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Iowa's Municipal Electric and Gas Utilities
Report of Energy Efficiency Goals – January 31, 2009
Submitted by the
Iowa Association of Municipal Utilities

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Executive Summary

In 2008, the Iowa General Assembly passed Senate File 2386, which included provisions related to energy efficiency programs of Iowa's municipal electric and gas utilities. The legislation required each municipal utility to conduct an assessment of their cost-effective energy efficiency potential, to establish energy efficiency goals, and to report the goals and the programs for achieving the goals to the Iowa Utilities Board by January 31, 2009. The legislation provided for utilities to collaborate on the study of energy efficiency potential and to report jointly. The Iowa Association of Municipal Utilities (IAMU) undertook a study on behalf of all but 16 Iowa municipal electric utilities. The remaining 16 utilities collaborated on a similar study through Missouri River Energy Services (MRES). The IAMU study also included two non-municipal electric utilities and two non-municipal gas utilities.

In this report, IAMU jointly reports the energy efficiency goals and other relevant information for all 136 municipal electric utilities and 51 gas utilities as well as the Amana Society Service Corporation, Farmers Electric Cooperative (Kalona), Allerton Gas Company, and the gas system of Consumers Energy (Marshalltown). The data are reported in three parts. The first is a table that includes 120 municipal electric utilities (all those except the 16 MRES utilities) and all 51 municipal gas utilities. The second is a table showing data for the four non-municipal utilities. The third is a report, included by attachment, for the MRES utilities. Supplemental reports are also attached for Cedar Falls Utilities and Waverly Light & Power. Ames Electric Department and Muscatine Power & Water also provided supplemental information on their energy efficiency programs.

The goals established for all utilities in this report are based on the findings of the energy efficiency potential assessments and, in the case of the MRES members, Cedar Falls Utilities, and Waverly Light & Power, by their supplemental studies. The assessment of potential undertaken by IAMU was conducted by the Energy Center of Wisconsin (ECW). It found that, on average, electric utilities can reduce consumption by an average of 1.1 percent by 2012; gas utilities by can reduce consumption by 0.74 percent. Specific results for each utility were reported to the utilities. In general, utilities set goals for 2010 and 2011 that envision a quick ramp-up to the 2012 potentials described in the assessment.

For 2012, municipal electric utilities included in this report expect to reduce electric consumption through energy efficiency programs by 47,274 MWH. Municipal gas utilities will reduce consumption by 405,832 therms in 2012.

Assessment of Potential Energy and Capacity Savings

The Iowa Association of Municipal Utilities (IAMU) contracted with the Energy Center of Wisconsin (ECW) to conduct an assessment of potential energy and capacity savings. ECW is experienced in conducting such studies. Recently, ECW was selected by the Midwestern Governors Association to compare energy efficiency assessments from other states and Canadian provinces. The IAMU study was completed in March 2009 and the results were reported to utilities through workshops, webinars, and other methods.

The ECW study focused on development of annual energy efficiency potential for 2012 and 2018, ramping up from energy efficiency results in 2006. The two target years were chosen to represent short term and longer term planning horizons. The study also developed estimates of cumulative energy savings through 2018.

While utility-specific data was used extensively in the study, the availability of data related to community demographics, housing stock, and the nature of large customer loads is limited. Nevertheless, specific estimates of potential savings reflect the known characteristics of each service area. In general, utilities whose customer base is characterized primarily by single-family residential units have a higher potential savings than utilities with significant commercial and industrial loads. The 2012 potential savings for electric utilities ranged from 0.83 (Muscatine) percent to 1.7 percent (Orient) and averaged 1.1 percent. Potential municipal gas savings for that target year ranged from 0.71 percent (Sabula) to 0.8 percent (Wellman) and averaged 0.74 percent.[1] The study finds potential to reduce the need for additional generating capacity by 15 MW per year by 2012.

The narrative portion of the ECW report is included in full as **Appendix 1** of this report. The report also includes a number of appendices included as **Appendix 2** of this report.

Energy Efficiency Goals

The legislation also requires that each utility report an energy efficiency goal, the cost to the utility of achieving the goal, a description of each measure that will be used to achieve the goal, and analysis of each measure's cost-effectiveness. This report includes energy efficiency goals for each utility in tabular form. **Appendix 3** includes data for Iowa's municipal electric utilities, though the tables for the 16 MRES electric utilities are shown in the MRES report attached as **Appendix 8**. **Appendix 4** includes data for all municipal gas utilities. **Appendix 5** includes data for two non-municipal electric utilities (Amana Society Service Co. and Farmers Electric Cooperative - Kalona). **Appendix 6** includes data for two non-municipal gas utilities (Allerton Gas Co. and the gas system of Consumers Energy - Marshalltown).

Energy efficiency goals are shown for 2010, 2011, and 2012. The goals are expressed for each year as a percent of average sales for the previous three years. Utilities will measure achievement of their goals by the cumulative deemed savings from their energy efficiency programs. In short, the goal is measured

[1] The ECW study showed a higher potential for gas utilities, but it included gas utility incentives for installation of electric ground-source heat pumps. That was deemed to be unrealistic. The IAMU adjustment to the potential removed that measure, but added weatherization.

from the top down, while performance is measured from the bottom up. This is the standard approach currently used in the industry.

For the 175 separate utilities in the IAMU sponsored assessment, the establishment of energy efficiency goals was a difficult and time-consuming process. Some municipal utilities have been long-term leaders in aggressively pursuing energy efficiency. A concern raised by some of these utilities was that the potential estimated for their utilities may be difficult to achieve because of their past efforts. Other utilities that have offered energy efficiency programs over the years, but with limited staff support and little marketing, had achieved results well below the estimates of potential. Their concern was also whether the potential could be met, given previous results. To assist utilities in the goal-setting process, IAMU developed an analytical tool that calculated a budget necessary to achieve a specified goal or calculated a goal for a specified budget. Goal setting was an iterative process, as some utility governing bodies (city councils or boards of trustees) met only once a month. The IAMU Board of Directors also helped the process by unanimously adopting a recommendation that utilities establish goals for 2012 consistent with the findings of the potential assessment and that they commit two percent of their gross revenues to achieve their goals.

The goal setting process was also complicated for some utilities by the nature of their loads. For example, some small gas utilities have a single large customer or small group of large customers that account for a large portion of retail sales. The Allerton Gas Company has one customer that accounts for 90 percent of its sales. Three of Sioux Center's large gas customers account for 60 percent of its total sales. Grain-dryers in some other communities account for a third to a half of the utility's sales, with sales varying significantly from year to year depending on growing conditions and crop yield. If these very large customers have already invested in energy efficiency improvements or if they reject utility incentives, inclusion of these loads would grossly distort both the goal and efficiencies achieved. In some cases utilities have not included sales to large customers in the calculation of their goals. The tables indicate where such exclusions have been made. Municipal electric utilities with large industrial loads, e.g., Muscatine, included those loads in calculating their goals, acknowledging the uncertainty that this approach raises.

The small size of municipal service territories and the presence of one or a few large customers also make it likely that year-to-year results will be uneven or "lumpy." A significant investment in energy efficiency by one of these customers could, by itself, account for a year or more of a utility's expected results. The same investment made by the customer without a utility incentive would leave the utility well below its goal. As a result of this lumpiness, utilities have adopted goals knowing that actual results will likely exceed or fall short of their stated goal in any given year and that goals are best viewed as guideposts on a longer trajectory of savings potential and achievement.

Another aberration due to utility size and, in this case age, is notable in the goals set by Consumers Energy for its gas service territory in and around a portion of the City of Ankeny. Consumers developed a gas distribution utility to serve customers in a new development for which it also provided electric service. The houses in the development are less than ten years old and the development is not likely to expand further. For Consumers, the opportunities for energy efficiency gains among its gas customers are very limited and its energy efficiency goals necessarily reflect this reality.

It should also be noted that setting energy efficiency goals and implementing, tracking, and reporting progress in meeting the goals is an enormous task, especially for small utilities. Of 136 municipal electric utilities, 84 utilities or 63 percent have fewer than 1,000 customers; 42 utilities or 31 percent have fewer than 500 customers. The median number of customers served by the 51 municipal gas utilities is just 576. Among the smallest of these utilities, it is not uncommon that they have one or two employees. Small utilities achieve economies of scale by working jointly through IAMU and various joint action agencies, but such obligations as conducting potential assessments, setting goals, and implementing a variety of energy efficiency programs, and periodically reporting their progress is daunting and costly to local consumers. That all of the utilities have met the challenge of assessing potential and setting goals is remarkable.

As seen in the tables of utility goals (Appendices 3-6), most utilities adopted lower goals for 2010 and 2011 as they ramp up to the achievable goal established in the study for 2012. To the extent that a utility has set goals for 2012 that are significantly higher than what it has achieved through previous program offerings, the ramp up is necessary to develop relationships with trade allies (e.g., with local HVAC dealers) and for marketing efforts to influence consumer decisions. The average goal for municipal electric utilities is 1.09 percent in 2012. For municipal gas utilities, the average savings in in 2012 is 0.74 percent.

