ACH	$110
Low Flow Shower Heads	$9
Low-e Double Pane Windows	$190
Programmable Thermostat	$10
R-11 Wall Insulation	$0.30/ft^2 **

** Wall insulation incentive levels likely would be capped in the range of $500-$600.

Milestones

October 2008: – Complete detailed implementation plan

November 2009: – Program soft launch – recruiting of contractors; initial marketing

January 2009: – Full launch

EM&V Requirements	The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses evaluation resources on the programs with the most savings and the highest risk of inaccurate ex ante estimates. This program focuses on installing low-cost no-cost measures and incenting higher cost measures as recommended by an on-site energy audit. The evaluation effort will employ two separate but coordinated strategies associated with the level of services received. For the low-cost no-cost direct install services that cannot be picked up in a billing analysis, the evaluation will review the program tracking system and the audit reports to identify installed technologies and environmental conditions associated with energy consumption (water temperature, showers or baths per day, energy-related demographic profiles. etc.). Then the study will use participant interviews to confirm the installation and continued use of the installed measures. The interviews will also include net-to-gross questions to allow the estimation of free riders. The results from the interviews will be used to estimate the savings achieved using home energy modeling approaches linked with and engineering estimation of impacts structured to make use of the interview information. For the more comprehensive measures and higher impact measures that typically require trade ally support, the evaluation will use base-load and weather sensitive billing analysis approaches to identify savings achieved. The analysis will employ the use of a comparison group consisting of new enrollees into the program for the comparison group pre and post-participation period, with the post-program condition being the period after major measures are installed for all participants. The installation and confirmation of the measures will also be confirmed via interviews with the participants. During these interviews environmental and use conditions will be obtained for use in adjusting the results of the billing analysis. The interviews with the participants will also include process evaluation questions on the program and the services provided. In addition the process evaluation will interview program managers and implementation contactors to assess the delivery approach and operations.
Administrative Requirements	As a complex program, this will require a relatively larger administrative commitment from the Company, although resource requirements can be minimized by close coordination with the electric home performance program. As a free-standing program, planning and ramp-up will require .5 - .75 FTE and steady-state program management could require .5 FTE. Although all implementation contracts should include performance provisions, this contract in particular should base payment on the number of customers reached and the level of gross estimated savings to ensure contractor motivation to drive participation numbers which are aggressive. Substantial input from the Company's marketing/communications group will be needed for review of and support for the more intensive marketing effort; trade-mark and brand issues will be more important given the expected use of coop advertising.

Estimated Participation

Measure	2009 Installations	2010 Installations	2011 Installations
Ceiling Insulation (R-30)	160	210	230
Ceiling Insulation (R-38)	200	270	300
Duct Leakage 5%	620	830	920
Faucet Aerators	1500	2000	2200
Hot Water Insulation	1100	1500	1600
Hot Water Pipe Insulation	1000	1400	1500
Increase duct sizes or add new ducts	590	800	890
Infiltration = 0.35 ACH	630	850	950
Low Flow Shower Heads	1500	2000	2300
Low-e Double Pane Windows	150	210	230
Programmable Thermostat	740	1000	1100
R-11 Wall Insulation	220	300	330

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total *	$1,270,000	$1,720,000	$1,910,000	$4,900,000

*Includes contractor training and audit costs.

Savings Targets

The estimated program savings are based on building energy simulation of a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location. The per-unit savings are not additive, but are based on simulations that assume only one specific measure is implemented. The individual measure savings associated with implementation of a bundle of these measures would be substantially lower.

Measure	Units	therms/unit
Ceiling Insulation (R-30)	Home	70
Ceiling Insulation (R-38)	Home	80
Duct Leakage 5%	Home	190
Faucet Aerators	Home	20
Hot Water Insulation	Home	40
Hot Water Pipe Insulation	Home	50
Increase duct sizes or add new ducts	Home	80
Infiltration = 0.35 ACH	Home	280
Low Flow Shower Heads	Home	40
Low-e Double Pane Windows	Home	100
Programmable Thermostat	Home	20
R-11 Wall Insulation	Home	740

Total Savings Targets:

Savings				
Year	2009	2010	2011	Total
Gross Therms	735,000	993,000	1,100,000	2,830,000
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	588,000	794,000	882,000	2,260,000

Program Metrics

Energy savings goals are the primary metrics. The key secondary metrics are the number of audits performed, the number of rebates paid and the cost per therm acquired. The number of audits sets the maximum pipeline flow and the number of rebates paid compared to audits determines the close rate which is key in predicting how the program will perform. Once final budgets and targets are set, baseline metrics can be calculated and deviations of more than 20% per quarter or 10% per year indicate that a formal review of program design/implementation is needed.

Cost-effectiveness

Total Resource Cost Test: 2.85

PROGRAM	Residential Multi-family
Objective	Deliver cost-effective conservation services to the multi-family housing market, targeting comprehensive projects.
Target Market	Owners, managers and developers of market rate multi-family housing (three or more units) under Rate GDS-2. Focus on management companies holding multiple properties.
Program Duration	Initial implementation of January, 2009 – December, 2011. The program is assumed to be continued throughout the planning period. The program will be re-assessed at the end of the first implementation cycle to determine if the program should be continued.
Program Description	The program would provide installation of measures in tenant spaces and whole building improvements including insulation and efficient boilers. More expensive or complex measures (boilers, insulation) would be subject to an energy analysis to validate cost-effectiveness and set incentive levels. The incentives for these measures would be calculated based on therm savings, and subject to a threshold payback period of 1 year. The program would include limited technical services such as walk-through audits to determine approximate measure of cost effectiveness.

Implementation Strategy	This program will be implemented by a third party contractor. However, even within this third party structure there are two different implementation structures. The first uses the implementation contractor to recruit customers, perform technical services such as audits, arrange pricing and assist with arranging for installation contractors. The alternative is to recruit trade allies, negotiate pricing and qualify the contractors, and then allow them to market the program. Incentives would be paid directly to contractors based on proof of performance. Some experience shows that this second approach is more effective in driving actual savings. It does, however, require more vigilant QA/QC. The implementation steps outlined below assume a hybrid model that includes some level of direct outreach to customers. o Set final equipment eligibility and rebate levels, and develop contractor participation agreements. Most of the savings for this program will be achieved through the installation of more efficient boilers, so the incentive structure should be focused on generating activity with boiler replacement. o Recruit trade allies. The program would focus on outreach and insulation and infiltration contractors. Interested contractors would attend brief training sessions at which program rules (eligible equipment, installation standards, liability issues and verification requirements) would be presented. Contractors wishing to participate in the program would be required to sign a participation agreement following the training. This agreement would outline how the contractors are to present the program, installation standards, requirements for logging installations, requirements related to access agreements, etc. Contractors would be provided with basic program collateral describing the program. o Contractors sell the projects without direct involvement from the Program aside from the verification and incentive payment. Customers would be required to agree to provide access to their facilities for verification. o The Program would conduct direct outreach to owners and managers of multi-family properties through direct mailing, with efforts overlapping with the electric multi-family program. These customers could request brief energy surveys of their properties that would be combined with some direct installation of measures. In addition, these customers could directly undertake efficiency improvements with facility staff or a contractor of their choosing. Rebate levels for common measures would be the same, but the program would also provide customized rebates for more complex cost-effective measures. o Monitor installations. The first set of projects performed by each contractor would be site-verified, with random site verifications thereafter to ensure that installations are being performed properly and that equipment is being installed as reported. All projects undertaken directly by the customer would be site-verified prior to payment. o Pay incentives. This program would not use a reservation system. Upon completion of a project, the contractor would submit an incentive application, including Property manager acceptance of the completed project, and documentation of the types and location of installed equipment. Subject to the verification process outlined above, the incentives would be paid by the implementation contractor or the Ameren Illinois Utilities (The Company).
Exit Strategy	Since multi-family projects can involve a longer sales cycle, any exit from this market needs to take into account projects in development. A minimum of three months notice should be provided prior to exit to capture these projects. This program is intended as a resource acquisition program as opposed to a market transformation initiative. Although there is likely to be some transformative effect, there is no natural market exit point based on market share. Similar programs have been run over many years in some jurisdictions without saturation. Program evaluators periodically should examine market effects to assess whether in fact property owners and managers have significantly shifted their buying practices with respect to energy efficient products.
Marketing Strategy	The marketing strategy has two-tracks; one aimed at boiler contractors and the other at property owners and managers. Marketing tactics would include direct mail and phone contact, participation in local meetings of multi-family property managers. The program would be advertised via the Company's web site. Marketing collateral would be limited to a basic program brochure.

Eligible Measures and Incentive Strategy

The general incentive levels currently envisioned are as follows. Note that some of these incentive levels vary from those for similar measures proposed as part of other gas programs including infiltration reduction and hot water reduction measures. The differences are attributable to different incremental measure costs for different housing types and different assumptions about how the program would be delivered (direct installation versus rebate)

Measure	Incentive per Unit
90% Efficient Commercial Furnace (per building)	$910
Faucet Aerators	$10
Hot Water Pipe Insulation (per building)	$130
Infiltration = 0.35 ACH (per building)	$310
MF Efficient Boiler (per building)	$490
Programmable Thermostat	$10
R-11 Wall Insulation	$0.30/ft^2 **

** Wall insulation incentive levels likely would be capped. For purposes of this analysis, a 30-unit complex was assumed with a maximum incentive of approximately $7,000. The Company will work with an implementation contractor to set final incentives that likely will be tied to the number of apartment units.

Milestones

October 2008: – Execute implementation contract

November 2009: – Complete detailed implementation plan

January 2009: – Program soft launch – recruiting of contractors; initial marketing

February 2009: – Full launch

EM&V Requirements	Baseline or market characterization studies will be used to inform the program scope and measure mix selected. Evaluations will be designed to ensure that energy savings meet expectations and that participants are satisfied with installed measures. Will include estimation of free-rider-ship and spillover, and will be conducted at the most comprehensive level possible given time and budget constraints. In unevaluated program years, a basic report describing program activities, budget and expenditures, estimated savings and lessons learned will be developed. The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses evaluation resources on the programs with the most savings and the highest risk of inaccurate ex ante estimates. This program has three independent but coordinated component-focused evaluation efforts that need to be conducted simultaneously. These include: Audits, Direct Installs, and complex heating system and shell improvement measures. The evaluation approach for each component is as follows: Energy Audits The energy audit component will be evaluated using a participant and non-participant survey approach with multi-family (MF) owners and operators to identify the difference between the level of recommended actions taken by participants and non-participants. This approach will automatically net out the net-to-gross factors, as the non-participant actions will represent the normal market behavior in the absence of the program. The energy savings from the actions taken will be reported consistent with standard savings values for basic measures. Where the actions are more complex (building insulation or heating system upgrades), DOE-2 models linked to weather normalized engineering estimates will be developed to represent applied savings. Because of the cost, on-site metering and verification efforts will not be conducted. Low-Cost Direct Installs The direct install evaluation will be based on the coordination of two evaluation approaches. First the program records will be reviewed to extract the listing of the installed measures and the baseline conditions associated with the direct install. These will serve as the platform from which participant surveys will be used to confirm the information in the tracking system, including the pre-installed baseline/operational conditions. In cases where the tracking system excludes baseline conditions, the survey will establish the operational and environmental conditions from which baseline conditions differ from the standard savings assumptions will be adjusted. When baseline data is available in the tracking system, the baseline information from the tracking system will be adjusted to reflect the survey results in the calculation of net savings. The non-participant audit survey will also be structured to identify the level of comparable low-cost actions taken by non-participants to net out the effects of free-riders for the direct install component. The information from the surveys along with reviews of current evaluation literature will serve as the basis for adjusting assumed savings values over time. Rebated Boilers, Insulation, and Infiltration For a sample of the HVAC and building shell improvement projects on-site verification efforts will be used to confirm the installations and the use conditions. Energy savings will be estimated using either building modeling or billing analysis.
	The process evaluation will be conducted at the same time as the three studies noted above and will include interviews with program managers and service providers, reviews of program materials, including marketing and outreach materials and reports and process evaluation questions placed on the impact evaluation survey instruments. The process study will provide recommendations to improve the program.
Administrative Requirements	Ramp-up period would require .25-.5 FTE for planning and program design. Although requirements could be minimized by coordination with the electric multi-family program, if the program is implemented using a contractor, the steady-state staffing requirement is approximately .25 for verification and general management. This program requires relatively ongoing support from other corporate elements including marketing, administration and IT.

Estimated Participation

Measure	2009 Installations	2010 Installations	2011 Installations
90% Efficient Commercial Furnace	6	10	20
Faucet Aerators	430	860	1300
Hot Water Pipe Insulation	260	510	770
Infiltration = 0.35 ACH	160	320	480
MF Efficient Boiler	1	3	4
Programmable Thermostat	320	640	960
R-11 Wall Insulation	7	10	20

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total	$226,000	$453,000	$679,000	$1,360,000

Savings Targets

The estimated program savings are based on building energy simulation of a single multifamily building prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a building and the building's location. The per-unit savings are not additive, but are based on simulations that assume only one specific measure is implemented. The individual measure savings associated with implementation of a bundle of these measures would be substantially lower.

Measure	Units	therms/unit
90% Efficient Commercial Furnace	1 building	1600
Faucet Aerators	apartment	3
Hot Water Pipe Insulation	apartment	30
Infiltration = 0.35 ACH	apartment	90
MF Efficient Boiler	1 building	660
Programmable Thermostat	apartment	4
R-11 Wall Insulation	1 building	3600

Total Savings:

Savings				
Year	2009	2010	2011	Total
Gross Therms	59,500	119,000	179,000	358,000
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	47,600	95,200	143,000	286,000

Program Metrics	The primary metrics are the energy savings. Annual deficits of greater than 10% should trigger program review and redesign. Secondary metrics pertain to the verification rate of direct install measures. If installation rates fall below 90%, program redesign may be warranted.
Cost-effectiveness	Total Resource Cost Test: 1.21

PROGRAM	Residential New HVAC
Objective	Promote purchase of new gas furnaces at efficiency levels above current federal standards. Promote proper sizing and installation of new residential gas furnaces and capture the associated savings. Transform current HVAC installation practices. This gas program will run synchronously with the electric Residential New HVAC program.
Target Market	Homeowners and dealers/installers of residential gas furnaces.
Program Duration	January 2009 – December 2011.
Program Description	There are substantial energy efficiency reduction opportunities associated with the installation of premium efficiency equipment, as well as its proper sizing and installation. Proper sizing of the units typically is accomplished using Manual J, the residential central AC sizing protocol developed by the Air Conditioning Contractors of America (ACCA) that uses detailed heat load calculations. This manual also applies for furnaces. Even when HVAC contractors use Manual J they can improperly apply the protocol. Quality installation of gas furnace units also requires system calibration, and may include duct sealing to further improve operating efficiency. Quality HVAC installations will be delivered through a network of HVAC contractors operating in the Ameren Illinois Utilities' (the Company) service territory that have been trained in program protocols and participation processes. The New HVAC Program will promote efficiency for new residential gas furnaces through the following program components: • Quality installation: HVAC contractors will be trained to meet a quality installation protocol that requires the proper use of Manual J for equipment sizing, as well as proper calibration. Contractor incentives will be provided for documented quality installations that meet the protocol. Information about duct sealing will also be provided to contractors but will not be a required component of the installation protocol. • Premium efficiency equipment: The program will also offer a standard incentive for all equipment that exceeds 90% AFUE. By promoting proper sizing and quality installation practices, the program will build capacity among HVAC contractors to address these issues and provide a value-added service to their customers. Program marketing efforts will promote the value of these services to customers and the energy-saving benefits. Incentives will be paid to the furnace contractor on a per job basis. The contractor has the option of passing the incentive through to the consumer in the form of a lower fee for the service/equipment, or retaining the incentive, depending on their marketing strategy. A coordinated recruitment and training strategy will be used to inform contractors of opportunities and incentives available through the Residential New HVAC Program.