The tables of goals include the utility (identified by the city name), type of utility (gas or electric) the joint action agency affiliation (if applicable), goals for 2010, 2011, and 2012 by fuel, spending level and by percent of average sales for the previous three years

Programs and Measures to Achieve Goals

IAMU recommended that each utility adopt a set of seven common programs, which are described in detail in **Appendix 7**. The seven programs include:

1. Residential and small commercial Energy Star prescriptive appliance rebate programs for 6 electric and gas appliances
2. Residential and Small Commercial Lighting
3. Residential prescriptive rebates for high-efficiency heating, cooling, and gas water heating
4. Residential audit and weatherization incentives
5. Commercial and industrial prescriptive program for lighting, motors, variable frequency drive, large heating and cooling systems, water heating, and refrigeration
6. Non-residential custom programs
7. Customer Education (There are no deemed savings from energy education programs, but customer education is recognized in the law as an integral part of a successful energy efficiency program)

Program Implementation. Although most utilities have adopted the seven core programs listed above, not all programs or not all measures within a program will be implemented. Implementing all programs at once, before they can be funded or marketed is a prescription for confusion and failure. Successful programs are built up over time. With proper tracking of program measures in each utility (a service IAMU will provide for those utilities that request it) managers and policymakers will have periodic

reports on the results of each program and measure. The implementation and marketing of each successive program will be based on the utility's proven progress toward its goal and on the successful deployment and marketing experience of similarly situated utilities. Programs may also need to be modified to be successful. For example, Woodbine Municipal Utilities has long provided incentives and zero interest loans to encourage installation of highly efficient gas furnaces. The incentive level necessary to get remaining customers to install more efficient furnaces is believed by the utility to be higher than that described by IAMU in the recommended program design.

During the first two years, some utilities will achieve their goals through alternative delivery mechanisms described below or through participation in special projects such as grant supported activities described elsewhere in this report.

Other Program Sets. Unless otherwise specified, all utilities included in this report will use the programs and measures recommended by IAMU, with the following exceptions. The programs offered by electric utilities that are members of MRES have been developed through integrated resource planning and other studies. These programs are described in the MRES report attached as **Appendix 8**. Cedar Falls Utilities and Waverly Light Power describe their goals and programs in separate reports attached as **Appendices 10 and 12** respectively. Ames Electric Department and Muscatine Power and Water provide supplemental descriptions of their programs in **Appendices 9 and 11** respectively.

Other sets of programs are identified in the summary table based on joint action affiliation. Utilities affiliated with the South Iowa Municipal Electric Cooperative Association (SIMECA) and the Western Iowa Municipal Electric Cooperative Association (WIMECA) will use programs supported by their respective power suppliers, Central Iowa Power Cooperative and North Iowa Power Cooperative. Utilities affiliated with Wisconsin Public Power, Inc. (WPPI) will use the IAMU programs but will supplement those programs with additional programs supported by WPPI. Supplemental information on the WPPI supported programs are described in **Appendix 13**.

Programs under Development or Consideration. Most utilities will identify opportunities for efficiency improvements in their own operations. Some may offer incentives for shade trees. A variety of low-income programs are under consideration. IAMU is developing a common used appliance pickup program that is expected to be available by late 2010 (some utilities currently operate such programs on their own).

Alternative Delivery. Besides the seven basic programs, many utilities will use alternative delivery mechanisms, including what IAMU describes as "blitz" events. These are neighborhood or community-wide events that promise to be much more cost-effective than traditional programs. Some utilities will also rely on special projects such as those described in "Additional Energy Efficiency Programs" below. Still another example of an alternative delivery mechanism that IAMU expects to see developed is a tool for analyzing utility billing information to calculate a customer-specific energy use index, based on energy used per square foot of building. This will enable utilities to find and concentrate efforts on replacing the least efficient air conditioners, furnaces, and refrigerators. There are also school-based programs that appear to be highly effective in changing consumer behavior. Not all of these alternative delivery mechanisms lend themselves to quantification in the same way that an appliance rebate is

quantified. Nevertheless, it is critically important that these alternatives be tried and reported, as it is unlikely that efficiency levels necessary to respond to climate change can be achieved through continuation of 1990s era rebates.

Projected Costs of Measures and their Cost-Effectiveness Analysis

Unless separately documented in the supplemental reports of MRES, Cedar Falls Utilities, Waverly Light and Power, or Wisconsin Public Power, Inc., the presumed cost of each measure and the analysis of the measure's cost effectiveness is as described in the energy efficiency potential study from the Energy Center of Wisconsin. These data are found in Appendix C of the ECW study, which is found in **Appendix 2** of this report.

Additional Energy Efficiency and Capacity Reduction Projects

Municipal utilities are engaging in many other projects that will affect their approach in achieving their energy efficiency goals. For example, IAMU was recently successful in receiving grant funding for three projects. The first of these is a U.S. Department of Energy Smart Grid Investment Grant covering 40 percent of the cost of installing 32,000 smart thermostats and related infrastructure in 75 utilities. The energy efficiency component of this project would enable participating utilities to meet their stated goals for at least the first two years. A second grant from the Iowa Office of Energy Independence will support the development and implementation of dynamic pricing tariffs, which are expected to result in substantial energy efficiencies due to price-motivated changes in customer behavior. The third grant from the American Public Power Association supports the conduct of three whole-town audits. These audits represent a new way of looking at energy use on a community-wide basis and may introduce more efficient approaches to reducing energy consumption.

Other projects – some supported by grants – are being undertaken by individual municipal utilities and joint action agencies. For example, Greenfield Municipal Utilities will conduct energy audits of more than 150 commercial and industrial facilities. Woodbine Municipal Utilities will leverage funding for implementation of energy efficiency improvements already identified in businesses located in that community. Cedar Falls Utilities will conduct a thermal image fly-over to identify buildings that have potential savings from additional insulation.

It is through the varied approaches of many municipal utilities acting under local control of elected and appointed officials that Iowa will find models for future action to reduce energy consumption and the emissions responsible for changing the earth's climate. In this way, municipal utilities constitute a laboratory for innovation.

Program Marketing

No program can be successful, if it isn't marketed to consumers. A few IAMU members have locally-recognizable marketing themes or brands used to promote their energy efficiency programs. For those that don't, IAMU will develop common marketing materials that should help the success of utility efforts. Plans call for building on the success of IAMU's quarterly consumer publication *eco@home*. Customers of 59 IAMU members already receive *eco@home* – that is just over 30 percent of the state's municipal utility customers. In all, it currently reaches about 139,000 customers in seven states. While

the marketing materials will work with or without the magazine, *eco@home* and *eco@work* will be recognizable to many consumers.

Other Services to Ensure Success

Some municipal utilities will require outside services to ensure success in achieving their goals. To this end, IAMU and/or other municipal joint action agencies will offer a variety of services. Examples of the services planned by IAMU follow.

Tracking and verification. Paper and down-loadable application/installation forms will be developed to support customer applications for various measures. These forms will be used to collect all necessary data to verify customer/vendor eligibility, calculate energy savings, and complete all necessary reports. Computer interactive forms will be available to MRES members and are also planned for development by IAMU. Using information from the standard forms, IAMU will verify eligibility, calculate energy savings or assign deemed savings value from potential study or other generally accepted sources, and, for customer rebate measures, provide documentation for utility's "accounts payable" process.

Custom commercial/industrial programs. Programs for commercial and industrial customers are generally offered on a custom basis. Standard rebates might apply, but lighting, refrigeration, and measures related to motor drives, process heat, refrigeration, and food processing are analyzed on a customer-by-customer basis. These programs need specialized auditors. Program management requires attention to available resources, as a single facility could otherwise absorb the utility's total energy efficiency budget for a year or more. These services will be available from IAMU staff and/or contractors.

Reports to management and policymakers. For most utilities, the goal-setting process will result in increased spending levels for energy efficiency programs. To ensure that such spending achieves the desired results and to modify programs and implementation strategies, management and governing bodies need to see the results on a periodic basis (e.g., monthly or quarterly). A good tracking and verification system will be able to produce reports that clearly show the amount of funds expended by program and measure and the resulting energy efficiency and demand reduction achieved. The reports will show both direct and indirect costs, including marketing and administration. The reports, along with comparative data from other utilities, will provide the basis for program evaluation and modification.

Biannual reports to IUB. With common data collection forms and periodic reports to management, the task of assembling reports to the IUB is relatively straightforward. The first of these biannual reports is due in January 2012. These reports are expected to replace the cycle of two-year reports that municipal utilities have made since 1994.

Joint purchases and contracting. IAMU will initiate competitive bidding processes for products and services that members may wish to use in their energy efficiency programs. These may include but are not limited to joint purchases of CFLs and other energy saving devices, service contracts for energy audits, collection and proper disposal of old appliances, energy education materials, and marketing materials.