Implementation Strategy	The Company will retain an implementation contractor responsible for recruiting, incentive fulfillment, and training. The key steps in the implementation process include: • Contractor recruitment and training: The implementation contractor will recruit HVAC contractors and arrange for them to participate in the required training that will address proper sizing and quality installation protocols. Contractor recruitment and training will be coordinated with the Company's Residential HVAC Diagnostics & Tune-up program and the Residential New HVAC program as outlined in the electric EEDR plan, so that contractors and their customers perceive the two programs as a single offering covering new and existing equipment. • Customer recruitment: The primary customer recruitment mechanism will be the direct marketing activities of participating HVAC contractors. Contractor recruiting of customers will occur during tune-ups and when systems are being replaced. As noted below, the program will use a number of marketing channels to build customer awareness. Program information will also be posted on the Company's web site. • Project implementation: Participating HVAC contractors will ensure proper equipment sizing and provide quality installation services according to program protocols. • Incentive application: HVAC contractors will submit incentive applications for qualifying services performed, as well as for any premium efficiency equipment installed. The Company's implementation contractor will perform a QA/QC review of all applications to ensure that required information and documentation has been provided. • Incentive payment: HVAC contractors will receive a per-job incentive for approved applications. • Project verification: The Company will reserve the right to site-verify work conducted by participating HVAC contractors prior to approval and payment of incentives.
Exit Strategy	This program is intended ultimately to transform the practices of HVAC contractors in both new equipment sales and installation practices. Because stocking decisions are made months in advance, withdrawal from the market should provide substantial notice to contractors.
Marketing Strategy	The Residential New HVAC Program is aimed at the mass market and as such will require a higher level of marketing activity to capture consumers' attention and generate sufficient project flow. Key elements of the marketing strategy will include: • Direct consumer marketing: To increase consumer awareness about the value of proper sizing, quality HVAC installations, and premium efficiency equipment, the Company will market the program through bill stuffers and other direct mail approaches. Customers will be directed to the website as the primary source of information. • Mass market advertising: During special promotions the Company will deploy mass market advertising (radio/newspaper/television) to promote services provided through the program. • Cooperative advertising: The Company will develop co-branded advertising templates (brochures, customer postcards, etc.) for participating HVAC contractors to use in their marketing efforts.

Eligible Measures and Incentive Strategy

The Company will reserve the right to revise eligible measures as needed in accordance with current market conditions, technology development, EM&V results, and program implementation experience.

Incentives will be paid to participating HVAC contractors on a per job basis for both the new HVAC systems and quality installations. Contractors will have the option of passing the incentive through to the consumer in the form of a lower product price or fee for the service, or retaining the incentive. This structure provides an added incentive to contractors to develop compelling sales strategies.

As the Residential New HVAC Program evolves beyond the initial ramp-up period and ongoing EM&V activities track program performance the Company may adjust incentive levels based on implementation experience.

Measure	Incentive per Unit
90% Efficient Furnace	$130
96% Efficient Furnace	$190

Note that these incentive levels are in most cases approximations based on the per measure incentives calculated within the cost-effectiveness model. The incentive budget shown below is drawn from the model's more detailed measure level calculations. Therefore, multiplying the per unit incentives shown here by estimated participation will not equal the program element's incentive budget.

Milestones

This program will likely attract the largest participation in the fall, prior to the heating season. The following schedule assumes that the program is ready to begin in the first quarter of 2009.

September 2008: Execute implementation contract

October 2008: Final program design and protocol development

November 2008: Soft-launch - contractor recruitment/training

January 2009: Full program launch

EM&V Requirements

The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses evaluation resources on the programs with the most savings and the highest risk of inaccurate ex ante estimates. This program focuses on creating and meeting the demand for higher efficiency furnaces and for properly sized unit installs.

For participants (trade allies and customers) who install more energy efficient equipment, interviews and tracking system reviews will be conducted to determine the Annual Fuel Utilization Efficiency (AFUE) that would have been installed without the program and the AFUE that was installed as a result of the program to get at the net AFUE unit installs that are caused by the program and the AFUE rating differences. This data will then be modeled to reflect the typical difference between the pre and post program net changes in unit decisions, practices and energy consumption. If added funding is available participating households will be surveyed to obtain use information that will be used to calibrate the models.

The process evaluation will be conducted at the same time as the impact study. This will involve reviews of the program materials, interviews with program managers and interviews with participating and non-participating trade allies and end-use customers. The process evaluations will focus on identifying experiences, satisfaction and the development of recommended changes to the program.

Administrative Requirements

If the Company chooses to contract for implementation, administrative requirements for this program are expected to be quite low. The start-up and ongoing FTE requirement would be subsumed under that for the Company's Residential HVAC Diagnostics & Tune-up program and the Residential New HVAC program as outlined in the electric EEDR plan. The costs would be allocated to the respective gas and electric programs. Limited participation from the Company's marketing organization would be needed, and no direct involvement from account management would be required.

Estimated Participation

Note the estimated participation figures shown below are rounded estimates calculated as function of an assumed participation rate.

Measure	2009 Installations	2010 Installations	2011 Installations
90% Efficient Furnace	500	1000	1500
96% Efficient Furnace	1500	3000	4500

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total	$538,000	$1,080,000	$1,620,000	$3,240,000

Savings Targets

The estimated program savings are based on building energy simulation of a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location.

Measure	Units	Therms/unit
90% Efficient Furnace	Home	170
96% Efficient Furnace	Home	230

Total Savings:

Savings				
Year	2009	2010	2011	Total
Gross Therms	436,000	874,000	1,310,000	2,620,000
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	349,000	699,000	1,050,000	2,100,000

Program Metrics

The primary program metrics are estimated energy savings. A key secondary metric is the number of contractors trained in the use of Manual J. At this point we do not have data on the size of the HVAC contractor market in the Company's service territory. However, the final implementation plan should set metrics based on better information regarding market size.

Cost-effectiveness

Total Resource Cost Test: 2.39

PROGRAM	Residential Low Income
Objective	To offer comprehensive retrofit packages for low income customers as a way of significantly reducing household energy costs.
Target Market	Owner-occupied 1-2 unit homes heated with natural gas that are eligible for participation as low income customers. Income eligibility guidelines will be set to match current weatherization assistance program levels.
Program Duration	Initial program implementation period is three years, commencing in January, 2009 and ending in December, 2011.
Program Description	The program will involve a comprehensive home energy audit and set of equipment and shell upgrades based on the audit. Furnace replacements will be provided in a limited number of cases. The program will be delivered by a third party contractor; ideally one already involved in the delivery of home weatherization services in Central and Southern Illinois.
Implementation Strategy	The Company likely will use third party services to help support the program, although internal resources are also likely to be used in implementation. The key to successful implementation is to integrate this into an existing delivery structure to minimize recruiting and implementation costs. Key steps likely include: o Selection of third party support contractor. o Development of final detailed program design, including intake forms, policies and procedures, training materials, marketing collateral and so forth. o Selection/development of appropriate home energy analysis software. The software must be capable of storing and downloading each analysis to enable tracking and verification. o Contractor recruitment. The implementation contractor will recruit insulation/weatherization contractors as program allies. Subject to attending a brief training session and execution of a participation agreement outlining program terms and conditions, including pricing, the contractors will be included on the list of contractors to be used for customer projects. The contractors will be rotated through the projects to ensure fair access. o Customer recruitment. Ideally, the program will be able to leverage existing agencies' weatherization assistance application lists. o Home energy audit. The implementation contractor or subcontractors will provide energy assessments for interested customers, with the audit cost subsidized by the program. During the audit, the contractor will install faucet aerators, low flow showerheads, and hot water pipe insulation. The audit will be designed to estimate potential energy savings due to infiltration and heat loss through walls and attics. In addition, if a gas furnace is present, the assessment will include identification of the age and size of the unit and the last service date. Ideally the audit software enables an onsite report (likely depends on the availability of utility bills). The report will be presented to the customer with recommendations for upgrades, and information about available rebates. o Upgrades. Based on the audit findings, the implementation contractor will arrange for the appropriate contractor to contact the customer for installation. o Verification. The first 5-10 projects performed by each contractor will be site-verified, with random verification thereafter.
Exit Strategy	This is a potentially complex program carrying the associated higher performance risk. It also is a program that can take a longer period to ramp-up to steady-state production. The program will identify a target number of homes per year to pursue and, to avoid disruption of local agency weatherization plans, the program should not be withdrawn in the course of a program year.
Marketing Strategy	The marketing strategy will depend on the implementation approach and contractor ultimately selected. This program most likely will not involve broad marketing but will rely on referrals from social service agencies and churches.

Eligible Measures and Incentive Strategy

The program will use a broad portfolio of measures, with the specific measures installed in any given home being a function of the audit results. The program analysis is based on the following measures and incentive levels. The incentives assume that the program pays the full cost of installing the measures.

Measure	Incentive per Unit
Low Income - No Furnace	$4,000
Low Income - With Furnace	$6,000

Milestones

September 2008: –Issue RFP for implementation services

November 2008: – Execute implementation contract

January 2009: – Complete detailed implementation plan

February 2009: – Program launch

EM&V Requirements

The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses evaluation resources on the programs with the most savings and the highest risk of inaccurate ex ante estimates. This program focuses on installing low-cost no-cost measures and identifying higher cost measures as recommended by an on-site energy audit.

The evaluation effort will employ two separate but coordinated strategies associated with the level of services received. For the low-cost no-cost direct install services that cannot be picked up in a billing analysis, the evaluation will review the program tracking system and the audit reports to identify installed technologies and environmental conditions associated with energy consumption (water temperature, showers or baths per day, energy-related demographic profiles. etc.). Then the study will use participant interviews to confirm the installation and continued use of the installed measures. As a low income program, the assumed net-to-gross ratio is 1.0, and no additional net-to-gross analysis is planned.

For the more comprehensive measures and higher impact measures the evaluation will use base-load and weather sensitive billing analysis approaches to identify savings achieved. The analysis will employ the use of a comparison group consisting of new enrollees into the program for the comparison group pre and post-participation period, with the post-program condition being the period after major measures are installed for all participants. The installation and confirmation of the measures will also be confirmed via interviews with the participants. During these interviews environmental and use conditions will be obtained for use in adjusting the results of the billing analysis.

The interviews with the participants will also include process evaluation questions on the program and the services provided. In addition the process evaluation will interview program managers and implementation contactors to assess the delivery approach and operations.

Administrative Requirements

As a third party turn-key program, the Company will incur relatively low administrative costs apart from participation in program final design and in ongoing verification and quality control. However, selection of the implementation contractor is critical. Similar programs have incurred high management costs in situations in which the implementation contractor failed to deliver.

Estimated Participation

The total number of homes served is about 30, 40 and 50 in 2009, 2010 and 2011 respectively. We assume that furnaces are replaced in 10% of homes.

Measure	2009 Installations	2010 Installations	2011 Installations
Low Income - No Furnace	30	40	50
Low Income - With Furnace	3	4	5

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total*	$241,000	$301,000	$392,000	$934,000

*Includes contractor training and audit costs.

Savings Targets

The estimated program savings are based on building energy simulation of a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location. The savings associated with the two measures listed are based on simulation of a bundle of insulation and weatherization measures being implemented simultaneously in a home. Therefore, interactive effects are accounted for.

Measure	Units	therms/unit
Low Income - No Furnace	Home	520
Low Income - With Furnace	Home	620

Total Savings Targets:

Savings				
Year	2009	2010	2011	Total
Gross Therms	19,200	24,000	31,300	74,500
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	1.00	1.00	1.00	
Net Therms	19,200	24,000	31,300	74,500

Program Metrics

Energy savings goals are the primary metrics. The key secondary metrics are the number of audits performed, the number of rebates paid and the cost per therm acquired. The number of audits sets the maximum pipeline flow and the number of rebates paid compared to audits determines the close rate which is key in predicting how the program will perform. Once final budgets and targets are set, baseline metrics can be calculated and deviations of more than 20% per quarter or 10% per year indicate that a formal review of program design/implementation is needed.

Cost-effectiveness

Total Resource Cost Test: 0.94

PROGRAM	ENERGY STAR New Homes
Objective	To increase consumer awareness of and demand for ENERGY STAR new homes while increasing the building industry's willingness and ability to construct ENERGY STAR homes. To achieve energy savings through sales of ENERGY STAR homes.
Target Market	New homes market, with initial focus on mid-market homes.
Program Duration	Initial program implementation period: 2009-2011.
Program Description	The program would target builders with a package of training, technical and marketing assistance and incentives for construction of ENERGY STAR new homes (homes with a HERS Index of 85 or lower). The incentive would be designed to defray the cost of the required home energy rating. In addition, the program would provide cooperative marketing support for builders.
Implementation Strategy	Several program designs have been implemented in ENERGY STAR new homes programs across the country. Early programs provided significant incentives to builders to defray the incremental costs of reaching ENERGY STAR levels. More successful programs have focused on providing marketing support and incentives that cover the cost of the HERS ratings required to establish that the home meets ENERGY STAR standards. Most ENERGY STAR new homes programs are implemented by contractors under the administration of the utility. The Company should offer potential implementation contractors the option to propose alternative program structures subject to savings targets set by the Company. The following design and implementation elements those employed by the most successful programs: o Build the HERS provider infrastructure. The key to all successful ENERGY STAR new homes programs is an active HERS rating provider community. RESNET – the organization that certifies HERS raters – shows there are close to twenty certified raters in Illinois (many of which are in the Chicago area), suggesting that there is at least a core of the required infrastructure already in place. o Recruit builders. This step requires one-on-one meetings with builders to establish the Program's value-proposition. That proposition in many markets has been that by building to ENERGY STAR levels builders can create market differentiation. Using large incentives as the value proposition can be inconsistent with a goal of transforming builder practices. Almost twenty builders in the downstate area are listed as ENERGY STAR builders, although they report only 13 labeled homes having actually been built in the last year. These builders have, however, built over 100 ENERGY STAR new homes in total. Outreach to and engagement of these builders will be essential part of the early recruiting strategy. o Provide builder training on ENERGY STAR requirements, compliance paths, incentive structures and the marketing strategy. o Recruit trade allies. HVAC contractors are key to the success of the program, as their ability to perform greatly influences the success of the program. These contractors will likely need training in proper sizing, charging and duct sealing. o Establish incentive structure. Several successful program models have been based on using a competitive bid process to award program incentives. The bid involves both a commitment to a number of homes as well as a bid of cooperative advertising dollars. o Establish builder production milestones; reallocate home incentives away from those builders that do not meet production commitments. o Depending on the strength of the local housing market and the extent to which realtors are involved in new home sales, the program also will offer lender, realtor and appraiser training courses.

Exit Strategy	This program is intended as a market transformation program and should have a limited duration. Premature withdrawal from the market (i.e. before ENERGY STAR new homes have achieved a majority market share) will slow the transformation process, and will impact the development of the HERS infrastructure, leading to a "stranded investment" in rating infrastructure. An exit from the market should be gradual and announced at least one building cycle in advance to allow builders to adjust their plans to the extent that these plans are based on the program. Note that program designs focused on providing rating and marketing support will have less adverse effect when they are withdrawn than those providing large construction incentives, as the builders in the former case are making design and build decisions based on the competitive advantage that ENERGY STAR provides rather than on the expectation of incentives.
Marketing Strategy	ENERGY STAR New Homes programs must incorporate two types of marketing strategies; one aimed at reaching and recruiting builders, and a supplemental marketing strategy, ideally designed and implemented jointly with builders, to raise consumer awareness of the advantages of the homes. Builder recruitment typically is one-on-one and through local builders' group meetings. Given that many national builders have adopted ENERGY STAR as their standard in at least some markets, this recruiting process uses the experience of these other offices to recruit offices in the Company's territory. The consumer marketing strategy typically involves a cooperative print, radio and sometimes television campaign to raise awareness of the availability of ENERGY STAR new homes. In addition, some coop funds may be used to support builder-specific advertising. Outreach to lenders, realtors and appraisers will be included in the strategy.
Eligible Measures and Incentive Strategy	Builders could pursue either a prescriptive or builder option package track. Measure: ENERGY STAR New Home — Incentive per Unit: $480
Milestones	September 2008: – Issue RFP for implementation services November 2008: – Execute implementation contract January 2009: – Complete detailed implementation plan February 2009: – Program soft launch – recruiting of contractors; initial marketing March 2009: – Full launch
EM&V Requirements	Savings would be determined based on home energy ratings. Given the prevalence of ENERGY STAR homes programs, relatively little ex post savings evaluation is needed beyond verification of ratings based on a small sample of homes.
Administrative Requirements	Typically, implementation is bid to a third party, with the Company responsible for general management and QA/QC. Program start-up will require up to .5 FTE, and the steady state requirement for a program of this size is .25 - .5 FTE. Fairly active involvement will be required of the Company's marketing/communications group in the design/approval of the marketing strategies.

Estimated Participation

Participation depends to a great extent on the nature of the housing market, and housing starts in virtually every market are down significantly. At the same time, ENERGY STAR labeled homes have shown themselves to help builders differentiate their product in a down market. The Company will closely monitor participation and housing starts and may reallocate funds from this program to others if program potential is restricted by the housing market in early years.

Measure	2009 Installations	2010 Installations	2011 Installations
New Homes	130	150	170

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total	$96,400	$112,000	$129,000	$337,000

Savings Targets

Measure	Units	therms/unit
ENERGY STAR New Home	Home	130

Total Savings Targets:

Savings				
Year	2009	2010	2011	Total
Gross Therms	16,600	19,400	22,300	58,300
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	13,300	15,500	17,800	46,600

Program Metrics

The primary metrics are the energy and demand savings. Key secondary metrics are the number of homes committed by builders and the number of HERS raters recruited.

Cost-effectiveness

Total Resource Cost Test: 1.24

4.2.3. Business Energy Efficiency Solutions

Like the Residential Energy Efficiency Solutions program the Ameren Illinois Utilities' Business Energy Efficiency Solutions Program offers a complementary set of energy management options to small business customers on gas tariff Rate GDS-2. The program will have two primary elements: a targeted food service element and a heating system improvement offering. This second program will include an outreach and recruiting focus on not-for-profit organizations and churches on gas tariff Rate GDS-2.

PROGRAM	Small Business Food Service
Objective	Offer gas savings incentives for the installation of energy efficiency measures for food service establishments, motivating these customers to select high efficiency equipment when making purchasing decisions. The Small Business Food Service element targets an important small Business gas consuming market with large savings potential.
Target Market	This program is designed for food service customers on Rate GDS-2 seeking to improve the efficiency of their kitchen operations. All targeted customers taking delivery service from Ameren Illinois Utilities on Rate GDS-2 are eligible for this program.
Program Duration	January 2009 through December 2011.
Program Description	This program operates in two distinct paths. First, a contractor will directly install efficient spray valves in kitchens throughout the territory. Second, the contractor will offer ENERGY STAR gas griddle and gas fryer incentives. The principal objective of the Small Business Food Service element is to provide an expedited, simple solution for food service customers interested in purchasing efficient technologies that can produce verifiable savings. The program can be ramped up quickly, and primarily targets these discrete upgrade opportunities. Streamlined incentive application and verification and quality control processes will be employed to facilitate ease of participation and minimize the time required for incentive payment. Note that where additional opportunities exist for replacement of heating system, the customer will also be offered these incentives. Relationships with trade allies (equipment vendors and installation contractors) will be a key strategy for promoting the prescriptive incentive availability to customers. If needed to boost participation, trade ally incentives may also be used for limited-time promotions.

Implementation Strategy	Implementation contractor(s) selected through an RFP process will administer the program element. Spray valves will be directly installed by the contractor. Further efficiency measure implementation and installation will be the responsibility of the customer. Key elements of the Small Business Food Service element implementation strategy include: • Direct Installation of Spray Valves: The implementation contractor will directly install efficient spray valves for food service customers on Rate GDS-2 throughout the territory. • Trade ally recruitment and training: Trade allies will be a key delivery mechanism for the program element as they promote participation and available incentives to their customers. Trade allies will be recruited to participate in training sessions to inform them about program incentives, participation processes, and requirements. Trade allies will receive regular communications about program activities and changes to ensure they are informed and engaged participants. • Customer recruitment: Primary responsibility for recruiting will rest with the implementation contractor, supported by program marketing and outreach activities and trade ally outreach. • Technical assistance: The program implementation contractor will provide guidance regarding program offerings and participation processes to customers and trade allies as needed to minimize confusion and barriers to participation. • Application submittal: Customers will submit incentive applications and required documentation after installation of qualifying energy efficiency measures has been completed. • QA/QC review: Incentive applications will be subject to a QA/QC review to ensure all required forms and documentation have been submitted, and that calculation of incentive totals are correct. • Project verification: The Company will reserve the right to site-verify installations prior to approval and incentive payment. • Incentive payment: To minimize barriers to participation, the Program will seek to expedite incentive payment.
Marketing Strategy	The Small Business Food Service Program element will be marketed to restaurants. The Business Customer Service Center will be a source of information. • Customer marketing: marketing efforts will include general advertising, direct mail and other targeted marketing methods, training presentations, participation in trade shows and trade association events. Direct mail and targeted marketing will be achieved by providing the implementation contractor with customer list. • Trade ally marketing: Outreach and training will be provided for trade allies, industry professionals and energy services companies that have business motivations for promoting the incentives to their customers. • Cooperative marketing: The Company will seek to leverage trade ally advertising by pursuing cooperative marketing opportunities. • Web: A clear web presence for the program will be established across all program elements.
Exit Strategy	This is largely a direct installation program that can easily be pulled from the market at any time without an adverse market impact. The program will exit when tracking and EM&V suggest that 80-90% of eligible customers have been reached.

Eligible Measures & Incentive Strategy

The Small Business Food Service program element will provide standard per-measure incentives that offset the incremental cost of energy-efficient equipment. As the program element evolves beyond the initial ramp-up period and ongoing EM&V activities track program performance, the Company may adjust incentive levels based on implementation experience.

Incentives

Measure	Incentive per Unit
Energy Efficient pre-rinse spray valve	$70
High Efficiency Gas Fryer	$650
High Efficiency Gas Griddle	$530

The Company reserves the right to revise eligible measures as needed in accordance with current market conditions, technology development, EM&V results, and program implementation experience.

Milestones

September 2008: – Issue RFP for implementation services

November 2008: – Execute implementation contract

January 2009: – Complete detailed implementation plan

February 2009: – Program launch

EM&V Requirements

The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses the evaluation resources on the programs with the most savings and highest risk of being inaccurate. This program element has less risk of eroded savings estimates (compared to other programs in the portfolio) because of the technologies included and the target market. Verification of measure installation will be made for a statistically significant sample of projects.

The evaluation approach for this program element will employ a sampling strategy that focuses the evaluation sample to reflect the types of projects recorded in the tracking system. The primary evaluation approach will employ on and off-site verification assessments to confirm the projects are installed and used under conditions that provide the expected savings. Because these are typically well understood projects in which the as-installed-and-used conditions drive the savings analysis, it is expected that few if any International Performance Measurement and Verification Protocol (IPMVP) metering or monitoring assessments will be conducted. However, in some instances for which ex ante savings estimates may be determined to be unreliable because of specific participant conditions, focused but limited metering or monitoring or billing analysis approaches may be conducted. The evaluation contractor will also assess assumed baseline conditions via interviews with participants and the findings from the on and off-site verification efforts. Interviews with participants will also be conducted to establish the program element's NTG ratios.

Administrative Requirements

The Company will be responsible for developing the implementation contractor RFP, implementation contractor selection, approving final program design and marketing strategy, and monitoring contractor and goal performance.

Implementation contractor responsibilities include working with the Company on final program design, marketing materials development, program marketing and outreach activities, project management and QA/QC activities, customer and contractor dispute resolution, tracking and reporting, and program goal achievement.

Estimated Participation

The following participation estimates have been used for planning purposes. However, The Company reserves the right to adjust anticipated participation levels as necessary in accordance with current market conditions, EM&V results, and program implementation experience.

Measure	2009 Installations	2010 Installations	2011 Installations
Energy Efficient pre-rinse spray valve	1500	3000	4900
High Efficiency Gas Fryer	10	30	40
High Efficiency Gas Griddle	10	30	40

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total	$177,000	$354,000	$575,000	$1,110,000

Savings Targets

Measure	Units	therm/unit
Energy Efficient pre-rinse spray valve	1 unit	290
High Efficiency Gas Fryer	Fryer	440
High Efficiency Gas Griddle	Griddle	220

Total Savings:

Savings				
Year	2009	2010	2011	Total
Gross Therms	449,000	898,000	1,460,000	2,810,000
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	359,000	718,000	1,170,000	2,250,000

Program Metrics

Energy savings goals are the primary metrics. The key secondary metrics are the number of rebates paid and the cost per therm acquired. Once final budgets and targets are set, baseline metrics can be calculated and deviations of more than 20% per quarter or 10% per year indicate that a formal review of program design/implementation is needed.

Cost-effectiveness

Total Resource Cost Test: 6.89

PROGRAM	Small Business Tune-Up
Objective	Promote purchase of new heating systems and controls as well as proper sizing of such systems.
Target Market	Small business owners (Rate GDS-2)
Program Duration	January 2009 – December 2011.
Program Description	The majority of gas use in small Business facilities outside of the food service business is for space heating. This program will offer incentives for replacement of boilers and furnaces in small Business facilities, as well as improvement of the operation of existing systems through installation of proper controls and equipment tune-ups. The program will rely heavily on the trade allies currently providing HVAC/plumbing services to the businesses since they typically are most influential in service and purchasing decisions. The program will offer standard incentives for heating system upgrades as well as for basic tune-up services. By promoting proper sizing and quality installation practices, the program will build capacity among HVAC and boiler contractors to address these issues and provide a value-added service to their customers. Program marketing efforts will promote the value of these services to customers and the energy-saving benefits. Incentives will be paid to the contractor on a per job basis. The contractor has the option of passing the incentive through to the consumer in the form of a lower fee for the service/equipment, or retaining the incentive, depending on their marketing strategy.

Implementation Strategy	The value of this program depends critically on current practice within the Company's territory. Therefore, as an element of this offering the Company will begin collecting information on the relative prevalence of different heating types with the Rates GDS-2 tariff schedule. The program has been assessed under the assumption that a substantial number of small retail establishments use hot water or steam heat. However, the program is structured to be technology neutral to support replacement of either boilers or forced air furnaces. The Company will retain an implementation contractor responsible for recruiting, incentive fulfillment, and training. The key steps in the implementation process include: • Contractor recruitment and training: The implementation contractor will recruit HVAC and plumbing contractors and arrange for them to participate in the required training that will address proper sizing and quality installation protocols. • Customer recruitment: The primary customer recruitment mechanism will be the direct marketing activities of participating HVAC and boiler contractors. Program information will also be posted on the Company's web site. • Project implementation: Participating HVAC and boiler contractors will ensure proper equipment sizing and provide quality installation services according to program protocols. All projects involving installation of new heating systems will require an incentive reservation that includes all pertinent information regarding the existing and proposed replacement systems. The program implementation contractor will review the information to confirm eligibility. • Incentive application: Contractors will submit incentive applications for qualifying services performed, as well as for any premium efficiency equipment installed. The Company's implementation contractor will perform a QA/QC review of all applications to ensure that required information and documentation has been provided. • Incentive payment: HVAC and boiler contractors will receive a per-job incentive for approved applications. • Project verification: The Company will site-verify work conducted by participating contractors prior to approval and payment of incentives.
Exit Strategy	The program will not significantly impact stocking practices or vendor-customer relationships. As such, exit from this program can occur quickly if it proves to be ineffective.
Marketing Strategy	Program marketing for this customer segment is likely to work best as a combination of relationship marketing by the customers' existing heating system allies, and outreach to the small business community through targeted mailings, and contract with local small business associations. The key attribute of customers in this segment is their limited ability to investigate efficiency options given other demands on their limited resources. Marketing is most effective when delivered as part of routine sales and service calls, and as part of normal Ameren Illinois Utilities contact with small businesses. As part of its work with trade allies, the Company will provide support for cooperative advertising such as co-branded advertising templates (brochures, customer postcards, etc.) for participating HVAC and boiler contractors to use in their marketing efforts.

Eligible Measures and Incentive Strategy

The Company will reserve the right to revise eligible measures as needed in accordance with current market conditions, technology development, EM&V results, and program implementation experience.

Incentives will be paid to participating HVAC and boiler contractors on a per job basis for both the new systems and quality installations, and for tune-up of existing systems. Contractors will have the option of passing the incentive through to the consumer in the form of a lower product price or fee for the service, or retaining the incentive. This structure provides an added incentive to contractors to develop compelling sales strategies.

As the Small Business Tune-up evolves beyond the initial ramp-up period and ongoing EM&V activities track program performance the Company may adjust incentive levels based on implementation experience.

Measure	Incentive per Unit
85% Efficient Commercial Furnace	$510
Efficient Boiler	$280

Note that these incentive levels are in most cases approximations based on the per measure incentives calculated within the cost-effectiveness model. The incentive budget shown below is drawn from the model's more detailed measure level calculations. Therefore, multiplying the per unit incentives shown here by estimated participation will not equal the program element's incentive budget.

Milestones

This program will likely attract the largest participation in the fall, prior to the heating season. The following schedule assumes that the program is ready to begin in January 2009.

September 2008: Issue RFP

November 2008: Final program design and protocol development

January 2009: Soft-launch - contractor recruitment/training

February 2009: Full launch

EM&V Requirements

The evaluation approach will be contingent on the evaluation resources available to the study and the results of an evaluation planning approach that focuses evaluation resources on the programs with the most savings and the highest risk of inaccurate ex ante estimates. This program focuses on creating and meeting the demand for properly sized and installed higher efficiency boilers, and the tune-up of existing boilers.

For installation of boiler controls the impact evaluation will employ a sampling approach to verify that the measures are installed. Billing analysis likely will be required to validate per measure savings estimates. Similarly, savings associated with installation of new heating systems will require both on-site verification of the installation and performance of the new system as well as detailed engineering or billing analysis to estimate savings. Because of the wide variety of conditions into which the new equipment will be installed, sampling is of limited value, and a high percentage of the sites likely will require site verifications and site-specific impact analyses.

The process evaluation will be conducted at the same time as the impact study. This will involve reviews of the program materials, interviews with program mangers and interviews with participating and non-participating trade allies and end-use customers. The process evaluations will focus on identifying experiences, satisfaction and the development of recommended changes to the program.

Administrative Requirements

The Company will be responsible for developing the implementation contractor RFP, implementation contractor selection, approving final program design and marketing strategy, and monitoring contractor and goal performance.

Implementation contractor responsibilities will include final program design and protocol development, marketing materials development, program marketing and outreach activities, management and oversight of the HVAC and plumbing contractor network, QA/QC activities, tracking and reporting, and program goal achievement.

Estimated Participation

Note the estimated participation figures shown below are rounded estimates calculated as a function of an assumed participation rate.

Measure	2009 Installations	2010 Installations	2011 Installations
85% Efficient Commercial Furnace	80	170	250
Efficient Boiler	20	30	50

Estimated Budget

Estimated Budget				
Budget Category	2009	2010	2011	Total
Total	$80,100	$160,000	$240,000	$480,000

Savings Targets

Measure	Units	Therms/unit
85% Efficient Commercial Furnace	1 building	390
Efficient Boiler	1 building	320

Total Savings:

Savings				
Year	2009	2010	2011	Total
Gross Therms	37,100	74,300	111,000	222,000
Realization Rate	1.00	1.00	1.00	
Net-to-Gross	0.80	0.80	0.80	
Net Therms	29,700	59,400	89,100	178,000

Program Metrics	The primary program metrics are estimated energy savings. Secondary metrics include number of new boilers installed and number of boiler tune-ups completed. At this point we do not have data on the size of the HVAC contractor market in the Company's service territory. However, the final implementation plan should set metrics based on better information regarding market size.
Cost-effectiveness	Total Resource Cost Test: 1.48

5. Evaluation, Measurement, and Verification (EM&V)

5.1. Overview

Evaluation involves real time and/or retrospective assessments of the performance and implementation of a program. There are at least three key objectives of evaluations for the Ameren Illinois Utilities natural gas energy efficiency portfolio:

1. Document and measure the effects of a program in order to determine how well it has met its efficiency goals with respect to being a reliable, clean and cost-effective energy resource,
2. Understand why those effects occurred and identify ways to improve current programs and select future programs.
3. Document compliance with load reduction targets

There are three different types of evaluations:

1. *Impact evaluations* determine the impacts (usually energy savings and perhaps avoided emissions for natural gas programs) and co-benefits (such as health benefits, job creation, and water savings) that directly result from a program. Impact evaluations often also include cost-effectiveness analyses that may include both energy and related, non-energy benefits.
2. *Process evaluations* assess program delivery, from design to implementation, in order to identify bottlenecks, efficiencies, what worked, what did not work, constraints, and potential improvements. Timeliness in identifying opportunities for improvement is key to making corrections along the way.
3. *Market effects evaluations* estimate a program's influence on encouraging future energy-efficiency projects because of changes in the energy marketplace. These evaluations are primarily used for market transformation programs.

5.2. Selecting a Master Evaluation Contractor

The credibility of program energy savings is based on the verification of reported energy savings by an independent evaluator. The process should rely on the use of an evaluation contractor without financial interest or the appearance of any conflict of interest with the Company or any of its implementation contractors.

The Company's preference is to utilize a single master EM&V contractor to evaluate both the Company's natural gas and electric energy efficiency portfolios. This preference is aligned with the Company's intent to integrate both its natural gas and electric energy efficiency programs in a seamless manner for customers.

5.3. Establish Appropriate Program M&V Protocols and Guidelines

During the program design phase and prior to program launch, the Company will work with the evaluation contractor to establish appropriate M&V protocols specific to each program. All M&V protocols should be developed in accordance to the International Performance Measurement and Verification Protocol (IPMVP), and should take advantage of the development of other recent similar protocols. Where the gas program designs are aligned with electric energy efficiency programs, the EM&V protocols similarly should be coordinated to take advantage of economies of scale in data collection and to minimize the risk of multiple customer contacts. The M&V protocols should address the following:

- The type of evaluation required for each type of program based on IPMVP guidelines. The guidelines include four basic options:
    - Option A: Stipulated savings values
    - Option B: Short-term field measurement of savings
    - Option C: Detailed billing analysis
    - Option D: Calibrated simulation analysis
- The schedule for evaluation activities.
- The methods to be used in estimating and applying net-to-gross ratios.
- The contents and format of evaluation plans to be prepared by the evaluator.
- The contents and format of evaluation reports.
- The allocation of available evaluation funding across time and evaluation activities.