Consumer education. IAMU is identifying sources for consumer educational materials, including materials for use in schools. Demonstration equipment, such as a bicycle-powered energy education unit is already available from IAMU along with promotional materials and a 10 foot inflatable model of a compact fluorescent light (CFL). These can be used in schools, energy fairs, and blitz events. IAMU's *eco@home* magazine, described in the marketing section above, also serves an important consumer education purpose.

Blitz events. IAMU will provide support or turn-key management of blitz events. Blitz events are alternative delivery approaches for energy efficiency programs. For example, a blitz event might start with a public-relations campaign (bill stuffers, posters, newspaper ads, presentations to community groups, materials in schools) that culminate in a short-term energy efficiency activity, such as distribution of CFLs and other energy saving devices or neighborhood/community-wide evaluation and installation of attic insulation and weatherization.

Customer research. IAMU will develop or acquire processes for identifying customer interest in or need for energy efficiency improvements. For example, the Association may acquire software that analyses customer billing data and information about building size and age to calculate an efficiency index, such as Btu/ft^2. These indices help a utility to identify what are likely the least efficient buildings and appliances and to target programs and services to improve/replace them. IAMU believes such analysis can yield greater energy savings at lower costs than traditional rebate programs that effectively take money from renters and low-income customers and distribute it to other customers, including those who can afford to buy new efficient appliances and install other energy efficiency measures.

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Appendix 1

Assessment of Energy Efficiency Potential by Energy Center of Wisconsin (Narrative)

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ENERGY EFFICIENCY AND DEMAND RESPONSE POTENTIAL FOR IOWA MUNICIPAL UTILITIES

FOR THE YEARS 2012 AND 2018

June 2009

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EXECUTIVE SUMMARY

The Iowa Association of Municipal Utilities (IAMU) retained the Energy Center of Wisconsin (Energy Center) to conduct an empirical assessment of energy efficiency and demand response potential in IAMU member service territory. The Energy Center drew on the expertise of our co-consultants on this project, GDS Associates. One hundred and fifty four IAMU members elected to participate in this study. The study does not include energy efficiency potential in the service territories of the 17 non-participating IAMU member utilities.

METHODOLOGY

The Energy Center's Microsoft Excel®-based model was used to conduct cost-effectiveness screening and evaluate over 500 unique energy efficiency and demand response measures across three sectors: residential, commercial, and industrial. We employed a bottom-up approach for estimating energy efficiency potential in the residential sector, aggregating savings potential associated with individual types of energy-using equipment found in Iowa homes. We employed a top-down approach for assessing energy efficiency potential in the commercial and industrial sectors, disaggregating savings estimates based on an assumed distribution of energy use within each market segment.

Though we evaluated technical and economic efficiency potential, our analysis focused on estimating achievable energy efficiency potential, or the annual savings that could be achieved by utility programs in a given year. Achievable potential estimates consider cost-effectiveness as well as key time-related and program-related constraints, so they are generally more useful to decision-makers than estimates of technical or economic potential. For 2012 we project what could be achieved under a moderate level of program effort, and for 2018 we project what could be achieved under an aggressive level of program effort. We also conducted a sensitivity analysis to estimate energy efficiency and demand reduction potential under a scenario where carbon prices increase avoided costs by 35 to 70 percent.[1]

As a supplement to base estimates of energy efficiency and demand response potential, the Energy Center conducted additional analyses of demand reduction potential from dynamic energy pricing; estimated energy efficiency potential associated with improvements to utility distribution systems; and presented information on innovative energy efficiency program models that are well-suited for deployment in municipal utility service territories.

RESULTS

Under moderate levels of energy efficiency program effort, we estimate that by 2012 IAMU members could save 58.5 gigawatt hours (GWh) of electric energy per year, reduce peak electric demand by 14.5 megawatts (MW), and save 869,000 therms of natural gas/propane per year. [2] Expressed as a percentage of projected baseline energy sales for 2012, these results are equivalent to 1.1 percent of projected 2012 electricity sales, 1.2 percent of projected peak electric demand, and 1.0 percent of projected natural

[1] Under the carbon scenario, on-peak avoided costs were increased by around 35 percent, and off-peak avoided costs were increased by around 70 percent.
[2] Throughout this study, references to natural gas savings potential include natural gas and propane savings resulting from installation of energy-efficient technologies.

gas/propane sales. Achieving these results would reduce greenhouse gas emissions by approximately 51,000 tons per year.

By 2018, IAMU members could save 69.4 GWh of electric energy per year, reduce peak electric demand by 23.5 MW, and save 1.5 million therms of natural gas/propane per year. These results are equivalent to 1.2 percent of projected 2018 electricity sales, 1.8 percent of peak electricity demand, and 1.8 percent of natural gas sales. Achieving these results would reduce greenhouse gas emissions by approximately 63,000 tons per year.

It is important to note that in the residential sector, natural gas savings estimates are particularly sensitive to input assumptions for a few key energy efficiency measures—specifically, geothermal (ground source) heat pumps and whole-home weatherization and direct install initiatives. These measures are close to the cost-effectiveness threshold, however, and slight changes to input assumptions have a significant effect on savings potential estimates. Our analysis found geothermal heat pumps to be a cost-effective measure for natural gas utilities, but the benefit/cost ratio is between 1.02 and 1.04. Similarly, our analysis found weatherization/direct install efforts for multifamily rental housing (1-4 units) to be cost-effective (benefit/cost ratio of 1.01-1.14), but weatherization/direct install for single family homes was slightly below the cost-effectiveness screen (benefit/cost ratio of 0.81-0.92).

Depending on local market conditions and cost-effectiveness screening assumptions, geothermal heat pumps may not represent an attractive opportunity for some utilities. Conversely, a single family home weatherization/direct install effort could be a desirable program offering for some utilities. Estimates of 2012 residential natural gas savings potential range from 105,000 therms to 560,000 therms, depending on whether these measures are included in the model or not. Estimating energy efficiency potential involves assessment of a broad range of technologies, and there is a range of uncertainty around each of the parameters used in evaluating cost-effectiveness (*e.g.*, incremental costs, measure lifetime, savings, etc.). When it comes to measures with significant energy savings potential, such uncertainty can have a significant effect on overall results. The development of an effective energy efficiency portfolio requires comprehensive planning at the local level, taking local policy objectives and market conditions into account.

We also conducted a sensitivity analysis to assess the effect of a carbon price on energy efficiency and demand reduction potential. We used a price of $30 per ton of carbon dioxide (CO_2) emitted, which increased utility avoided costs by around 35 percent for on-peak power and 70 percent for off-peak power, and around 20 percent for natural gas. With the carbon price in effect, electricity savings potential is approximately 11 percent higher in 2012 and 18 percent higher in 2018. Peak demand reduction potential is around eight percent higher in 2012 and nine percent higher in 2018. Natural gas savings potential is approximately 17 percent higher in 2012 and 25 percent higher in 2018.

Our analysis of the demand reduction potential associated with dynamic pricing estimates that residential time of use pricing could reduce projected 2012 peak demand by 0.4 percent. Critical peak pricing in the residential market is estimated to reduce 2012 peak demand by between 0.8 percent and 1.3 percent. Critical peak rates in the commercial sector are estimated to reduce 2012 peak demand by around 0.5 percent.

The Energy Center's assessment of energy efficiency opportunities on the utility distribution system focused on two technologies: energy efficient transformers and low-loss surge arresters. We estimate that

these technologies could reduce distribution system losses by between 1,400 and 2,700 MWh each year, which is equivalent to 0.03 percent to 0.06 percent of total IAMU electricity sales.

Innovative energy efficiency program models that are well-suited for deployment in municipal utility service territories include community energy initiatives that conduct targeted energy efficiency outreach at the community level; neighborhood-based direct install and retrofit initiatives; behavior-based programs such as home energy audits targeting opportunities to reduce household plug load, and social marketing initiatives that provide feedback on household energy usage; and programs offering upstream incentives to retailers, equipment suppliers, or other market actors to reward increased sales of energy efficient products.

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INTRODUCTION

STUDY SCOPE

On behalf of IAMU, the Energy Center has developed estimates of energy savings and peak demand reduction that could be achieved in IAMU member service territories by the end of 2012 (in four years). Our analysis also includes a longer-range forecast of energy savings and peak demand reduction that could be achieved in IAMU member service territories by the end of 2018 (in ten years). It is important to note that 2012 and 2018 are intended as general reference points rather than absolute deadlines. Decisions about how quickly energy efficiency program activities should be ramped up from current levels to achieve projected levels of energy savings potential involve policy, resource allocation, and program design considerations that must be evaluated by each individual utility.