With respect to the specific evaluation approach for each program, the Company believes that stipulated savings values (Option A) should be utilized to the extent possible for hot water measures where savings are not likely to vary significantly as a function of outdoor temperature. It might also be possible to develop standardized savings values or calculations for simple infiltration measures. For most space-heating measures a more robust M&V method may be required. The level of M&V performed should correspond to the level of risk to the Company in assuring performance and persistence of savings.

5.4. Verification and Due Diligence of Project Savings

The Company will work with implementation contractors to develop and implement QA/QC, inspection and due diligence procedures for those programs for which stipulated energy savings are not appropriate. These procedures will vary by program and are necessary to assure customer eligibility, completion of installations, and the reasonableness and accuracy of savings upon which incentives are based. The evaluation contractor should have responsibility for installation verification and estimation of energy savings for purposes of independent evaluation.

The activities that the Company will undertake in performing M&V procedures may include, but are not limited to, the following:

- Review of custom rebate applications and project proposals for eligibility and completeness.

- Inspect and verify a statistically valid sample of installations for purposes of ensuring compliance with program requirements.
- Prepare and facilitate M&V plans where needed based on the project, and assure adherence to IPMVP protocols.
- Approve projects and incentive amounts for payment.

The Company will retain third party engineering expertise for project evaluation and M&V services as necessary.

5.5. Provide an Independent Evaluation of Program Impacts

Impact evaluations are designed to analyze and measure the impact of a program in terms of program participation, measure installation and achieved net demand and energy savings. The impact evaluation is focused on the quantitative measurement of the attainment of program goals, and the primary objective of an impact evaluation is usually the independent verification of program savings.

The evaluation contractor should determine program and portfolio impacts based on the evaluation protocols and individual program evaluation plans. The Company will implement a program tracking system that can support both ongoing program management and assessment and the independent evaluation. A critical requirement of an evaluation study is a detailed analysis and explanation of the factors accounting for the degree to which the original estimate of energy savings corresponds to the estimate produced by the study, termed the “program realization rate”. A realization rate often incorporates two elements; (1) verification of gross energy savings—the extent to which installation of a measure or completion of a project produces estimated energy savings, and (2) estimation of net impacts – subtracting from gross verified energy savings the energy savings realized by free riders.

To maximize the efficiency of the evaluation given limited evaluation funds, final program designs and implementation plans will include detailed recording, tracking and reporting protocols.

5.6. Provide Internal Quality Assurance and Control

In addition to the procedures outlined above for verifying energy savings from the Company’s proposed portfolio, we will implement appropriate internal controls to assure the quality of program design and implementation. The Company will establish a consistent and integrated tracking and reporting system for all programs in the portfolio. The Company will produce internal monthly reports on all customer interactions, including customers recruited, incentive applications, incentives processed, and installations verified, and will establish procedures for ongoing verification. The Company will require implementation contractors or staff to routinely contact/visit a sample of participating and non-participating customers to assess the quality of program delivery and the installation of measures for which incentives were claimed. The Company will track on an on-going basis, incentive fulfillment time, technical services delivery times (how long between customer request and audit completion for example), incentive documentation, and customer complaints among other metrics of program performance.

6. Implementation Planning

Implementation of the energy efficiency efforts outlined in this Plan requires continued planning at both the portfolio and program levels to further refine and expand the information presented. This section outlines the tasks and schedule for developing portfolio elements and introducing them to the market-place in an orderly, cost effective manner.

6.1. Portfolio Level

Implementation planning at the portfolio level involves an ongoing assessment of program mix and timing to assure that the portfolio remains aligned with objectives. Specific implementation activities associated with the portfolio as a whole include tracking system development and management, market assessment and market research, development and management of an overall marketing and communications strategy and design and management of a back office including processes for incentive fulfillment, procurement of implementation services, and integration with broader corporate services such as billing, accounting and web services.

6.1.1. Market Research and Analysis

This initial Plan is based on best-available information regarding the market into which the portfolio is to be introduced. However, lack of territory-specific data regarding energy efficiency measure saturations and housing and building stock limits the Company's ability to conduct effective portfolio and program planning over the longer term. In addition, while the programs included in the portfolio are based on current practice across the utility industry, the Company has not had the opportunity to test program design with customers through targeted market research. The Company may identify, plan and execute specific market assessment and market research projects over the next three years in an effort to improve its ability to design and target cost-effective efficiency and demand-response programs. These programs could include:

- An appliance saturation study.
- Market characterization studies of key markets such as residential and small business HVAC, residential existing homes and new construction.
- Customer satisfaction surveys and focus groups designed to elicit customer feedback on program design and delivery.
- Program process evaluations to assess program design and implementation processes.

6.1.2. Develop Portfolio Communications Plan

Each program in the portfolio will have a specific marketing, communication and recruiting strategy. However, at the portfolio level, a broad communications strategy will be developed that addresses program branding, program collateral standards, customer service standards for implementation contractors, use of Company's trademark by implementation contractors, call center and customer account representative training, web standards and integration with the Company's broader communications strategy. The gas energy efficiency communications plan will address opportunities to improve messaging and increase impact through joint communications with the electric energy efficiency plan.

6.1.3. Back-office Systems Development

Back-office systems for tracking, reporting and incentive fulfillment are a critical operational component of the energy efficiency portfolio. Accurate acquisition, storage and reporting of data

are essential for portfolio management and goal achievement. The system(s) must be capable of providing timely information to evaluate portfolio and program performance and support adjustments in program efforts and focus. The final design of the back-office systems must be consistent with portfolio administration and program implementation structures and current Company IT systems and resources. The Company expects that the system used to track the gas programs will be integrated into the system being developed for the electric energy efficiency plan.

Key system requirements include:

- Ability to log each customer participant/customer/location
- Ability to track each interaction with the participant
- Ability to match participant/customer information to account numbers and associated data on the Company's current systems, and ability to upload/download account information
- Ability to store and upload/download site and project information
- Ability to process and record incentive transactions
- Ability to send/receive to/from program web site

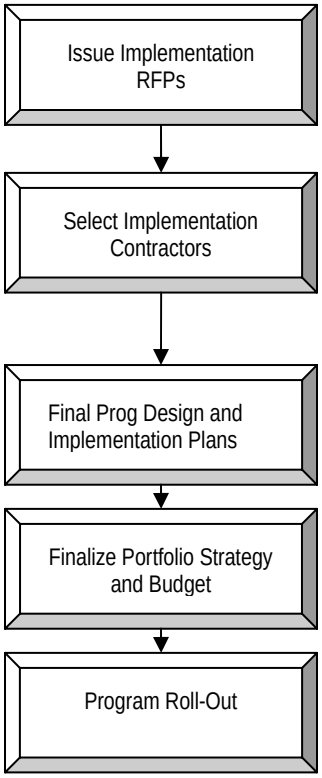
The Company currently is evaluating whether the required functionality is most efficiently and cost-effectively obtained through modifications to legacy systems or a third party system.

In addition to building a tracking system, processes must be developed for receiving, processing and paying program incentives. Typically, implementation contractors have responsibility for incentive payment with reimbursement by the Company. In the case of large projects, however, the Company may retain the incentive approval and payment responsibility. In either case, the processes must be uniform, documented and auditable. The Company does not intend to implement online incentive application and payment processes initially.

6.2. Program Level

The process for developing and implementing the energy efficiency programs in the portfolio will typically follow the process diagramed in Figure 4.

Figure 4: Program Development and Implementation Process



6.2.1. Select Implementation Contractors

The Company will rely extensively on third party contractors to implement the programs within its portfolio. These contractors may be selected via competitive bid through requests for proposals. The Company will select contractors based on best value offered.

We anticipate contracts for the following:

- Business Energy Efficiency Solutions. Bundled delivery of the two small business program elements. Effectively reaching what is otherwise a hard-to-reach market will require an approach that offers an easy to access one-stop-shop, combined with significant direct outreach to customers and direct installation of basic measures.
- Residential Energy Efficiency Solutions. All program initiatives aimed at the residence (aside from the low income program) would be managed through a single contract. As with the

Business Energy Efficiency Solutions approach, the Company believes that customer service and program effectiveness is maximized by integrating all residence-focused programs under a single implementation contract.

- Low income – The Low income program will involve a comprehensive home energy audit and set of equipment and shell upgrades based on the audit. Furnace replacements will be provided in a limited number of cases. The program will be delivered by a third party contractor, ideally one already involved in the delivery of home weatherization services in Central and Southern Illinois.

The Company will consider use of performance-based contracts that tie some fraction of contractor compensation to delivery of verified energy savings, or provide incentives for delivery of specified verified energy savings below budget. Use of performance-based contracts could enable the Company to manage some of its performance and evaluation risk, although the value to the Company and its customers of such contracts depends on their structure and the cost of the risk premium that the Company would need to pay.

6.2.2. Finalize Program Designs and Implementation Plans

The program templates presented above in Section 4 are intended to provide sufficient detail on program design, implementation and evaluation to support stakeholder and Commission review of the Company's portfolio. However, actual implementation must be based on much more detailed program designs and implementation plans. The Company envisions that these detailed plans will be developed by the entities selected to implement the programs, in close consultation with the Company. Should performance-based contracts be used for one or more program elements, the contractor should retain some latitude for program design to maximize the likelihood that it can meet performance targets.

Final program designs will describe the final proposed structure of the program, specific incentive levels or methods for calculating incentives, and marketing and recruiting strategies to ensure that targets are met. It is likely that as final designs are completed assumptions used to prepare this Plan will be revised. Specifically, final design is likely to refine the types and costs of measures to be included, the level of incentives and specific program costs based on the more detailed design. Therefore, the final step in program will be a recalculation of program element cost-effectiveness to ensure that the program continues to pass the TRC test. The implementation plans will provide detailed roadmaps for program roll-out and management, including customer qualification, rebate fulfillment, customer care, data capture and tracking, reporting, and quality control processes. The implementation plans also will include quarterly projections of installations and spending, as well as all proposed participation agreements and incentive forms.

6.2.3. Finalize Portfolio Strategy and Budget

At the same time that the Company is working with contractors to finalize the implementation plans for its resource acquisition programs, it will develop the structure for its market transformation initiatives and put in place the elements needed for program and portfolio management. Once final designs and implementation plans are complete, the portfolio budget will be rebalanced to ensure that it remains within the spending limit, and the portfolio TRC will be checked to ensure that the portfolio remains cost-effective.

6.3. Program Implementation Management

Direct program implementation will be the responsibility of the contractors retained through the procurements described above. The Company will assign a Residential and a Business program manager to oversee the contractors. These managers will have responsibility for ensuring effective implementation processes are in-place and followed and for regular reporting of program progress. Weekly, monthly, quarterly and annual reporting will be required. The Company will review the performance of all contractors and will add or subtract contractors on as needed basis.

6.4. Portfolio Implementation Schedules

A proposed schedule for the portfolio implementation process has been developed based on Commission approval of the Plan in the early fourth quarter of 2008. This schedule provides for completing program design and portfolio management structure development by early 2009, with launch of the programs in the first quarter of that year. A detailed implementation plan incorporating the steps described above will be prepared following Commission approval.

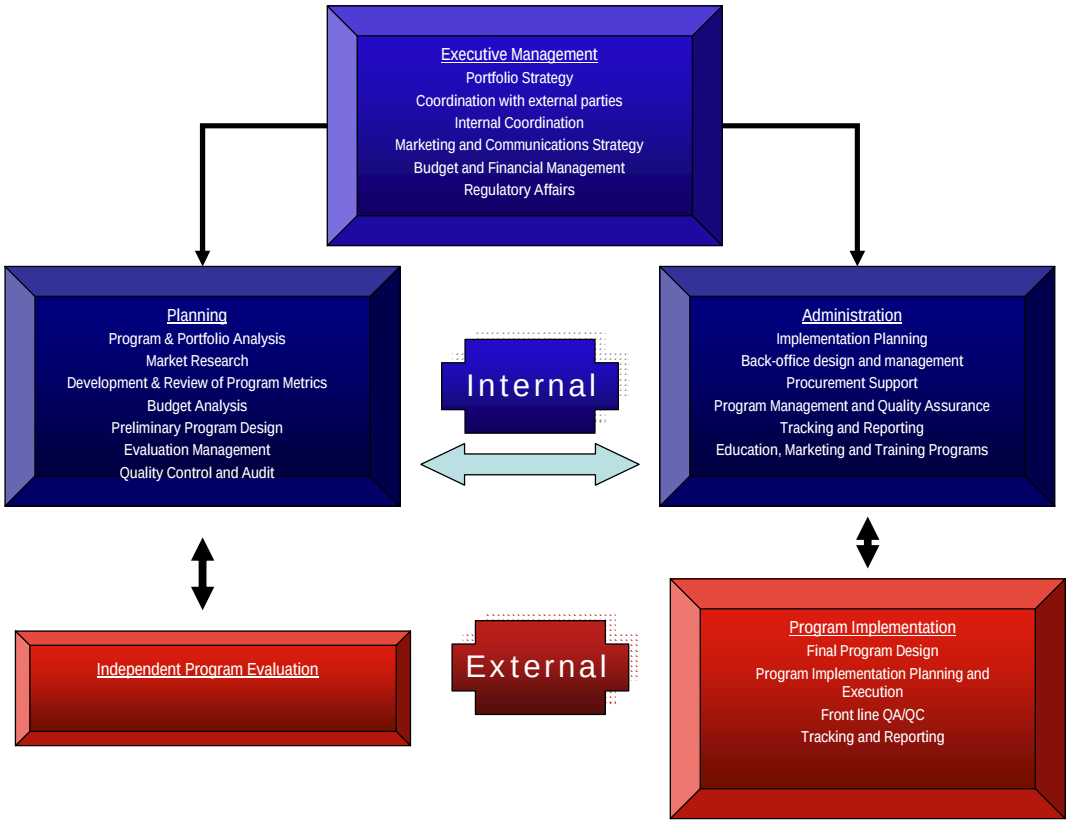
7. Portfolio Management

Successful implementation of the Plan relies on an effective and efficient process for managing several key functions at the level of both the individual programs and the portfolio level. This section outlines these functions, and the Company's proposed approach to managing them.

7.1. Management Functions

Implementation is built upon five functions, several of which are largely internal to the Company. The Company expects that management of the gas energy efficiency portfolio will be integrated with electric energy efficiency programs with appropriate cost tracking. Portfolio management functions are illustrated in Figure 5.

Figure 5: Portfolio Management Functions



7.1.1. Executive Management - Internal

This function sets, communicates, and ensures follow-through with the Company's' portfolio strategy, and includes the following activities:

- **Portfolio Strategy**: Develop and revise the strategy guiding the composition of the portfolio, including allocation of available resources across sectors and programs. The strategy will be reviewed and revised at least annually.
- **External Coordination**: Communicate the Company's' strategy and progress to the ICC and key external stakeholders.
- **Internal Coordination**: Identify internal systems and functions that contribute to or are affected by program implementation and management. Ensure all internal stakeholders are involved in developing the final implementation plan. Coordinate activity to ensure internal tracking and reporting systems are in-place and integrated as necessary. Ensure use of consistent messaging and provide general oversight of the planning and implementation.
- **Budgeting and Financial Management**: Set annual program and administrative budgets consistent with the portfolio strategy and available resources. Track costs against budgets.
- **QA/QC:** Manage overall portfolio quality assurance, reviewing reports from individual programs and monitoring quality of internal systems and Company-provided services.
- **Communications and Marketing Strategy:** Coordinate development of the overall portfolio messaging, and ensure that Company-developed standards are met by program implementers.

7.1.2. Policy and Planning—Internal

This function provides the analysis and ongoing market intelligence to support the Executive function. Key policy and planning activities include:

- **Program and Portfolio Analysis**: Energy savings and cost-effectiveness analyses of the programs comprising the portfolio and the portfolio as a whole. Subsequent to Commission approval of this Plan, the Company will direct development of detailed program designs and a re-analysis of portfolio costs and benefits based on any new information as it becomes available or as final designs change from initial proposals. The planning process will be ongoing and an integral element of the Company's' portfolio management.
- **Market Research**: This Plan was developed over a very short period of time with limited information regarding the market into which programs will be introduced (e.g. equipment saturations and market shares, the distribution of business building types, current building energy management practices, etc). Gathering such information, as well as building a better understanding of consumer energy efficiency behavior, is critical to the ongoing review and development of the portfolio.
- **Development and Review of Program Metrics**: Set and periodically adjust portfolio and individual program performance metrics related to savings acquisition, cost-effectiveness, quality control and customer service. Prior to formal program launch the Company will develop a portfolio management plan that prescribes performance, financial and customer service metrics for each program and outlines the process to be used to monitor performance against these metrics.