In general, we place greater emphasis on the 2012 estimates of energy efficiency potential, given the high level of uncertainty associated with a ten-year projection. Energy prices, technology costs, technology development, the state of the economy, and federal climate policy are all factors that will have a dramatic effect on energy efficiency potential in the coming decade. In the current economic downturn these factors are more difficult to predict than ever. As many of the policies and technologies that could have a significant impact in four years are at least visible on the horizon today, the four-year forecast entails a lower degree of uncertainty than the ten-year forecast.

Energy efficiency potential can be assessed at several levels:[3]

- ***Technical potential***: A measurement of the theoretical maximum level of potential energy savings, assuming immediate implementation of all technologically feasible energy efficient technologies regardless of cost-effectiveness.

- ***Economic potential***: A subset of technical potential, assuming immediate implementation of the most cost-effective energy efficient technology for any given application.

- ***Achievable potential***: A measurement of the level of savings that could realistically be achieved by energy efficiency programs within a specified time horizon, given limiting factors such as cost-effectiveness, capital constraints, the useful lifetime of existing installed equipment, program ramp-up time, and other barriers that affect adoption of energy efficiency measures.

As achievable potential estimates take cost-effectiveness as well as key time-related and program-related constraints into account, they are generally more useful to decision-makers than estimates of technical or economic potential. For the purposes of this study, we focus on achievable potential results, but provide context by summarizing technical and economic potential.

It is also important to distinguish between ***annual potential*** and ***cumulative potential***. Annual potential represents the first-year savings attributable to energy efficiency measures installed in a given year. Cumulative potential addresses a specified time period, and represents aggregate savings associated with

[3] National Action Plan for Energy Efficiency (2007). *Guide for Conducting Energy Efficiency Potential Studies*. Prepared by Mosenthal and Jeffrey Loiter, Optimal Energy, Inc. Available at: www.epa.gov/eeactionplan.

measures installed within that time period, factoring in the useful lifetime of installed equipment. Study results are reported in terms of annual potential, unless otherwise indicated.

Efficiency potential estimates do not include the impacts of naturally-occurring efficiency improvement, as such effects are not attributable to energy efficiency program activity. Naturally-occurring efficiency includes energy savings that result from changes in federal equipment efficiency standards, as enacted through statutes such as the Energy Policy Act of 2005 (EPAct 2005) and the Energy Independence and Security Act of 2007 (EISA 2007). Naturally-occurring efficiency can also arise from established state or local codes and standards, such as energy-related building codes. The efficiency improvements associated with current and known future changes to codes and standards are included in the baseline, and thus are not part of the efficiency potential estimates in this study.

Potential estimates include the effects of measure interaction, where installation of an energy efficiency measure that has a primary effect on one end use (such as lighting) produces a corresponding secondary effect on another end use (such as heating or cooling). Interactive effects can cause an increase or decrease in the energy consumption associated with the secondary end use. The majority of interactive effects considered in the analysis are associated with fuel switching measures (e.g., switching from an electric water heater to a natural gas water heater), heating penalties and cooling benefits associated with installation of energy efficient lighting and equipment, and insulation/air sealing measures that save electricity used for cooling and natural gas used for heating. This approach provides accuracy beyond the level achieved by many potential studies, which consider the fuels separately. Failing to account for measure interaction has a significant impact on the accuracy of potential study results.

METHODOLOGY

Energy Efficiency Potential Model

The Energy Center developed an Excel-based model to conduct cost-effectiveness screening and develop energy efficiency potential estimates. This straightforward analytic tool was used to evaluate over 500 unique energy efficiency and demand response measures across three sectors: residential, commercial, and industrial. A list of global modeling assumptions is provided in Appendix A.

Key inputs in the energy efficiency potential model include: base energy consumption, disaggregated by market segment and end use; market saturation for standard efficiency equipment and energy efficient equipment; a technical feasibility factor;[4] primary fuel savings; demand reduction for electricity-saving measures; secondary fuel impacts caused by measure interactions;[5] measure costs (including incremental equipment costs, installation costs, and annual operations and maintenance costs); and measure lifetimes,

[4] The technical feasibility factor was only used in estimating technical and economic potential. Estimates of achievable potential used an "achievable factor" which incorporates the effect of three key factors: (1) technical/engineering convertibility; (2) the share of the market that is not yet energy efficient (sometimes referred to as a "remaining factor"); and (3) the degree of influence an energy efficiency program is expected to have on market penetration of the technology.

[5] As noted above, the primary measure interactive effects considered in the analysis are associated with fuel switching, heating penalties and cooling benefits achieved through installation of energy efficient lighting, and insulation/air sealing measures that save electricity used for cooling and natural gas used for heating.

both for the energy efficient technology and the standard efficiency equipment it is replacing. Each technology is also assigned an "achievable factor," which quantifies the expected impact an energy efficiency program could have on the market penetration of that technology in a given year. This achievable factor is broader than the achievable factor definition typically used in potential studies. Here it accounts for convertibility (the technical/engineering feasibility of converting equipment to a more energy efficient alternative) and the amount of equipment that has not already been converted to a more energy efficient technology (sometimes referred to as a "remaining factor"), in addition to accounting for a program's ability to influence market penetration of the technology. (For additional information on the Energy Center's approach for developing achievable factors, see the "Survey of Experts" section below).

There are two primary analytical approaches to modeling energy efficiency potential: bottom-up and top-down. The bottom-up approach begins at the measure level, multiplying the costs and savings associated with deploying each energy efficient measure by the number of units of each measure expected to be installed during the study period, and aggregating the results. The top-down approach begins with a forecast of energy sales over the study period, and disaggregates this forecast within each sector by market segment and end use. Each energy efficient technology reduces the base forecast by a certain percentage, and the difference between the base forecast and the efficiency forecast represents efficiency potential.[6] As end use energy consumption is relatively homogeneous within the residential sector, the Energy Center was able to use a bottom-up approach for the residential market. The commercial and industrial (C&I) sectors require a top-down approach, given the variability in energy end use and technology installations across market segments and facility types.

In estimating energy efficiency potential, the model uses electricity and natural gas sales data by sector, as reported in the U.S. Department of Energy's Energy Information Administration (EIA) reports 861 and 176. As the most recent available sales data were from 2006, energy efficiency potential estimates were scaled up to projected 2012 and 2018 sales levels using sector-specific annual sales growth rates by fuel.[7] Annual sales growth rates by fuel and by sector are listed in Appendix A, *Global Modeling Assumptions*.

This analysis focused on developing estimates of annual energy efficiency potential for 2012 and 2018. These years were selected as general reference points to represent shorter-term and longer-term planning horizons, rather than definitive deadlines. We also developed rough estimates of cumulative energy savings through 2018. Cumulative potential estimates were developed by aggregating estimated annual savings through 2018, based on an assumed ramp-in from current energy efficiency program savings levels through projected annual savings levels in 2012 and 2018. IAMU provided data for each participating utility, showing annual electricity and/or natural gas savings resulting from energy efficiency programs in 2006.[8] Annual savings were ramped up from 2006 levels to projected 2012 and

[6] National Action Plan for Energy Efficiency (2007). *Guide for Conducting Energy Efficiency Potential Studies*. Prepared by Mosenthal and Jeffrey Loiter, Optimal Energy, Inc. Available at: www.epa.gov/eeactionplan.
[7] As sales forecasts for IAMU member utilities were not available, we used average annual sales growth rates by sector and by fuel as forecast by Iowa investor-owned utilities (IOUs). These sales forecasts are reported in: Quantec (2008). *Assessment of Energy and Capacity Savings Potential in Iowa*. Prepared for the Iowa Utility Association in collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group.
[8] In 2006, IAMU members reported average electric and natural gas savings of 0.2 percent of baseline sales. For the most part, reported savings results were not derived through an independent third party evaluation, so the Energy Center applied an assumed net-to-gross (NTG) ratio of 0.7, resulting in estimated net savings of 0.14 percent of

2018 levels using by assuming a constant annual growth rate from 2006 through 2012, and from 2012 through 2018.

As previously noted, the model accounts for the effects of measure interaction, where installation of an energy efficiency measure affects multiple energy end uses. In some cases, measure interaction also affects multiple fuels. For example, installation of a programmable thermostat saves electricity used for cooling and natural gas used for heating. However, the IAMU members participating in this study include single fuel utilities (providing either electric or natural gas service) as well as dual fuel utilities (providing electric and natural gas service). For that reason, secondary fuel effects have been subtracted from overall potential if they occur within the service territory of single-fuel utility. In the case of the programmable thermostat example described above, natural gas potential estimates are reduced to account for savings that would occur in areas where an IAMU member does not provide natural gas service.

Cost-Effectiveness Screening

Cost-effectiveness screening was conducted using the Total Resource Cost (TRC) test, which compares the net present value of benefits achieved over the lifetime of the measure with the costs incurred by the program and the participant.[9] Measures with a benefit/cost ratio of 1.0 or greater pass the TRC test and are cost-effective.