- **Budget Analysis**: Develop and review annual program implementation budgets relative to program metrics and performance. Prepare annual reconciliation filings.
- **Preliminary Program Design**: In most cases, detailed final program designs will be developed by the parties implementing the programs subject to Company review and approval. However, initial program concepts will be developed and analyzed by the Company for consistency with portfolio objectives, market needs and budgets.
- **Manage Evaluation:** Internal ongoing evaluation and verification activities will be developed. Third party EM&V services will be utilized and the Company will work with the contractor and stakeholders to develop specific EM&V protocols, including tracking and reporting requirements for each program. Third-party EM&V should commence early and be ongoing. The Program Management Policy and Planning function will be responsible for managing the evaluation work and incorporating results into ongoing program and portfolio reviews.

7.1.3. Program Administration—Internal

Also supporting the Executive function are a number of administrative activities that ensure development of and compliance with effective and efficient implementation guidelines. This function also involves critical coordination between internal and external systems. Major activities include:

- **Implementation Planning**: Managing development of plans and processes for implementing and integrating the overall portfolio management structure with individual programs. Develop implementation critical paths based on portfolio metrics and available resources.
- **Support Back Office System Design and Implementation**: Identify requirements for program customer relationship management, financial incentive fulfillment and tracking and reporting. Determine appropriateness of existing Company systems and define gaps. Identify required new systems/system enhancements and coordinate procurement/installation.
- **Procurement Support**: Many program services will be delivered by third party vendors or implementation contractors. RFPs/RFQs must be developed for specific competitive services. Contracts for delivery must be developed and include performance provisions to mitigate the Company's risk. Coordinate with internal corporate legal and procurement groups.
- **Management of Third-Party Vendors**: Day-to-day oversight of implementation contractors and service vendors to ensure delivery meets contractual standards. Identify program design and delivery issues.
- **Management of Program Tracking and Reporting**: Ensure third party implementers and vendors as well as internal staff consistently use the program's tracking system. Responsible for monthly system downloads and preparation of status reports including program performance and cost.
- **Internal EM&V**: Using the program tracking and reporting system, as well as on-site verification and customer surveys, the Company will conduct ongoing program evaluation as a check on overall program quality and an early-warning system to spot potential performance or customer service issues. This function also will manage third party

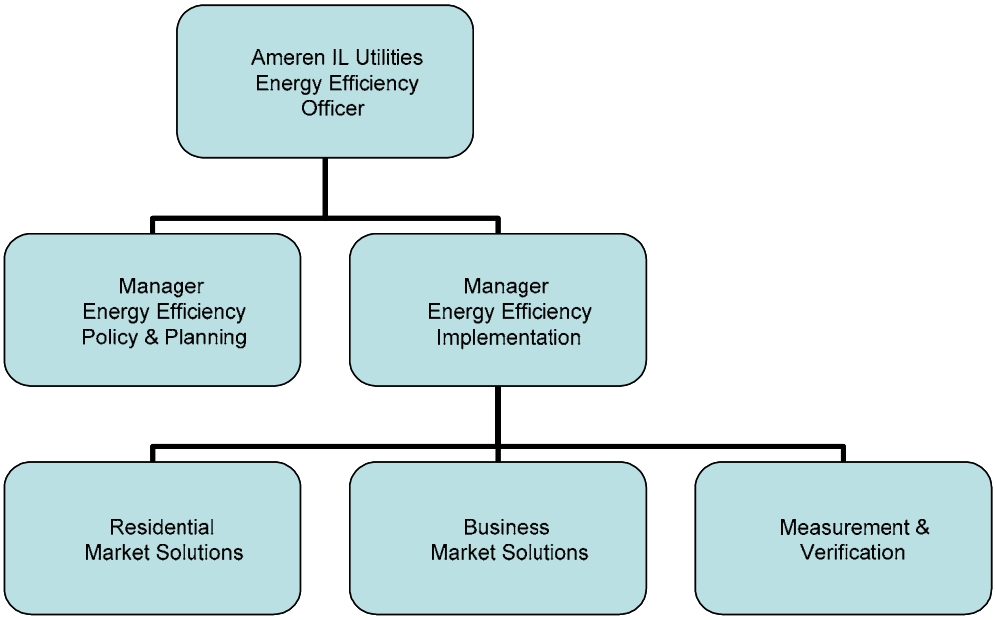
evaluation contractors hired to perform verification services for certain programs (e.g. Small Business Tune-Up and Multifamily).

7.1.4. Program Implementation—External/Internal

For most programs proposed, the Company intends to hire third party contractors. In most cases, implementers will be given the flexibility to propose final program design based on the general templates provided by the Company. This approach allows the Company to gain the benefit of the implementers' experience, and provides the contractor with the flexibility necessary to achieve the performance requirements the Company will set for each contractor. Each implementer will be required to use the Company's tracking and reporting system, and to comply with all EM&V guidelines established for the program

7.2. Management Structure

Figure 6: AIU Organizational Chart



7.3. Tracking and Reporting

An important early implementation activity will be design and installation of a program-wide tracking and reporting system. At this time, a final decision has not been made as to whether existing corporate systems can be configured to serve the function or whether a system will be procured to run on top of corporate systems. In any event, the tracking of gas plan savings and expenditures will use the same platform as used for tracking electric energy efficiency programs. The tracking and reporting system will be required to enable the tracking of all transactions associated with implementation including all customer interactions (including provision of program incentives and services and associated estimated and verified savings) as well as all key internal interactions. The system also will be required to support flexible reporting, and import/export capability to the Company's existing customer accounts, as well as be capable of linking to any web-based program portal. Finally, the system will be required to

enable segregation of gas and electric portfolio and program costs where gas and electric funds are used to support common activities or projects.

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Appendix A.

Description of the Demand-Side Analysis

The portfolio proposed by the Company is the product of a multi-stage analysis process intended to gather and process the information required to determine program and portfolio cost-effectiveness. Each of these steps is described below.

A.1. Cost-Effectiveness Defined

The total resource cost (TRC) test, as it is commonly understood, is defined by the California Standard Practice Manual, developed by the California Public Utilities Commission (CPUC). The test was designed by the CPUC to account for all costs and benefits reasonably expected to accrue as the result of the implementation of a demand-side program. The general form of the TRC as defined by the CPUC is as follows:

TRC = Benefits/Costs

$$BTRC = \sum_{t=1}^{N} \frac{UAC_t + TC_t}{(1+d)^{t-1}} + \sum_{t=1}^{N} \frac{UAC_{at} + PAC_{at}}{(1+d)^{t-1}}$$

$$CTRC = \sum_{t=1}^{N} \frac{PRC_t + PCN_t + UIC_t}{(1+d)^{t-1}}$$

Where:

BTRC = Benefits of the program

CTRC = Costs of the program

UACt = Utility avoided supply costs in year t

UICt = Utility increased supply costs in year t

PRCt = Program Administrator (Utility) program costs in year t

PACat = Participant avoided costs in year t for alternate fuel devices (costs of devices not chosen)

UACat = Utility avoided supply costs for the alternate fuel in year t

TC_t = Tax Credits

PCN_t = Net Participant Costs

The second term in the benefits equation represents the non-gas savings that might result from the implementation of a program designed primarily to save natural gas. For example, UAC_{at} could represent the electricity savings that would be realized in a home as the result of implementing energy efficiency measures intended to reduce the home's heating load. A

common and potent energy efficiency measure is the sealing of a home's heating and cooling ducts to reduce losses. While a gas utility would be interested in this measure as a way to reduce furnace heating consumption (fewer losses mean a furnace needs to run less, thereby using less gas), the measure also would reduce cooling losses during the summer, thus saving electricity as well.

When these other fuel savings are included in the TRC test, the net result typically is that energy efficiency measures that affect a building's heating/cooling load are more cost-effective. In some cases, measures that would not be cost-effective when considering only electric or only gas savings become cost-effective when both sets of savings are considered.

Consistent with the analysis undertaken in support of the Company's electric energy efficiency plan, the cost-effectiveness analysis used for this plan only considers the value of gas savings. The general form of the TRC test used for this plan, therefore, is:

$$BTRC = \sum_{t=1}^{N} \frac{UAC_t}{(1+d)^{t-1}}$$

$$CTRC = \sum_{t=1}^{N} \frac{PRC_t + PCN_t + UIC_t}{(1+d)^{t-1}}$$

The effect of excluding other fuel savings is that fewer measures and programs will be cost-effective.

A.2. Measures and Measure Data

The first step in the analysis process is to collect the set of energy efficiency measures that will be analyzed as the building blocks for demand-side programs. A measure is a specific technology or practice that results in a decrease in the amount of gas used per unit of useful service. A common measure is a low-flow shower head when it is used to replace a typical shower head. The same level of water heating output is provided using a technology that requires much less gas. Other measures might include installation of more efficient commercial heating technologies, improving the shell of a multi-family building, and installing efficient pre-rinse spray valves in restaurants.

Replace–on-Fail versus Retrofit: How Savings and Costs are Counted

As described above, an energy efficient measure is a technology or practice which, when implemented, results in less electricity or gas being used to deliver the same service. How much energy is actually saved depends on how we define the baseline against which savings are measured. Two types of baselines are often considered.

Replace-on-fail baseline: Most pieces of energy-using equipment have finite operating lives, and most consumers do not replace operating equipment before either that equipment fails or, in the consumer's mind, it has reached the end of its useful life. At that point, the consumer must make a decision about what new equipment to purchase. In most cases, there are several options to choose from, each with a different level of energy consumption. When we calculate the energy savings resulting from adoption of a more efficient piece of equipment, we calculate the difference between the energy used by the efficient equipment choice and the energy used by the standard efficiency piece of equipment. Similarly, the costs we count are only the incremental costs of the more efficient alternative over the standard technology. For example, if a homeowner needs to replace their refrigerator, they have a choice between a new refrigerator that meets the basic federal energy efficiency standard or one that meets the higher ENERGY STAR standard. The level of energy savings they would realize by purchasing the ENERGY STAR model is the difference between that model and the standard efficiency new refrigerator. This difference is much lower than the difference between what their old refrigerator used and what the new unit will consume. Similarly, for purposes of the cost-effectiveness analysis we only count the difference in cost between the ENERGY STAR refrigerator and the standard new refrigerator.

Retrofit Baseline: There are some situations in which a working piece of equipment is assumed to be replaced before the end of its useful life or for which there is not an existing baseline. For example, adding insulation to a home is a retrofit measure – the decision is to add or not add insulation and the costs and savings are measured relative to the level of insulation that is already in the home. Similarly a measure that involves properly charging the refrigerant in an existing central air conditioner is considered a retrofit measure, and savings are measured relative to an existing under- or over-charged unit. The cost of the measure is the full cost to send a technician to test and properly charge the system.

The objective of this step is to develop a comprehensive list of energy efficiency measures that will be screened as part of the planning process. The list of measures to be characterized should cover all major end uses within major market segments and customer classes.

There are several sources of measures and associated measure data. The source often used for most standard measures is the Database for Energy Efficiency Resources (DEER) http://www.energy.ca.gov/deer/. This database is maintained by the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) for purposes of utility energy efficiency planning and program design. The database is regularly updated using the results of recent program impact evaluations, market studies and direct surveys of equipment suppliers. In addition to using this database, additional measures were added to the database used for this analysis based on work that ICF International had performed for other utilities, other studies of energy efficiency potential that included measure data and recommendations from the Ameren Illinois Utilities.

The initial set of measures covered the following end uses:

- Residential
    - Space Heating (including thermal integrity measures)
    - Dishwashing
    - Clothes Washing
    - Domestic Hot Water
- Small Business

- HVAC (Heating, Ventilation and Air Conditioning)
- Cooking
- Domestic Hot Water

In addition to the use categories above, measures are distinguished by the sensitivity of their impacts to weather. Non-weather-sensitive measures are those for which associated energy reductions are not greatly influenced by local weather conditions (primarily temperature and humidity). Such measures include water heating technologies, many appliances, and food service equipment. Weather-sensitive measures are those for which energy and demand savings are directly tied to local weather conditions. These measures include all building shell improvements such as insulation, new windows, and all HVAC equipment. This distinction is critical in determining the permissible sources of data for the measures described below.

A.2.1 Measure Characterization

The analysis requires a variety of data for each measure including the following:

- Base technology, energy use, peak demand and cost (equipment, installation and annual operating and maintenance)
- Efficient technology energy use, and cost (equipment, installation and annual operating and maintenance)
- Base and efficient technology useful lifetimes

The values for these variables are taken from a number of sources. Non-weather-sensitive measure data are taken for the most part from the DEER database (http://www.energy.ca.gov/deer/). This database is the most comprehensive, consistent, widely vetted and regularly updated of available sources. In some cases, however, measure cost data have been taken from other sources such as on-line price quotes for appliances, the U.S. EPA's ENERGY STAR calculators available at http://www.energystar.gov, or calls to retailers or installers.

The energy and demand impacts of weather-sensitive measures were estimated using the DOE-2 building energy simulation model.[1] The first step in the simulation process was to develop a representative set of building prototypes. These were:

- Residential sector
  - Gas space heating with central air conditioning
  - Multi-Family gas space heating with central air conditioning
- Small Business sector
  - Food Service

[1] The DOE-2 model was developed with funding from the U.S. Department of Energy (DOE) but now is available in the public domain. ICF International has developed a customized, proprietary version of the model that enables rapid simulation of multiple parametric analyses. The model simulates hourly building energy loads and the performance of building systems and building plant as a function of the average temperature and humidity in a given location and user-specified building characteristics for envelop, heating/cooling equipment and lighting and plug loads. By comparing the hourly energy consumption of a baseline building with the same building modified by the addition of an energy efficiency measure, yields the incremental energy savings associated with the measure, including any interactive effects.

Each of these building types was characterized by a series of inputs pertaining to building shell (floor area, wall area, insulation levels, window and door area and type, construction, orientation, etc) and system (HVAC type and efficiency, duct efficiency, control system, etc.). These characteristics were based on the construction of a typical existing building in the Ameren Illinois Utilities service territory. Each building prototype was then benchmarked in its baseline configuration against Ameren Illinois-specific or regional building type consumption data, where available.

Once the prototypes were benchmarked, the impact of each of the weather-sensitive measures was simulated using normal weather data for the Ameren Illinois territory. The results of the parametric measure simulations were then subtracted from the baseline buildings' performance to yield the monthly gas savings per measure. The hourly gas savings were aggregated to match the costing periods described below.

The estimated program savings are based on building energy simulation of a single home prototype using weather typical to the AIU service area. Baseline gas consumption and, therefore, gas savings can vary substantially as a function of the actual thermal characteristics of a house and the home's location.

Appendix B contains the detailed measure characterization, including the savings values and costs used for the measure screening.

A.3. Measure Screening

Once all required data were compiled, measures were passed through a cost-effectiveness screen. The general form of the TRC test was described above. In the case of measure screening, program administrator costs – variable *PRC* in the equations above – are set to zero, since by definition there are no program costs incurred at this stage.

The method used to calculate the TRC on a measure-by-measure basis was as follows:

- Avoided gas supply costs were provided to us by the Company through year 2020, and extrapolated to year 2028. The extrapolation was done using the Energy Information Administration's 2008 Annual Energy Outlook, which contains estimated gas costs through 2030 for residential and commercial sectors. These costs were provided as 12 monthly values per year.

- The avoided gas supply costs also included an assumed cost of carbon dioxide (CO_2) of $15/ton. The cost per ton was factored into the total avoided gas costs using an emissions factor of 5.34 kilograms of CO_2 per saved therm, based on the Intergovernmental Panel on Climate Change (IPCC) default value. The product of these factors came to an estimate of $0.080/therm in nominal annual terms.

- The savings were aggregated into these same 12 avoided cost periods. Energy savings associated with weather-sensitive measures already were expressed in monthly terms. The monthly values for non-weather-sensitive measures were estimated using load shapes that ICF estimated from its DOE-2 building energy simulation model. The 12 annual avoided cost values were then multiplied by the per unit energy savings in each of the 12 corresponding periods to yield a measure-specific annual avoided cost stream over a 20 year period. The incorporation of time differentiation, where savings that occur

in higher avoided cost periods are given greater weight, adds greater richness to the avoided cost calculation than simply using an annual avoided cost.

- The net present value of a stream of avoided costs, expressed as a $/therm cost for gas was calculated. The discount rate used for the analysis was nine percent.
- Annual measure gas savings were multiplied by the net present value avoided gas costs to estimate the value of the saved gas over the life of the measure.
- The sum of the value of saved gas was divided by the measure incremental cost to yield the Total Resource Cost test benefit-cost ratio.