For the purposes of this analysis, quantified benefits include the avoided cost of conserved energy and an externality factor that accounts for the additional societal benefits associated with avoided energy consumption and demand reduction.[10] The benefits of secondary fuel savings are also included in the TRC, since these savings are realized at the customer level, regardless of whether the utility is single fuel or dual fuel.

Costs include all expenses associated with measure installation, including equipment and labor costs, as well as program administrative costs. Since incentives are essentially a transfer payment from program to participant, they represent a portion of the measure cost and are not disaggregated for the purposes of the TRC test.

Survey of Experts

The Energy Center used two key data sources in developing achievable factors for the energy efficiency measures addressed in this study: a survey of Wisconsin energy efficiency experts (with results modified for Iowa-specific attributes), and IAMU member surveys.

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electricity and natural gas sales, respectively, for 2006. The assumed NTG ratio is consistent with portfolio-level NTG ratios achieved by programs in other states.

[9] The societal test referenced in Iowa Administrative Code (199 IAC 25) is typically described as a variation of the TRC test. The key difference is that the societal test includes externality effects (avoided pollution, etc.), while the TRC typically does not. However, the version of the TRC test used in this analysis includes the externality factors specified in Iowa Administrative Code, so it approaches the societal test quite closely. Detailed information on economic screening methodology is available in the California Standard Practice Manual, available at: http://drrc.lbl.gov/pubs/CA-SPManual-7-02.pdf.

[10] The Energy Center used externality factors specified in the *Iowa Administrative Code* (Sec. 199—35.9(476) and 199—35.10(476)): a 10% adder for electricity, and a 7.5% adder for natural gas.

In the fall of 2008, the Energy Center surveyed more than 30 Wisconsin-based energy efficiency experts to obtain their estimates of future market penetration for a range of energy efficient technologies. Participants were asked to specify the level of market penetration that could be achieved through moderate and aggressive energy efficiency program efforts, as compared with a "no program" scenario. This survey provided a rich source of data on expected future trends for a wide array of energy efficient technologies. Supporting the application of Wisconsin survey data to the Iowa study, the two states have many similarities in terms of climate, demographics, and energy efficient technology markets. At the same time, there are important differences in terms of specific technology markets—for example, ground source heat pumps are more prevalent in Iowa, and there is wider use of central air conditioning. In addition, the energy efficiency program landscape is different. In Wisconsin, statewide energy efficiency programs have been in place since 2000, while IAMU members have varying degrees of experience with program implementation. In addition, assessing efficiency potential for a geographically dispersed group of municipal utilities requires a different approach than assessing statewide potential.

For these reasons, it was important to obtain IAMU member input on what they expect energy efficiency programs can achieve in their communities. One survey, sent to all IAMU members participating in the study, solicited member input on reasonable levels of program expenditures and energy savings for their service territory, and asked them to identify barriers to promoting greater levels of energy efficiency in their community. We also developed a targeted survey that was sent to 16 municipal utilities with existing energy efficiency programs to obtain their input on expected market penetrations for key technologies in 2012, based on a comparison with Wisconsin survey results. Survey instruments are provided in Appendix G.

The Energy Center used results from these surveys, as well as information on typical results achieved by best practice energy efficiency programs, to develop the achievable factors used in the IAMU potential study. Achievable factors were developed for 2012 and 2018. As some IAMU members do not have energy efficiency programs in place or are in the early stages of program planning, the 2012 achievable factors are based on an expectation of what could be achieved under a moderate level of program effort, and the 2018 achievable factors are based on an expectation of what could be achieved under an aggressive level of program effort.

It is important to note that a number of IAMU members already have well-established and successful energy efficiency programs in place. These utilities could be able to achieve the aggressive levels of energy efficiency projected for 2018 sooner than those utilities that do not yet have programs in place.

Allocation of Potential and Program Costs to IAMU Member Service Territory

The Energy Center conducted a high-level allocation of achievable energy efficiency potential and program costs to individual IAMU member service territories using utility-specific data on base energy sales by sector (residential, commercial, and industrial). EIA reports 861 and 176 were used to determine electricity and natural gas sales by sector for each utility participating in the study. Energy efficiency potential was allocated to individual utilities by multiplying total savings potential across all participating utilities by each utility's individual share of aggregate sales. Potential was further disaggregated by sector, based on each utility's relative share of residential, commercial, and industrial sales. A similar approach was used to estimate sector-level shares of energy efficiency program expenditures for each utility. This allocation process was conducted for the 2012 achievable potential and program cost estimates only. Allocation estimates are presented in Appendix F.

Sensitivity Analysis

As discussed above, the base analysis includes an externality factor to account for the additional societal benefits associated with avoided energy consumption and demand reduction—a 10 percent increase to avoided costs for electricity, and a 7.5 percent increase to avoided costs for natural gas. However, these externality costs are low compared with potential costs associated with carbon emissions, should federal legislation regulating carbon emissions be enacted. Therefore, we conducted a sensitivity analysis to estimate energy efficiency and demand reduction potential under a carbon cost scenario. We relied on the 2008 levelized carbon cost estimate reported by Synapse Energy Economics under its medium-range forecast, which equates to $30 per ton of CO_2 emitted.[11] Using Iowa emissions factors,[12] this carbon price equates to $0.0235/kWh and $0.18/therm, on top of base avoided costs. This carbon price is between three and seven times higher than the base analysis externality factor for electricity, and over two times higher than the base analysis externality factor for natural gas. (See Appendix A for a summary of avoided costs, externality factors, and carbon prices used in this analysis).

Supplementary Analyses

In addition to the primary analysis of energy efficiency and demand response potential which relied on the Excel-based model discussed above, the Energy Center conducted three supplementary analyses: (1) an assessment of demand reduction potential from dynamic energy pricing; (2) an assessment of energy efficiency opportunities resulting from improvements to utility distribution systems; and (3) descriptions of innovative energy efficiency program models that are well-suited for deployment in municipal utility service territories.

As depth pricing-based forecasting was beyond the scope of this study, we developed a first-order estimate of the demand reduction potential associated with dynamic pricing structures by applying general assumptions reported in the demand response section of the Iowa investor-owned utilities' (IOUs) 2008 potential study.[13] This approach was used to evaluate the demand reduction potential associated with time of use rates for residential customers, and critical peak pricing for residential and commercial customers.

To evaluate energy efficiency improvements on the utility distribution system, we considered two key opportunities: transformers and surge arrestors.[14] We conducted research into the potential savings associated with supply-side and demand-side transformers, and evaluated the effect that new federal standards for transformer efficiency are likely to have on energy savings potential. We conducted similar research and analysis for surge arrestors, a supply-side improvement opportunity.

Lastly, we conducted research on energy efficiency program best practices to identify a number of innovative program models that are well-suited for deployment in municipal utility service territory.

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[11] Synapse Energy Economics, Inc. (2008). *Synapse 2008 CO_2 Price Forecasts*.
[12] Center for Climate Strategies (2008). *Final Iowa Greenhouse Gas Inventory and Reference Case Projections 1990-2025*.
[13] Quantec (2008). *Assessment of Energy and Capacity Savings Potential in Iowa*. Prepared for the Iowa Utility Association in collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group.
[14] Cooper Power Systems provided information on distribution system energy efficiency opportunities which was integral to this analysis. For additional information, please visit: www.cooperpower.com.

RESULTS

ENERGY EFFICIENCY

Combined Resource Potential: Technical, Economic, and Achievable

As discussed above, technical potential assumes that all technologically feasible energy efficient technologies are deployed immediately, regardless of cost-effectiveness. The Energy Center estimates that the technical energy efficiency potential in IAMU member service territory is equivalent to 33 percent of baseline electricity consumption, 52 percent reduction of peak electricity demand, and 28 percent of natural gas consumption. Economic potential—which assumes immediate deployment of all cost-effective energy efficient technologies—is equivalent to 22 percent of baseline electricity consumption, 39 percent reduction of peak electricity demand, and 21 percent of natural gas consumption.

Achievable potential is the more meaningful metric for the purposes of establishing energy savings goals and energy efficiency program planning, as this estimate takes into account the myriad factors that affect adoption of energy efficiency measures, including cost-effectiveness, capital constraints, the useful lifetime of existing installed equipment, and program ramp-up time. The Energy Center developed achievable potential estimates for 2012 and 2018, estimating the annual energy savings that IAMU member programs could achieve in those years. In 2012, under moderate levels of energy efficiency program investment, achievable potential is equivalent to 1.1 percent of baseline electricity consumption, 1.2 percent of peak electricity demand, and 1.0 percent of natural gas consumption. In 2018, under aggressive levels of energy efficiency program investment, achievable potential is equivalent to 1.2 percent of baseline electricity consumption, 1.8 percent reduction of peak electricity demand, and 1.8 percent of natural gas consumption.

Figures 1 through 3 compare technical and economic potential with 2012 and 2018 annual achievable potential in IAMU member service territory for electric efficiency, peak demand reduction, and natural gas efficiency, respectively.

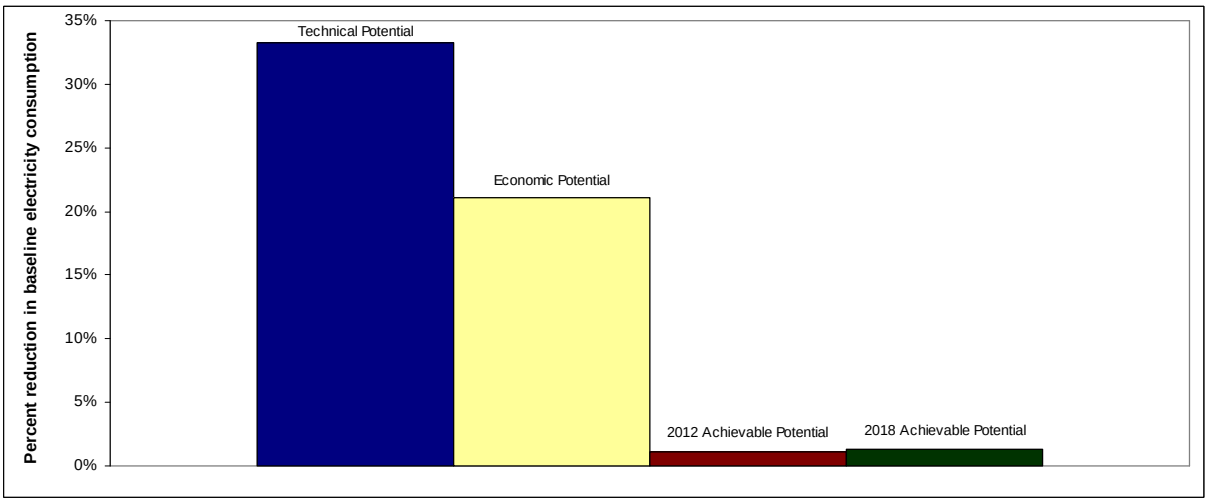

Figure 1: Comparison of Technical, Economic, and Achievable Potential for Electric Efficiency

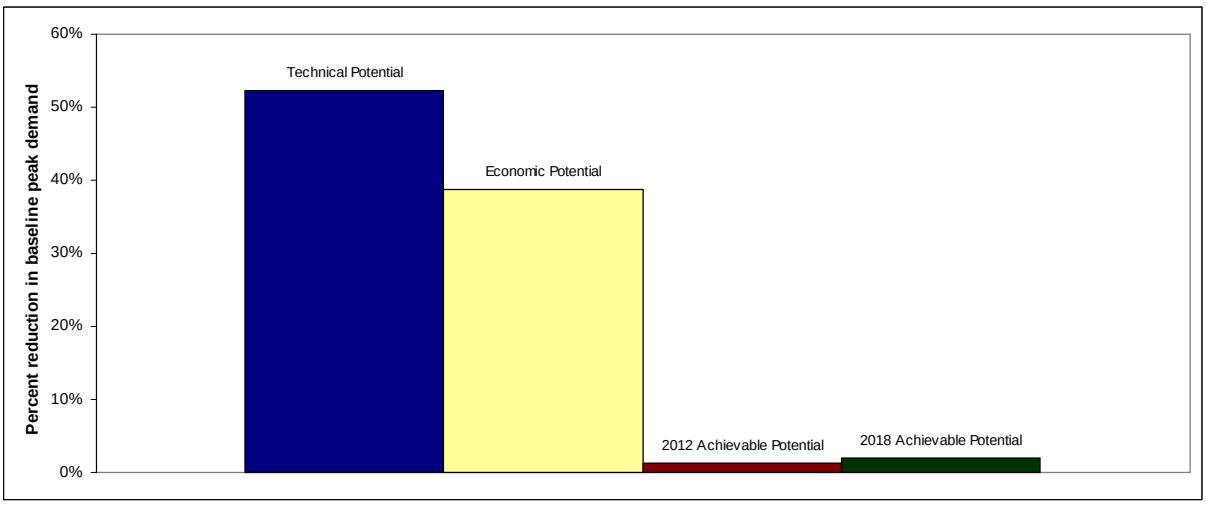

Figure 2: Comparison of Technical, Economic, and Achievable Potential for Peak Demand Reduction

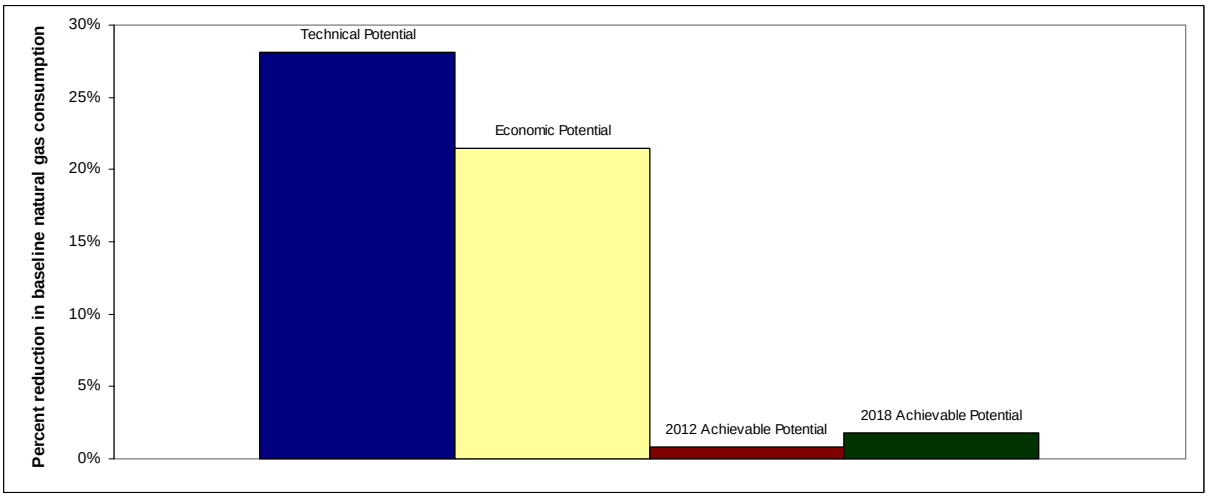

Figure 3: Comparison of Technical, Economic, and Achievable Potential for Natural Gas Efficiency

The annual achievable potential results presented above would produce a cumulative reduction in baseline electricity consumption of 4.3 percent by 2012 and 11 percent by 2018, and a cumulative reduction in baseline natural gas consumption of 4.1 percent by 2012 and 13 percent by 2018.[15] The cumulative energy savings potential trend is shown in Figure 4.

[15] As discussed previously, cumulative potential represents the aggregate savings from each year of annual savings as energy efficiency programs ramp up from current levels to 2012 levels of moderate investment, and 2018 levels of aggressive investment.

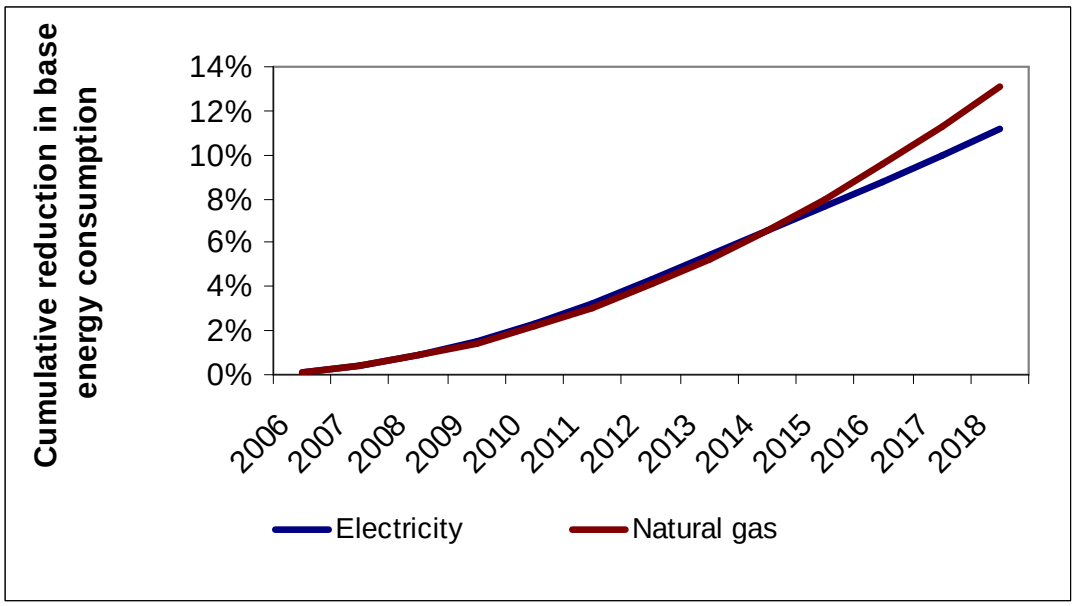

Figure 4: Cumulative Electricity and Natural Gas Achievable Potential through 2018

Costs and Benefits of Projected Energy Savings

The cost of achieving projected energy savings levels can be evaluated from a total resource cost perspective or from a program cost perspective. The total resource perspective considers the cost to consumers and businesses making the energy efficiency investments, as well as the cost of administering utility-funded energy efficiency programs. In the year 2012, the total resource cost of achieving projected levels of energy efficiency is $16 million. (Note that this estimate reflects the estimated costs incurred by programs and participants *in a single year*. If similar results were achieved the following year, an additional $16 million in costs would be incurred by program administrators and participants.)