The measure screening showed 27 residential and 4 small business measures to be cost-effective. The TRC screening results for all measures are shown in Appendix B.

A.4. Program Bundling

Assembling an initial set of programs to consider has three broad elements: Measure bundling, developing program templates, and assembling program data. Each of these are described in more detail below.

A.4.1 Measure Bundling

The objective of measure bundling is to group measures into logical bundles representing "program types". A program type is represented by a specific market segment, and high-level incentive, intervention, and delivery strategies. For example, residential insulation and windows measures passing the probable environmental benefits test might be bundled into a Home Energy Performance program. The bundling process is used because, in reality, very few if any programs are designed and implemented that include only a single measure. Program designers attempt to build programs around combinations of measures that might appeal to a given market and that can be delivered using similar channels.

The bundling reflects best practice as applied to the Company's current level of experience. Energy efficiency program "best practice" is much more a term of art than science; there simply is too much variability across objectives, regulatory structures and program types to enable simple broad conclusions about what is best in every case. What is best practice for a utility that has been designing and managing programs for two decades will be different in some cases from what should be viewed as best for Ameren Illinois .

The generic program types employed were drawn from a review of best practice program information drawn from publications of the American Council for an Energy Efficient Economy (Accessible at http://www.aceee.org/utility/exemplary_programs/index.htm), the Consortium for Energy Efficiency (www.cee.org), and the Energy Trust of Oregon (Accessible at http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3) as well as from the Best Practices web site operated for the California Public Utilities Commission (Accessible at http://www.eebestpractices.com/index.asp), and from ICF International's own internal review of program operated by program administrators across the country. It also is based on a review of programs operated by program administrators across the country often considered to be leaders in the field such as Xcel Energy, NSTAR, Northeast Utilities, Pacific Gas & Electric, the Wisconsin Focus on Energy program; recognizing that these utilities have had much more experience and therefore may be pursuing more complex

programs than would be prudent for Ameren Illinois. Based on the Company's review of these sources, the elements of best practice design include:

- Programs should focus on technologies/market segments with relatively large untapped potential. Program designs that offer prescriptive rebates for common technologies across the entire C&I market are relatively simple to design and administer, and are very effective in tapping into large veins of efficiency potential in water heating, cooking and HVAC systems.

- Programs should leverage existing branding and delivery structures. For example, residential appliance and new homes programs built around the ENERGY STAR brand could leverage the market awareness the brand enjoys.

- Programs should employ simple, straightforward program design.

- Incentives should be targeted at the point in the product value chain that yields the greatest leverage.

- Large customers can be most effectively tapped with custom incentive programs. These programs provide rebates for groups of measures based on calculated savings and have proved to be very effective at generating low cost (to the utility) savings.

- Effective programs require close coordination of marketing, technical support and incentives.

- Effective portfolios represent a mix of education/consumer outreach, technical support and training, and incentive elements, each of which is structured to work with the others.

- When working with upstream market participants such as national retailers or manufacturers, programs will be more effective if they employ structures with which these market participants are familiar.

- While there are exceptions, the most important of which is noted below, the majority of best practice programs have staying power. They become best practice because their sponsors have time to refine both design and implementation. Participation rates climb as program availability becomes known through market networks, and all points in the market chain have time to align with the program.

- Finally, the point above notwithstanding, best practice, both in program design and in implementation looks forward. Even though the immediate focus of a portfolio might be on achieving certain near-term targets, success ultimately is in transforming the market such that consumers make efficient decisions without direct financial incentives. Therefore, best practice requires the Company to look ahead to identify opportunities to move out of some program markets and into others to ensure program resources are efficiently allocated.

Appendix C includes tables that illustrate how the measures that passed the screening process were bundled into program types.

A.4.2 Develop Program Templates

The second step in the process of program bundling was to develop basic program descriptions for each type that outlined key elements of design or implementation that would influence program costs and likely participation. For example, residential home performance programs can be designed and implemented in a variety of ways, each with very different costs and implications for participation. Direct installation of low-flow shower heads in a home by program implementers would create much more certainty regarding installation, but would cost substantially more than an upstream program that bought down the cost of the shower heads at the manufacturer or retailer level. However, the latter approach would inevitably have lower net impacts as some fraction of the shower heads purchased using program incentives would not be installed.

The templates included design and implementation assumptions related to:

- Target market
- Point of intervention in the product or service chain
- Implementation approach (in-house or contracted)
- Market strategy
- Incentive strategy
- Recruiting strategy
- Administrative support (level of internal resources required to manage a program).

A.4.3 Assemble Program Data

Once the templates had been completed, yielding a general picture of the level of program intervention, a variety of program-related data was compiled for purposes of program cost-effectiveness screening. These data were compiled based on a review of other utilities' planning assumptions and program experience as reported by those utilities or others (e.g. ACEEE's compilation of exemplary programs). For purposes of cost-effectiveness screening at the program level, we need only to make an assumption regarding total non-incentive, non-measure-related program costs. Although we attempt to break these costs down into several more discrete categories for purposes of program design, that dis-aggregation is not needed for analysis purposes. Where we were not able to find estimates of these discrete costs, we used estimates of total non-incentive, non-measure costs and normalized these costs relative to incentive costs. In other words, the level of program costs was tied to the level of incentive costs. We prepared a brief summary of program data for a number of program administrators to inform our assumptions regarding program costs and participation. The utilities included PG&E, Southern California Gas Company, Wisconsin Focus on Energy, NSTAR, Northwest Natural, Xcel Energy, CenterPoint-Minnesota,, GasNetworks and Keyspan.

Program-level data included:

- **Program administrative costs** – these are the utility's internal costs (mostly labor and overheads) to administer the program. Absent specific examples from comparable utility programs, an initial assumption was made that program administrative costs

represented approximately 10% of incentive costs. This assumption was based on a comparison of the relative share of incentive costs represented by administrative costs for a number of utilities including PG&E, Southern California Gas, the Wisconsin Focus on Energy Program and Xcel Energy. We tied the cost to the incentive level simply as a way to simplify data input and calculation.

- **Program implementation costs** – these are the costs (mostly labor) associated directly with implementation of a program. Again, these costs were based, where possible, on the costs incurred or assumed by other utilities implementing similar programs. Our initial assumption was that these costs were 35% of incentive costs. For programs requiring more extensive interaction with customers, or which entailed more complex program services or incentive calculations, these costs were increased. For programs with simple implementation structures, the cost fraction was lowered.

- **Program marketing costs** – the costs associated with production of program marketing collateral and the execution of marketing campaigns. Again, the initial assumption was that these costs represented 15% of incentive costs. These costs were increased for programs requiring more mass market outreach, and lowered for those requiring little marketing (such as programs that would be marketed primarily by trade allies).

- **Participation** – The number of incremental and total participants per year. The participation estimates used for each program are Company assumptions. The assumptions were based first on judgments regarding the relative difficulty associated with recruiting customers for specific program elements, the levels of savings expected from the program elements given assumed baseline market conditions, and the complexity of the program elements. The Company focused initially on participation rates for program elements expected to yield the largest shares of program energy savings initially given the nature of the measures, participant cost-effectiveness, the experience of other utilities and so forth. Participation rates for the first two programs were adjusted up to a level that yielded numbers of installations that are consistent with what at least several other utilities have been able to achieve based on available evaluation reports. Participation rates for other programs were then adjusted to fill in any shortfall in therms, taking into account the relative complexity of the program and its expected program costs.

  These participation rates are applied across all measures within a program element. The participation rate is applied to the estimated number of eligible measures per year. This number of eligible measures is, in turn, estimated using the following equation:

Total eligible measures per year = Total Sector Units * Relevance * Number of Technology Units per Sector Unit * Technical Applicability (%) * Not Yet Adopted (%) * Annual Replacement Eligibility (%),

where:

- Total Sector Units = the number of units to which a measure pertains. In the case of a new furnace, Total Sector Units would be the number of homes, for example.

- Relevance = a broad measure of measure applicability based on saturation. For example, in the case of residential furnace measures, the relevance would be the percentage of homes with a gas furnace.

- Number of Technology Units per Sector Unit = the number of measures that can be associated with the basic unit; for example, the number of low-flow showerheads per home.

- Technical Applicability (%) = An adjustment factor that accounts for the fact that the number of measures that could be applied to a basic unit is constrained by a technical limitation. For example, even though there might be 7 faucets in a house, perhaps only 2 are located in areas that use enough water to benefit significantly from faucet aerators.

- Not Yet Adopted (%) = The percentage of the total number of measures that would be technically applicable that have not yet been converted to the efficient alternative. This parameter is equal to 1.0 minus measure saturation.

- Annual Replacement Eligibility (%) = The number of eligible measures that can be installed each year. For replace-on-fail measures this annual replacement fraction is equal to 1/base measure lifetime. For retrofit measures, this fraction essentially is 100%.

The resulting number is multiplied by the annual program participation rate to yield the number of measures installed per year. For the residential sector, the 2003 MEEA *Illinois Residential Market Analysis* was used to provide data on relevance, technology units per sector and the not-yet-adopted fractions. Total sector units were based on Ameren Illinois' customer and sales data. Commercial and industrial sector data were largely unavailable for the Ameren Illinois territory. Total sector units were derived from sector sales data for Ameren Illinois, U.S. Energy Information Administration (EIA) data on the regional breakdown of C&I sales by building type, SIC code, and end use. A recent Kema analysis of energy efficiency potential provided for Xcel's Colorado territory was used to develop estimates of technology units per sector, technical applicability and the not-yet-adopted fraction. The values for these variables are included with the measure descriptions in Appendix B.

- **Incentive costs** – including the financial incentive costs as well as the value of any equipment and labor associated with direct installation of measures. Incentives were set in one of two ways. Incentives were directly set as a dollar amount per measure in for a relatively small set of the most common measures expected to be implemented, such as pre-rinse spray valves. These levels were based generally on a review of the incentive levels offered by other utilities. For the rest of the measures, the incentive level was calculated as the amount required to reduce customer payback levels to 2.0 years for small business customers and 1.0 years for residential customers. The required payback level often is the subject of considerable debate. Generally, small business customers are observed to require rates of return on such projects of 50 percent or higher. Residential customers often appear to require even higher rate of return – on the order of 100 percent. This calculation was performed on a measure-by-measure basis and, as such, yielded a range of incentive levels for similar measures to the extent that these measures are employed in different building types. We view these calculated levels are simply approximations to be used primarily for budgeting purposes. During process of final program design, the specific incentive levels will be revisited.

- **Savings adjustment factors.**

Program cost-effectiveness is based on program net savings – savings that are attributable directly to a program after netting out so-called free riders. Net savings are accounted for in the calculation by multiplying verified gross program savings by what is know as the net-to-gross ratio. The net-to-gross (NTG) ratio is the ratio of the verified net savings for a program to the verified gross savings. The difference between net and gross savings is represented by the savings realized by customers who (1) would have implemented an efficiency measure even in the absence of a program incenting it (free riders) and (2) did adopt a measure that is promoted by a program after having been influenced by the program, but without taking the program incentive (free drivers or spillover). Although both effects should be accounted for in the calculation of a NTG ratio, frequently evaluations have only measured the free rider effect and thus data often are not available for the spillover effect. The effect of applying the NTG ratio, therefore, is to reduce program savings and cost-effectiveness (since program costs are not reduced by the NTG ratio).

Appendix D provides a listing of the program cost and participation assumptions for each program element.

A.5. Program Screening

Once program data were assembled, the program elements were screened for cost-effectiveness using the TRC test. Conceptually, the process was the same as described above in relation to the measure screening. The key steps included:

- Calculating the value of measure benefits using the same approach as described earlier under measure screening
- Summing these benefits over all measures included in a program.
- Reducing these gross benefits by the realization rate and NTG ratios.
- Calculating the total incentive costs by summing over the number of measures projected.
- Summing the total measure incremental costs over all measures included in a program.
- Calculating the total program costs. These costs were either manually input into the cost-effectiveness model based on other utility program experience or were calculated as a fraction of total incentive costs as described above.
- Calculating the TRC test benefit-cost ratio

A.6. Portfolio Construction

Once program elements were screened, those programs passing the TRC test were passed to the portfolio construction and screening stage. This stage was designed to allow adjustment in the participation levels and program element budgets, including budgets for cross-cutting activities such as education, awareness building, training, evaluation and management: such that the total portfolio estimated gas savings targets would be met at or below the spending cap.

In addition, this step was guided by objectives to establish a foundation for subsequent years, create consumer value, and ensure portfolio diversity across end uses and customer classes.

The process of developing the final portfolio was necessarily iterative, as program element participation rates and costs were adjusted to yield a mix of program elements satisfying not only the savings targets and spending constraints, but the Company's overall portfolio design goals as well.

Appendix B: Measure Information

Appendix B contains the measure-level information from the gas energy efficiency potential model developed by ICF International for Ameren Illinois Utilities. It is divided into five sections.

Page B-2 contains the basic measure information describing the base and efficient technologies, whether the measure's savings are weather-sensitive, the end-use application (heating, domestic hot water, etc.) and the unit by which costs and savings are denominated. The next three columns contain the inputs to and final results of the measure level Total Resource Cost (TRC) test. These inputs include the measure's lifetimes, incremental costs, annual gas energy (therm) savings.

Page B-3 shows the market baseline and appropriate factors to determine how many units of each measure could technically be applied. The market baseline determination begins by establishing the eligible population of measures that can be replaced by more efficient measures. This "gross" population is then reduced by a series of factors shown below to account for the relevance of the measure, technical feasibility of measure replacement, the fraction of the total number of eligible baseline measures that are not yet efficient (based on the definition of the efficient measure), and the annual replacement eligibility which represents the fraction of the baseline stock that is assumed to turn over each year. Note that, for most measures, Ameren Illinois-specific baseline information was very limited. Thus, in many cases, ICF assumptions, or state, regional or national data were used to developed proxy values.

Total Sector Units (eg, # of Homes)	# Technology Units per Sector Unit	Relevance (eg, % of Homes with gas)	Technical Applicability (%)	Not Yet Adopted (%)	Annual Replacement Eligibility (%)	Total Applicable Technology Units

These variables work together according to the following equation:

Total Sector Units * Technology Units per Sector Unit * Relevance (%) * Technical Applicability (%) * Not Yet Adopted (%) * Annual Replacement Eligibility (%) = Total Applicable Technology Units

This section also contains two columns that indicate whether a measure should be classified as a gas measure (Gas Measure), and if it is included (Gas Include?) in a gas program (1 indicates inclusion; 0 indicates exclusion).

Page B-4 shows in which programs the measures are included, as well as whether the measures are classified as a "special measure." These special measures are used so that specific incentive levels can be set for those measures, separately from other measures in a certain program. Special measures include pre-rinse spray valves, faucet aerators, etc. This page also shows the incentive levels offered for the measures, the number of efficient technology installations, and gas energy (therm) savings for each year of the three year program period.

Page B-5 shows the sources used for the measure names, costs, savings, lifetimes, and participation. In addition, the DEER Measure ID is shown for DEER measures; for the measures taken from a report by RLW Analytics, the appropriate RLW Measure ID is included.

Pages B-6 to B-8 show the Residential and Non-Residential inputs that were used in the DOE-2 simulations.