The program perspective considers only those costs incurred by the utility—namely, incentives paid to program participants as well as the administrative costs associated with energy efficiency program delivery. (Administrative costs include all program costs *except* incentives: program planning and design costs, marketing costs, implementation costs, etc.) The Energy Center estimates that by 2012, annual energy efficiency program investments of between $9.4 million and $13 million would be necessary to achieve the results projected in this analysis.[16] Annual energy efficiency program investments would ramp up from current funding levels to achieve projected funding levels in 2012. To achieve similar results the following year, and additional $9.4 to $13 million program investment would be necessary.

Allocating estimated program costs by sector, approximately 52 percent of costs are for the residential market, approximately 33 percent are for the commercial market, and approximately 15 percent are for

[16] The low end of this range assumes that programs pay for 50 percent of the incremental cost of energy efficiency measures, and the high end assumes that programs pay for 75 percent of the incremental cost.

the industrial market. Allocating estimated program costs by fuel, approximately 70 percent are for measures that primarily save electricity, and approximately 30 percent are for measures that primarily save natural gas.

Achieving projected 2012 levels of energy efficiency would produce *aggregate net benefits* of $39 million. In other words, the lifecycle savings associated with energy efficiency measures installed in 2012 would exceed the total resource cost by $39 million. An equivalent investment in the following year would produce an additional $39 million in aggregate net benefits. Achieving projected 2012 levels of energy efficiency would reduce greenhouse gas emissions by 51,000 tons per year. Achieving projected 2018 levels of energy efficiency would reduce greenhouse gas emissions by 63,000 tons per year.

Energy Savings Potential by Sector

Figure 5 presents each sector's contribution to annual achievable efficiency potential in 2012. The residential sector represents approximately half of the electricity savings potential and half of the natural gas savings potential, while the commercial and industrial sectors represent approximately 56 percent of the demand reduction potential. Table 1 presents these data in percentage terms.

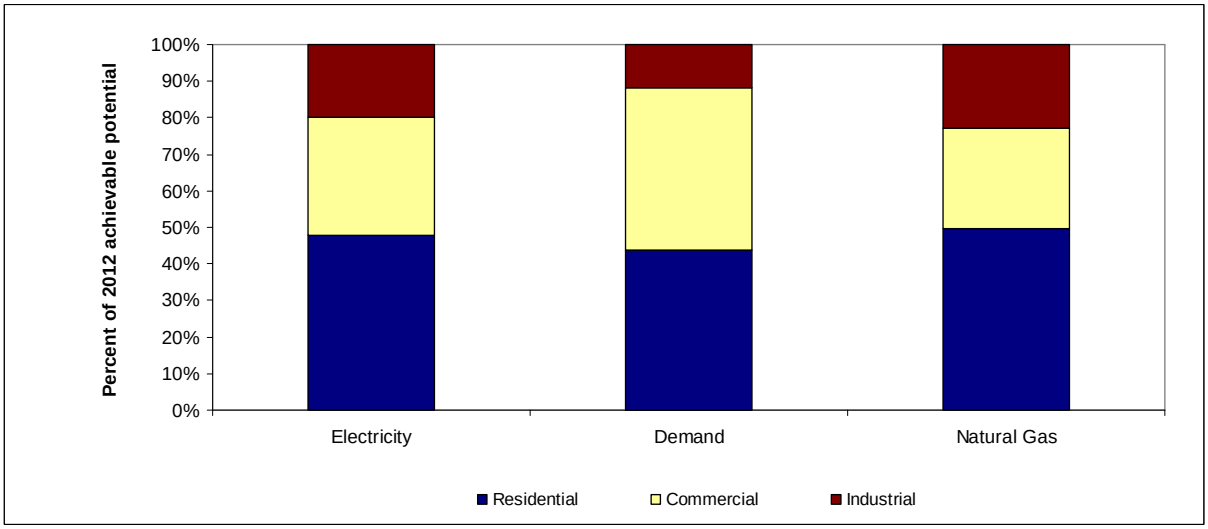

Figure 5: Sector Contributions to 2012 Achievable Potential

TABLE 1. SECTOR CONTRIBUTIONS TO 2012 ACHIEVABLE POTENTIAL

	Electricity Savings Potential (% of Total)	Demand Reduction Potential (% of Total)	Natural Gas Savings Potential (% of Total)
Residential	48%	44%	50%
Commercial	32%	45%	55%
Industrial	20%	12%	19%

Figures 6 and 7 present 2012 and 2018 annual achievable electricity and natural gas efficiency potential by sector, expressed as a percentage of baseline energy sales.

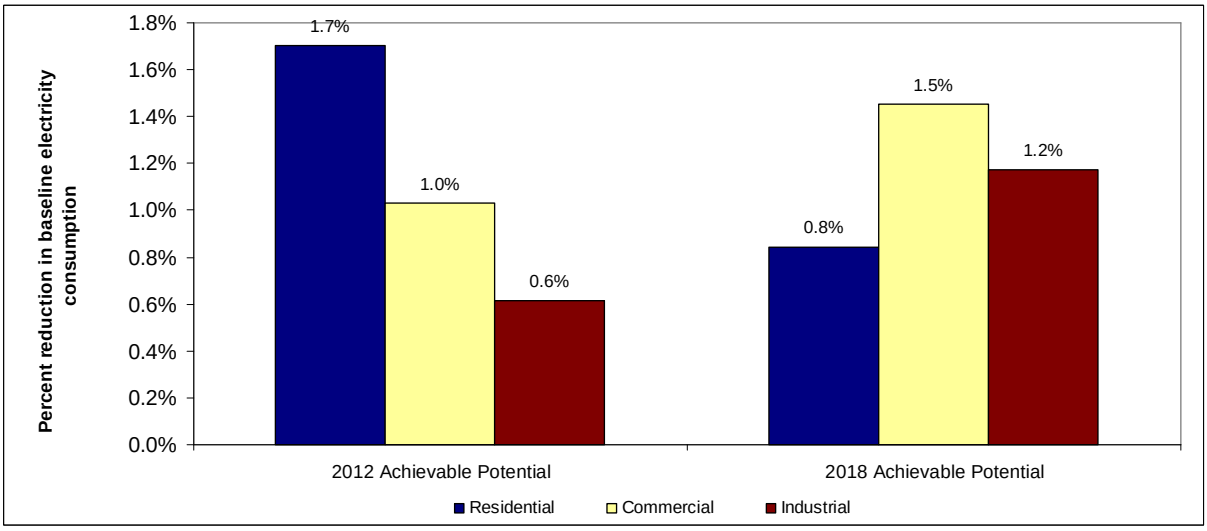

Figure 6: Achievable Electricity Savings Potential by Sector, Expressed as a Percentage of Baseline Sales

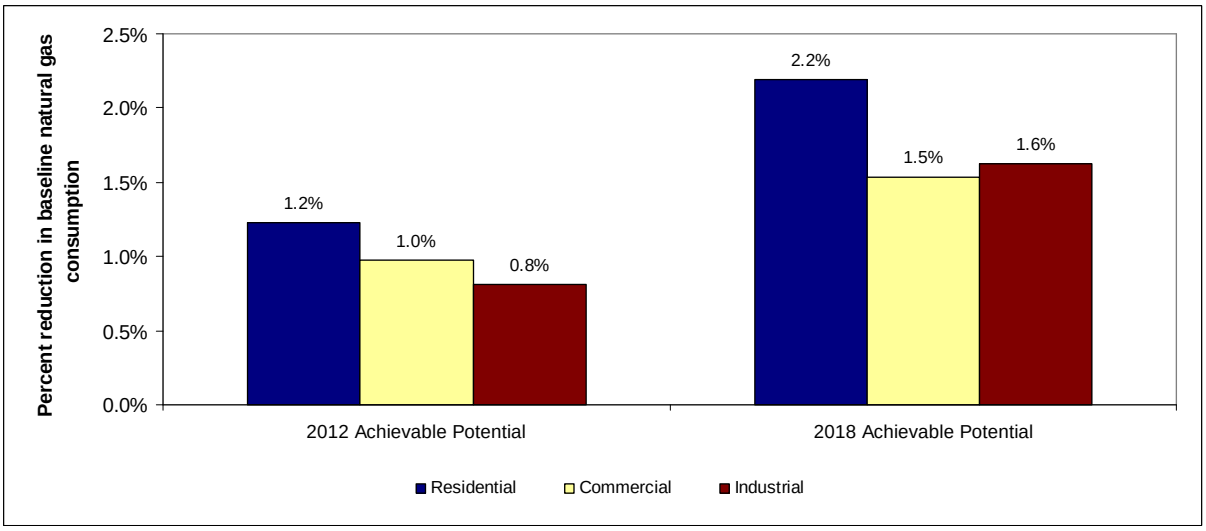

Figure 7: Achievable Natural Gas Savings Potential by Sector, Expressed as a Percentage of Baseline Sales

Figures 8 through 10 present annual achievable electricity savings, demand reduction, and natural gas savings potential in absolute terms. Table 2 presents a summary of sector results in table format.