ICF ID	Efficient Technology	Sub Division	Weather Sensitive?	End Use	Base Efficiency Definition	Unit Name	Measure Life	Total Incremental Cost	Annual Thm Savings	Weighted Gas TRC
9	Increase duct sizes or add new ducts	Detached	WS	Gas Furnace / Central AC	70% DSE	Home	18	950	82	1.42
17	Duct Leakage 5%	Detached	WS	Gas Furnace / Central AC	0.25	Home	18	486	189	5.49
29	Duct Insulation R-8	Detached	WS	Gas Furnace / Central AC	R-4	Home	20	600	38	0.83
37	Ceiling Insulation (R-30)	Detached	WS	Gas Furnace / Central AC	Ceiling Insulation (R-7)	Home	20	288	90	4.49
41	Ceiling Insulation (R-30)	Detached	WS	Gas Furnace / Central AC	Ceiling Insulation (R-11)	Home	20	288	55	2.83
45	R-11 Wall Insulation	Detached	WS	Gas Furnace / Central AC	Wall R-1.01 (Air Gap)	Home	20	1,866	743	5.24
49	Efficient Basement Insulation (Existing)	Detached	WS	Gas Furnace / Central AC	R-0	Home	20	678	51	0.90
52	Infiltration = 0.35 ACH	Detached	WS	Gas Furnace / Central AC	0.8 ACH	Home	20	500	275	7.32
55	Infiltration = 0.35 ACH	Multifamily	WS	Gas Furnace / Central AC - MF	0.8 ACH	Home	20	500	85	2.36
56	Single Pane Win. w/ Storm Win. (Existing)	Detached	WS	Gas Furnace / Central AC	U-value 0.75/ SHGC 0.6	Home	20	4,406	30	0.08
60	Low-E Windows (Existing)	Detached	WS	Gas Furnace / Central AC	U-value 0.75/ SHGC 0.6	Home	20	3,194	132	0.70
64	Efficient Windows (Existing)	Detached	WS	Gas Furnace / Central AC	U-value 0.75/ SHGC 0.6	Home	20	3,569	67	0.41
84	ENERGY STAR Dishwasher (Existing)	Detached	NWS	Gas Furnace / Central AC	0.46 EF	Home	13	50	2	2.08
87	ENERGY STAR Dishwasher (Existing)	Multifamily	NWS	Gas Furnace / Central AC - MF	0.46 EF	Home	13	50	1	0.42
94	Programmable Thermostat (Existing)	Detached	WS	Gas Furnace / Central AC	Manual Thermostat	Home	12	24	21	26.70
97	Programmable Thermostat (Existing)	Multifamily	WS	Gas Furnace / Central AC - MF	Manual Thermostat	Home	12	24	4	2.04
98	Faucet Aerators (Existing)	Detached	NWS	Gas Furnace / Central AC	100% Faucet Use	Home	9	13	15	9.51
101	Faucet Aerators (Existing)	Multifamily	NWS	Gas Furnace / Central AC - MF	100% Faucet Use	Home	9	13	3	1.93
102	Low Flow Shower Heads (Existing)	Detached	NWS	Gas Furnace / Central AC	100% Hot water Shower Usage	Home	10	38	41	8.12
106	Hot Water Pipe Insulation (Existing)	Detached	NWS	Gas Furnace / Central AC	R-0	Home	15	235	46	1.96
109	Hot Water Pipe Insulation (Existing)	Multifamily	NWS	Gas Furnace / Central AC - MF	R-0	Home	15	180	34	1.81
110	Hot Water Insulation (Existing)	Detached	NWS	Gas Furnace / Central AC	R-0	Home	15	20	41	19.20
114	Doors R-4 (Existing) to R-8	Detached	NWS	Gas Furnace / Central AC	R-4	Home	20	190	10	0.85
118	Ceiling Insulation (R-38)	Detached	WS	Gas Furnace / Central AC	Ceiling Insulation (R-7)	Home	20	365	98	3.79
121	Ceiling Insulation (R-38)	Multifamily	WS	Gas Furnace / Central AC - MF	Ceiling Insulation (R-7)	Home	20	429	16	0.60
122	Ceiling Insulation (R-38)	Detached	WS	Gas Furnace / Central AC	Ceiling Insulation (R-11)	Home	20	365	64	2.47
125	Ceiling Insulation (R-38)	Multifamily	WS	Gas Furnace / Central AC - MF	Ceiling Insulation (R-11)	Home	20	429	11	0.39
146	ENERGY STAR Home (New)	Detached	WS	Gas Furnace / Central AC	Baseline	Home	18	893	131	2.23
189	Boiler-Reset	Retail	WS	Chiller & Boiler	Constant hot water temperature	1 building	10	1,668	48	0.87
201	Ceiling Insulation	Lodging	WS	Chiller & Boiler	Vintage	1000 sq ft	20	616	6	0.12
202	Ceiling Insulation	Retail	WS	Chiller & Boiler	Vintage	1000 sq ft	20	616	10	0.28
203	Ceiling Insulation	Small Business	WS	Chiller & Boiler	Vintage	1000 sq ft	20	616	19	0.62
612	High Efficiency Gas Fryer	Food Service	NWS	Cooking	Normal Fryer	Fryer	12	2,583	438	1.36
613	High Efficiency Gas Griddle	Food Service	NWS	Cooking	Normal Griddle	Griddle	12	2,102	219	0.84
959	90% Efficient Furnace	Detached	WS	Gas Furnace / Central AC	78% Efficient Furnace	Home	18	537	166	3.41
960	96% Efficient Furnace	Detached	WS	Gas Furnace / Central AC	78% Efficient Furnace	Home	18	772	234	3.35
961	MF Efficient Boiler	Multifamily	WS	Gas Furnace / Central AC - MF	Base Boiler	1 Building	20	1,946	658	3.96
962	Efficient Boiler	Food Service	WS	HVAC	Base Boiler	1 Building	20	1,101	319	3.38
963	90% Efficient Commercial Furnace	Multifamily	WS	Gas Furnace / Central AC - MF	80% Efficient Commercial Furnace	1 Building	18	3,633	1,586	4.77
964	85% Efficient Commercial Furnace	Food Service	WS	HVAC	80% Efficient Commercial Furnace	1 Building	18	2,056	386	2.05
965	R-11 Wall Insulation	Multifamily	WS	Gas Furnace / Central AC - MF	No Wall Insulation	1 Building	20	31,733	3,642	1.34
966	Efficient Water Heater	Detached	NWS	Hot water	Base Water Heater	Home	13	175	10	0.47
969	Energy Efficient pre-rinse spray valve	Food Service	NWS	Hot water	2.13+ GPM	1 unit	5	68	290	17.78
970	Low-e Double Pane Windows	Detached	WS	Gas Furnace / Central AC	Double Pane Windows	Home	20	772	99	1.53
971	Low Income - no Furnace	Detached	WS	Gas Furnace / Central AC	Low Income - Base case	Home	20	5,152	521	1.56
972	Low Income - with Furnace	Detached	WS	Gas Furnace / Central AC	Low Income - Base case	Home	20	7,218	618	1.21

ICF ID	Efficient Technology	Sub Division	Total Sub Division Units	Technology Units per Sub Division Unit	Relevance	Technical Applicability	Not Yet Adopted	Annual Replacement Eligibility	Total Applicable Technology Units	Gas Measure?	Gas Include?
9	Increase duct sizes or add new ducts	Detached	1,000,000	100%	84%	90%	70%	0	29,498	1	1
17	Duct Leakage 5%	Detached	1,000,000	100%	84%	90%	73%	0	30,762	1	1
29	Duct Insulation R-8	Detached	1,000,000	100%	84%	90%	92%	0	35,009	1	0
37	Ceiling Insulation (R-30)	Detached	1,000,000	100%	84%	100%	9%	0	3,881	1	1
41	Ceiling Insulation (R-30)	Detached	1,000,000	100%	84%	100%	9%	0	3,881	1	1
45	R-11 Wall Insulation	Detached	1,000,000	100%	84%	100%	27%	0	11,146	1	1
49	Efficient Basement Insulation (Existing)	Detached	1,000,000	100%	84%	100%	88%	0	36,974	1	0
52	Infiltration = 0.35 ACH	Detached	1,000,000	100%	84%	100%	75%	0	31,500	1	1
55	Infiltration = 0.35 ACH	Multifamily	51,000	100%	84%	100%	75%	0	1,607	1	1
56	Single Pane Win. w/ Storm Win. (Existing)	Detached	1,000,000	100%	84%	100%	64%	0	27,006	1	0
60	Low-E Windows (Existing)	Detached	1,000,000	100%	84%	100%	25%	0	10,500	1	0
64	Efficient Windows (Existing)	Detached	1,000,000	100%	84%	100%	25%	0	10,500	1	0
84	ENERGY STAR Dishwasher (Existing)	Detached	1,000,000	100%	84%	77%	97%	0	48,062	1	1
87	ENERGY STAR Dishwasher (Existing)	Multifamily	51,000	100%	84%	77%	97%	0	2,451	1	0
94	Programmable Thermostat (Existing)	Detached	1,000,000	100%	84%	100%	53%	0	37,100	1	1
97	Programmable Thermostat (Existing)	Multifamily	51,000	100%	84%	100%	90%	0	3,213	1	1
98	Faucet Aerators (Existing)	Detached	1,000,000	100%	84%	86%	90%	0	72,545	1	1
101	Faucet Aerators (Existing)	Multifamily	51,000	100%	84%	100%	90%	0	4,284	1	1
102	Low Flow Shower Heads (Existing)	Detached	1,000,000	100%	84%	100%	90%	0	75,600	1	1
106	Hot Water Pipe Insulation (Existing)	Detached	1,000,000	100%	84%	100%	90%	0	50,400	1	1
109	Hot Water Pipe Insulation (Existing)	Multifamily	51,000	100%	84%	100%	90%	0	2,570	1	1
110	Hot Water Insulation (Existing)	Detached	1,000,000	100%	84%	100%	96%	0	53,760	1	1
114	Doors R-4 (Existing) to R-8	Detached	1,000,000	100%	84%	100%	90%	0	37,800	1	0
118	Ceiling Insulation (R-38)	Detached	1,000,000	100%	84%	100%	12%	0	4,935	1	1
121	Ceiling Insulation (R-38)	Multifamily	51,000	100%	84%	100%	12%	0	252	1	0
122	Ceiling Insulation (R-38)	Detached	1,000,000	100%	84%	100%	12%	0	4,935	1	1
125	Ceiling Insulation (R-38)	Multifamily	51,000	100%	84%	100%	12%	0	252	1	0
146	ENERGY STAR Home (New)	Detached	7,106	100%	84%	100%	90%	1	5,372	1	1
189	Boiler-Reset	Retail	1,000	100%	100%	75%	75%	0	56	1	0
201	Ceiling Insulation	Lodging	1,000	100%	100%	75%	75%	0	28	1	0
202	Ceiling Insulation	Retail	1,000	100%	100%	75%	75%	0	28	1	0
203	Ceiling Insulation	Small Business	1,000	100%	100%	75%	75%	0	28	1	0
612	High Efficiency Gas Fryer	Food Service	1,000	100%	100%	75%	100%	0	63	1	1
613	High Efficiency Gas Griddle	Food Service	1,000	100%	100%	75%	100%	0	63	1	1
959	90% Efficient Furnace	Detached	1,000,000	100%	84%	20%	77%	0	7,187	1	1
960	96% Efficient Furnace	Detached	1,000,000	100%	84%	60%	77%	0	21,560	1	1
961	MF Efficient Boiler	Multifamily	1,700	100%	21%	80%	95%	0	14	1	1
962	Efficient Boiler	Food Service	26,000	100%	25%	100%	95%	0	309	1	1
963	90% Efficient Commercial Furnace	Multifamily	1,700	100%	63%	100%	95%	0	57	1	1
964	85% Efficient Commercial Furnace	Food Service	26,000	100%	75%	100%	95%	0	1,667	1	1
965	R-11 Wall Insulation	Multifamily	1,700	100%	84%	100%	95%	0	68	1	1
966	Efficient Water Heater	Detached	1,000,000	100%	75%	80%	95%	1	1,667	1	0
969	Energy Efficient pre-rinse spray valve	Food Service	100,000	100%	84%	80%	95%	0	32,558	1	1
970	Low-e Double Pane Windows	Detached	1,000,000	100%	90%	80%	95%	0	684	1	1
971	Low Income - no Furnace	Detached	100,000	100%	100%	100%	100%	0	7,600	1	1
972	Low Income - with Furnace	Detached	100,000	100%	100%	100%	100%	0	7,600	1	1

ICF ID	Efficient Technology	Sub Division	Gas Program	Gas Special Measure	Gas Incentive per Unit	Gas Installations			Total Gas Incentive Costs			Total Gas Therm Savings		
						2009	2010	2011	2009	2010	2011	2009	2010	2011
9	Increase duct sizes or add new ducts	Detached	Home Energy Performance		$481	590	796	885	$283,508	$382,735	425,261	38,816	52,402	58,224
17	Duct Leakage 5%	Detached	Home Energy Performance		$97	615	831	923	$59,708	$80,606	89,562	93,213	125,837	139,819
29	Duct Insulation R-8	Detached	Residential New HVAC		$404	0	0	0	$0	$0	0	0	0	0
37	Ceiling Insulation (R-30)	Detached	Home Energy Performance		$112	78	105	116	$8,684	$11,724	13,027	5,574	7,525	8,361
41	Ceiling Insulation (R-30)	Detached	Home Energy Performance		$155	78	105	116	$12,029	$16,239	18,043	3,446	4,652	5,169
45	R-11 Wall Insulation	Detached	Home Energy Performance		$642	223	301	334	$143,195	$193,313	214,792	132,526	178,910	198,789
49	Efficient Basement Insulation (Existing)	Detached	Home Energy Performance		$508	0	0	0	$0	$0	0	0	0	0
52	Infiltration = 0.35 ACH	Detached	Home Energy Performance		$111	630	851	945	$69,935	$94,412	104,902	138,412	186,856	207,617
55	Infiltration = 0.35 ACH	Multifamily	Residential Multifamily		$308	161	321	482	$49,488	$98,976	148,464	10,860	21,720	32,580
56	Single Pane Win. w/ Storm Win. (Existing)	Detached	Home Energy Performance		$3,233	0	0	0	$0	$0	0	0	0	0
60	Low-E Windows (Existing)	Detached	Residential Low Income		$1,685	0	0	0	$0	$0	0	0	0	0
64	Efficient Windows (Existing)	Detached	Home Energy Performance		$1,442	0	0	0	$0	$0	0	0	0	0
84	ENERGY STAR Dishwasher (Existing)	Detached	Residential Appliances	Dishwasher	$30	0	0	0	$0	$0	0	0	0	0
87	ENERGY STAR Dishwasher (Existing)	Multifamily	Residential Appliances	Dishwasher	$30	0	0	0	$0	$0	0	0	0	0
94	Programmable Thermostat (Existing)	Detached	Home Energy Performance	Programmable Therm	$12	742	1,002	1,113	$8,904	$12,020	13,356	12,402	16,742	18,603
97	Programmable Thermostat (Existing)	Multifamily	Residential Multifamily	Programmable Therm	$12	321	643	964	$3,856	$7,711	11,567	996	1,992	2,988
98	Faucet Aerators (Existing)	Detached	Home Energy Performance	Faucet Aerator	$10	1,451	1,959	2,176	$14,509	$19,587	21,764	17,564	23,712	26,346
101	Faucet Aerators (Existing)	Multifamily	Residential Multifamily	Faucet Aerator	$10	428	857	1,285	$4,284	$8,568	12,852	1,001	2,001	3,002
102	Low Flow Shower Heads (Existing)	Detached	Home Energy Performance		$9	1,512	2,041	2,268	$13,177	$17,788	19,765	49,021	66,179	73,532
106	Hot Water Pipe Insulation (Existing)	Detached	Home Energy Performance		$155	1,008	1,361	1,512	$156,200	$210,870	234,300	37,005	49,957	55,508
109	Hot Water Pipe Insulation (Existing)	Multifamily	Residential Multifamily		$131	257	514	771	$33,735	$67,470	101,206	7,078	14,155	21,233
110	Hot Water Insulation (Existing)	Detached	Home Energy Performance	Hot Water Insulation	$20	1,075	1,452	1,613	$21,504	$29,030	32,256	34,909	47,128	52,364
114	Doors R-4 (Existing) to R-8	Detached	Residential Low Income		$106	0	0	0	$0	$0	0	0	0	0
118	Ceiling Insulation (R-38)	Detached	Home Energy Performance		$172	99	133	148	$16,958	$22,893	25,437	7,777	10,499	11,665
121	Ceiling Insulation (R-38)	Multifamily	Residential Multifamily		$238	0	0	0	$0	$0	0	0	0	0
122	Ceiling Insulation (R-38)	Detached	Home Energy Performance		$219	99	133	148	$21,572	$29,123	32,358	5,071	6,846	7,606
125	Ceiling Insulation (R-38)	Multifamily	Residential Multifamily		$238	0	0	0	$0	$0	0	0	0	0
146	ENERGY STAR Home (New)	Detached	ENERGY STAR Homes Prog		$475	127	148	169	$60,281	$70,243	80,460	13,327	15,530	17,789
189	Boiler-Reset	Retail	Small Business Tune-up		$291	0	0	0	$0	$0	0	0	0	0
201	Ceiling Insulation	Lodging	Small Business Tune-up		$462	0	0	0	$0	$0	0	0	0	0
202	Ceiling Insulation	Retail	Small Business Tune-up		$327	0	0	0	$0	$0	0	0	0	0
203	Ceiling Insulation	Small Business	Small Business Tune-up		$266	0	0	0	$0	$0	0	0	0	0
612	High Efficiency Gas Fryer	Food Service	Small Business Food Service		$646	13	25	41	$8,070	$16,141	26,229	4,380	8,760	14,235
613	High Efficiency Gas Griddle	Food Service	Small Business Food Service		$526	13	25	41	$6,570	$13,139	21,352	2,190	4,380	7,118
959	90% Efficient Furnace	Detached	Residential New HVAC		$134	503	1,006	1,509	$67,543	$135,086	202,629	66,666	133,332	199,998
960	96% Efficient Furnace	Detached	Residential New HVAC		$193	1,509	3,018	4,528	$291,446	$582,892	874,338	282,733	565,466	848,199
961	MF Efficient Boiler	Multifamily	Residential Multifamily		$486	1	3	4	$660	$1,320	1,980	714	1,427	2,141
962	Efficient Boiler	Food Service	Small Business Tune-up		$275	15	31	46	$4,249	$8,499	12,748	3,937	7,874	11,812
963	90% Efficient Commercial Furnace	Multifamily	Residential Multifamily		$908	6	11	17	$5,133	$10,267	15,400	7,174	14,348	21,522
964	85% Efficient Commercial Furnace	Food Service	Small Business Tune-up		$514	83	167	250	$42,839	$85,678	128,518	25,752	51,505	77,257
965	R-11 Wall Insulation	Multifamily	Residential Multifamily		$7,933	7	14	20	$53,811	$107,622	161,433	19,764	39,529	59,293
966	Efficient Water Heater	Detached	Residential Appliances		$131	0	0	0	$0	$0	0	0	0	0
969	Energy Efficient pre-rinse spray valve	Food Service	Small Business Food Service	Spray Valve	$68	1,520	3,040	4,940	$103,360	$206,720	335,920	352,640	705,280	1,146,080
970	Low-e Double Pane Windows	Detached	Home Energy Performance		$193	152	205	228	$29,318	$39,579	43,976	12,094	16,327	18,141
971	Low Income - no Furnace	Detached	Residential Low Income		$3,961	33	41	54	$130,703	$163,379	212,392	17,194	21,492	27,940
972	Low Income - with Furnace	Detached	Residential Low Income		$6,028	3	4	5	$19,893	$24,867	32,327	2,038	2,548	3,312

ICF ID	Efficient Technology	Sub Division	Measure name source	Measure lifetime source	Measure savings source	Measure cost source	RLW Measure ID	DEER Measure ID
9	Increase duct sizes or add new ducts	Detached	RLW	DEER	DOE-2 (ICF)	RLW	3	
17	Duct Leakage 5%	Detached	RLW	DEER	DOE-2 (ICF)	DEER	5	D03-458
29	Duct Insulation R-8	Detached	RLW	DEER	DOE-2 (ICF)	RLW	8	
37	Ceiling Insulation (R-30)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	12	D03-422
41	Ceiling Insulation (R-30)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	13	D03-422
45	R-11 Wall Insulation	Detached	RLW	DEER	DOE-2 (ICF)	DEER	14	D03-438
49	Efficient Basement Insulation (Existing)	Detached	ICF	DEER	DOE-2 (ICF)	DEER	15	D03-426
52	Infiltration = 0.35 ACH	Detached	RLW	DEER	DOE-2 (ICF)	RLW	16	D04-439
55	Infiltration = 0.35 ACH	Multifamily	RLW	DEER	DOE-2 (ICF)	RLW	16	D04-439
56	Single Pane Win. w/ Storm Win. (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	17	D03-446
60	Low-E Windows (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	18	D03-448
64	Efficient Windows (Existing)	Detached	ICF	DEER	DOE-2 (ICF)	DEER	19	D03-449
84	ENERGY STAR Dishwasher (Existing)	Detached	ICF	DEER	DOE-2 (ICF)	EPA	25	D03-952
87	ENERGY STAR Dishwasher (Existing)	Multifamily	ICF	DEER	DOE-2 (ICF)	EPA	25	D03-953
94	Programmable Thermostat (Existing)	Detached	ICF	DEER	DOE-2 (ICF)	DEER	27	D03-401
97	Programmable Thermostat (Existing)	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER	27	D03-401
98	Faucet Aerators (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	28	D03-934
101	Faucet Aerators (Existing)	Multifamily	RLW	DEER	DOE-2 (ICF)	DEER	28	D03-934
102	Low Flow Shower Heads (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	29	D03-937
106	Hot Water Pipe Insulation (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	DEER	30	D03-936
109	Hot Water Pipe Insulation (Existing)	Multifamily	RLW	DEER	DOE-2 (ICF)	DEER	30	D03-936
110	Hot Water Insulation (Existing)	Detached	RLW	DEER	DOE-2 (ICF)	ICF	31	
114	Doors R-4 (Existing) to R-8	Detached	ICF	DEER	DOE-2 (ICF)	ICF		
118	Ceiling Insulation (R-38)	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-422
121	Ceiling Insulation (R-38)	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER		D03-422
122	Ceiling Insulation (R-38)	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-422
125	Ceiling Insulation (R-38)	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER		D03-422
146	ENERGY STAR Home (New)	Detached	ICF	DEER	DOE-2 (ICF)	DEER		Multiple
189	Boiler-Reset	Retail	DEER	DEER	DOE-2 (ICF)	DEER		D03-045
201	Ceiling Insulation	Lodging	DEER	DEER	DOE-2 (ICF)	DEER		D03-013
202	Ceiling Insulation	Retail	DEER	DEER	DOE-2 (ICF)	DEER		D03-013
203	Ceiling Insulation	Small Business	DEER	DEER	DOE-2 (ICF)	DEER		D03-013
612	High Efficiency Gas Fryer	Food Service	DEER	DEER	DEER	DEER		D03-904
613	High Efficiency Gas Griddle	Food Service	DEER	DEER	DEER	DEER		D03-905
959	90% Efficient Furnace	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-410
960	96% Efficient Furnace	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-413
961	MF Efficient Boiler	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER		D03-66
962	Efficient Boiler	Food Service	ICF	DEER	DOE-2 (ICF)	DEER		D03-66
963	90% Efficient Commercial Furnace	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER		D03-410
964	85% Efficient Commercial Furnace	Food Service	ICF	DEER	DOE-2 (ICF)	DEER		D03-410
965	R-11 Wall Insulation	Multifamily	ICF	DEER	DOE-2 (ICF)	DEER		D03-410
966	Efficient Water Heater	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-938
969	Energy Efficient pre-rinse spray valve	Food Service	ICF	Fisher Nickel	Fisher Nickel	Fisher Nickel		
970	Low-e Double Pane Windows	Detached	ICF	DEER	DOE-2 (ICF)	DEER		D03-452/3
971	Low Income - no Furnace	Detached	ICF	DEER	DOE-2 (ICF)	ICF		
972	Low Income - with Furnace	Detached	ICF	DEER	DOE-2 (ICF)	ICF		

Standard Inputs for ICF's DOE-2 Residential Model

	Single Family Detached	Multifamily
Architectural Information		
Square Feet per Floor	850	1000
Number of Stories	2	1
Window Distribution (F:B:L:R)	50% : 25% :12.5% :12.5%	50% : 0% : 50% : 0%
Window Area to Wall Area Ratio	14%	12%
Foundation Configuration	Basement	Slab
Locations	Peoria (IL), Springfield (IL)	Peoria (IL), Springfield (IL)
Number of Bedrooms	3	2
Aspect Ratio	2:1	1:2
Shell Information		
Wall Construction	2" x 4", 16" o.c.	2" x 4", 16" o.c.
Wall Insulation R-value	11	11
Wall Sheathing R-value	1	1
Door R-Value	1.54	1.54
Ceiling Type	Flat / Attic	Flat / Attic
Roof Solar Absorptivity	0.75	0.75
Attic Insulation R-Value	11	11
Basement Wall Insulation R-Value	0	0
Window U-Value	0.75	0.75
Window SHGC	0.6	0.75
Infiltration Air Change Rate per Hour	0.8	0.8
Systems Information		
System Type	AC with Gas Furnace	AC with Gas Furnace / Boiler
Cooling Capacity in Tons	Auto sized	Auto sized
Cooling Efficiency (SEER)	9.17	9.17
Fuel Heating Efficiency (% AFUE)	78	78 / 80
Elec Heating Efficiency (COP)	NA	NA
Ventilation Rate	None	None
Duct Leakage (%)	15	0
Duct Location	Attic	Conditioned Space
Duct Insulation (R-Value)	2	2
Thermostat	Manual	Manual
Lighting	Incandescent	Incandescent
Appliances	Standard Efficeincy	Standard Efficeincy
Domestic Hot Water		
DHW Fuel Type	Gas	Gas
DHW Capacity in Gallons	40	40
Energy Factor	0.59	0.59

Standard Inputs for ICF's DOE-2 Commercial Model

Architectural Information	Options
Square Feet per Floor	Any Value
Number of Stories	Any Value
Window Distribution	Any Distribution
Window Area to Wall Area Ratio	Any Value
Occupancy in Sq Ft Per Person	Any Value
Locations	Any TMY2 Weather Location
Shell Information	**Options**
Wall Type	1 - Mass Bldg 2 - Metal Bldg 3 - Steel Frame 4 - Wood Frame & Other
Wall Insulation R-value	Any Value
Wall Sheathing R-value	Any Value
Door R-Value	Any Value
Ceiling Type	1 - Insulation Entirely Above Deck 2 - Metal Building 3 - Attic and Other
Roof Solar Absorptivity	Any Value
Attic Insulation R-Value	Any Value
Slab Insulation R-Value	Any Value
Window U-Value	Any Value
Window SHGC	Any Value
Infiltration Air Change Rate per Hour	Any Value
Systems Information	**Options**
System Type	1 - Commercial Chiller and Boiler 2 - Packaged AC with Gas Furnace 3 - Packaged AC with Boiler 4 - Packaged Heatpump 5 - Split AC with Furnace 6 - Split Heatpump 7 - PTAC with Boiler 8 - PTAC with Gas Furnace 9 - PTAC with Electric
Cooling Capacity in Tons	Any Value
Cooling Efficiency (EER)	Any Value
Fuel Heating Efficiency (% AFUE)	Any Value
Elec Heating Efficiency (COP)	Any Value
Fan Type	1 - Constant Volume 2 - Variable Volume
Ventilation Rate	1 - CFM Per Person 2 - CFM Per Sq Ft of Floor Space
Duct Loss	Any Value
Thermostat	1 - Manual 2 - Programmable
Lighting Density, W Per Sq Ft	Any Value
Misc. Equipment Loads, W Per Sq Ft	Any Value
Sensible Occupant Loads, Btu Per Hr	Any Value
Latent Occupant Loads, Btu Per Hr	Any Value
Domestic Hot Water	**Options**
DHW Fuel Type	1 - Oil 2 - Gas 3 - Electric
DHW Capacity in Gallons	Any Value
Energy Factor	Any Value

Food Service		
Architectural Information		
Square Feet per Floor		3029.5
Number of Stories		2
Window Distribution		2
Window Area to Wall Area Ratio		20%
Occupancy in Sq Ft Per Person		40.0
Locations	Peoria, IL Springfield, IL	
Shell Information		
Wall Type		1
Wall Insulation R-value		13
Wall Sheathing R-value		0
Door R-Value		2
Ceiling Type		1
Roof Solar Absorptivity		0.8
Attic Insulation R-Value		15
Slab Insulation R-Value		19
Window U-Value		0.66
Window SHGC		0.5
Infiltration Air Change Rate per Hour		0.05
Systems Information		
System Type		2
Cooling Capacity in Tons		0
Cooling Efficiency (EER)		9
Fuel Heating Efficiency (% AFUE)		80
Elec Heating Efficiency (COP)		2.8
Fan Type		1
Ventilation Rate		10
Duct Loss		0.05
Thermostat		1
Lighting Density, W Per Sq Ft		1.75
Misc. Equipment Loads, W Per Sq Ft		1.50
Sensible Occupant Loads, Btu Per Hr		
Latent Occupant Loads, Btu Per Hr		
Domestic Hot Water		
DHW Fuel Type	G	
DHW Capacity in Gallons		65
Energy Factor		0.55

Appendix C: Measure Bundling

Appendix C shows how measures were bundled into programs. Below is a table showing the two columns; the first is the program name, and the second shows which measures are included in that program. The table shows only the measures that passed the Total Resource Cost (TRC) test with a benefit-cost ratio greater than or equal to 1.00.

Gas Program	Efficient Technology
ENERGY STAR New Homes	ENERGY STAR Home (New)
Home Energy Performance	Ceiling Insulation (R-30)*
	Ceiling Insulation (R-38)*
	Duct Leakage 5%
	Faucet Aerators
	Hot Water Insulation
	Hot Water Pipe Insulation
	Increase duct sizes or add new ducts
	Infiltration = 0.35 ACH
	Low Flow Shower Heads
	Low-e Double Pane Windows
	Programmable Thermostat
	R-11 Wall Insulation
Residential Appliances	ENERGY STAR Dishwasher**
Residential Low Income	Low Income - no Furnace
	Low Income - with Furnace
Residential Multifamily	90% Efficient Commercial Furnace
	Faucet Aerators
	Hot Water Pipe Insulation
	Infiltration = 0.35 ACH
	MF Efficient Boiler
	Programmable Thermostat
	R-11 Wall Insulation
Residential New HVAC	90% Efficient Furnace
	96% Efficient Furnace
Small Business Tune-up	85% Efficient Commercial Furnace
	Efficient Boiler
Small Business Food Service	Energy Efficient pre-rinse spray valve
	High Efficiency Gas Fryer
	High Efficiency Gas Griddle***

* These efficient technologies were modeled with two base cases, R-7 and R-11 insulation levels.
** The Residential Appliances Program did not pass the program-level TRC, although dishwashers did pass the measure-level TRC.
*** Gas Griddles had a TRC of 0.84 but were included in the Small Business Food Service Program because their inclusion rounds out the program offerings. The program still passes the program-level TRC test even with their inclusion.

Appendix D: Program Information

Program Baselines

The baseline information for the programs identifies the total number of GDS-1 and GDS-2 customers that would be considered eligible for the AIU gas energy efficiency programs. For residential programs, there are 1,000,000 homes single family homes and 51,000 multifamily units. A relevance factor is applied (described in Appendix B) to the measures to ensure that all measure savings are applied to the 840,000 single family homes and 51,000 multi-family units that heated by gas. The estimate of gas heated residences is based on information from the Company and from a study from the Midwest Energy Efficiency Alliance.

For the small business (GDS-2) energy efficiency programs, there are about 26,000 GDS-2 customers. This baseline data was provided by the Company.

Program Participation

Program participation is set to yield the gas savings target within the budget targets consistent with available information from other utilities regarding achievable participation rates. The final participation estimates for each program element, therefore, are the product of an iterative process of adjustment designed to yield, in the end, a portfolio that met targets and that balanced program spending in rough proportion to the contributions to gas revenue from GDS-1 and GDS-2 customers. Participation levels were cross-checked with existing best practice programs including Xcel Energy, the Wisconsin Focus on Energy program, NSTAR, and other gas utilities to ensure that estimated installations of efficiency measures were in the range of reasonable expectation based on other utility experience.

Program Cost Assumptions

Program costs were developed from a review of available incentive and program cost data from other utilities. As an arithmetic convention in our analysis, non-incentive program costs are set as a fraction of incentive costs. Thus, incentive and non-incentive cost data were collected from a number of utility programs for specific programs and non-incentive costs were divided by incentive costs to yield the fractions that were used as a starting point in the analysis to represent implementation, marketing and administrative costs. These fractions were adjusted in many cases based on the judgment of ICF based on the type of program design and the assumed ability to leverage similar programs being offered to the Company's electric customers. The following table summarizes the sources used to estimate the program costs.

Program	Data Sources[1]
Home Energy Performance	Energy Trust of Oregon, Xcel, Wisconsin Focus on Energy, Vermont Gas Systems, KeySpan
ENERGY STAR Homes Program	Focus on Energy, Xcel
Residential Multifamily	Focus on Energy
Residential Low Income	Vermont Gas, KeySpan
Residential New HVAC	Xcel, Northwest Natural, GasNetworks
Small Business Tune-up	Xcel, Southern California Gas
Small Business Food Service Incentives	Xcel, Southern California Gas

Net-to-Gross Ratio Assumptions

The Net-to-Gross (NTG) ratios are based on the California Standard Practice Manual, and are set at 0.80 for all programs except Residential Low Income. That program's NTG is set to 1.0, based on historical program evaluations.

[1] The primary sources for the utility program data were: *Responding to the Natural Gas Crisis: America's Best natural gas Energy Efficiency Programs,* American Council for An Energy Efficient Economy, December 2003, Report No. U035*; Examining the Potential for Energy Efficiency to Help Address the Natural Gas Crisis in the Midwest,* ACEEE, January 2005, Report No. U051; *Southern California gas Company Energy Efficiency Annual Report 2006 Results,* SCG 2006-2008 Expenditures Report, Q ending December 2006 available at http://eega2006.cpuc.ca.gov/DisplayQuarterlyReport.aspx?ID=7; and *2006 Status Report & Associated Compliance Filings Minnesota Natural Gas and Electric Conservation Improvement Program*, Xcel Energy.