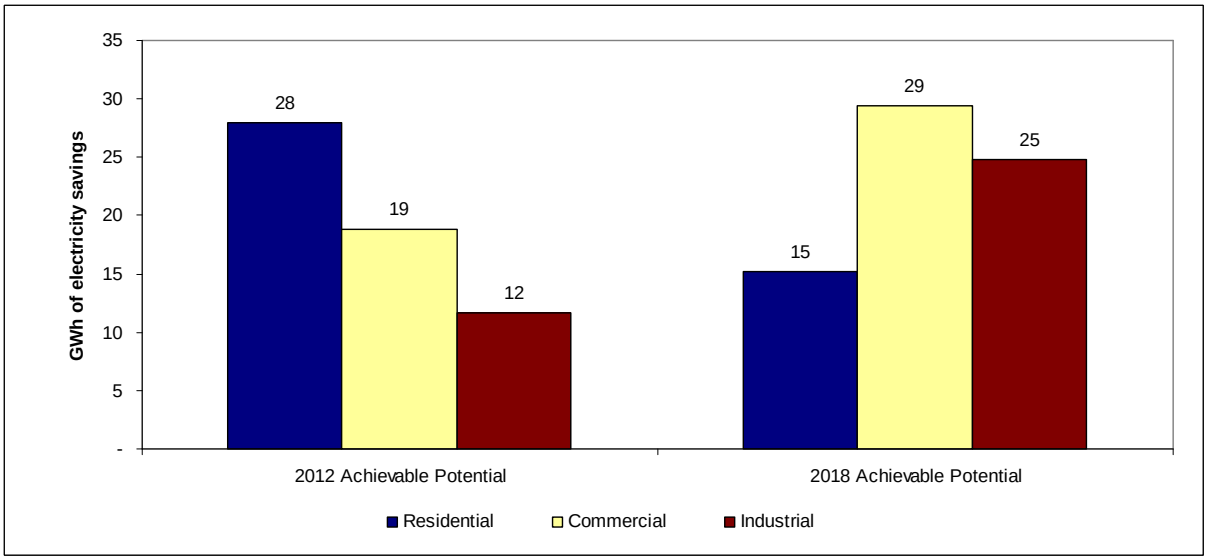

Figure 8: Achievable Electricity Savings Potential by Sector, 2012 and 2018

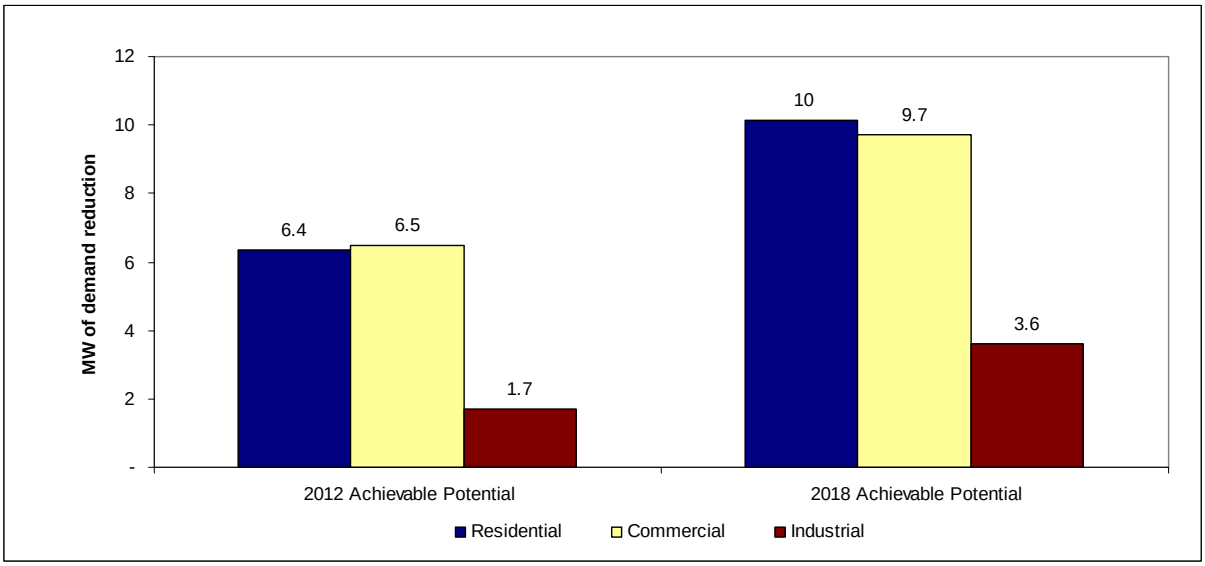

Figure 9: Achievable Demand Reduction Potential by Sector, 2012 and 2018

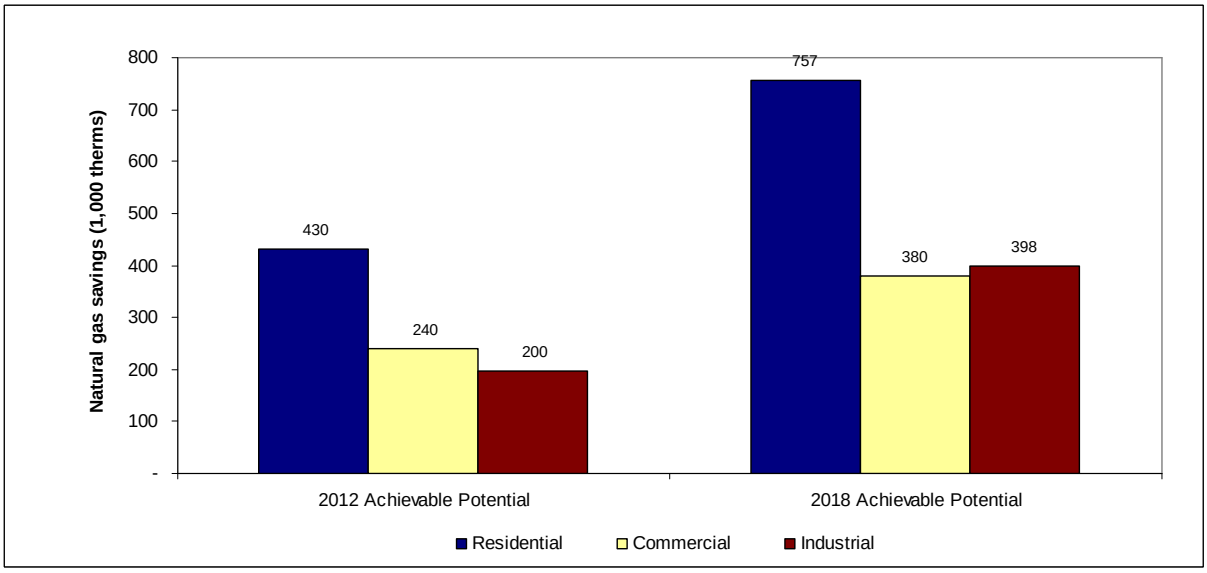

Figure 10: Achievable Natural Gas Savings Potential by Sector, 2012 and 2018

TABLE 2. 2012 AND 2018 ACHIEVABLE POTENTIAL BY SECTOR

	Electricity Savings Potential in 2012 (Annual GWh)		Demand Reduction Potential in 2012 (MW)		Natural Gas Savings Potential in 2012 (1000 therms)	
	2012	**2018**	**2012**	**2018**	**2012**	**2018**
Residential	28	15	6.4	10	430	760
Commercial	19	29	6.5	9.7	240	380
Industrial	12	25	1.7	3.6	200	400
TOTAL	**59**	**69**	**15**	**23**	**870**	**1,500**

Interpretation of Sector Results

There are several issues worth noting to aid interpretation of sector-level results. The data presented in the previous section show a substantial decrease in residential electricity savings potential from 2012 to 2018, and a substantial increase in natural gas savings potential. These trends are primarily the result of new federal efficiency standards for light bulbs which come into effect over the period.[17] Once high efficiency bulbs become mandated by law they are no longer within the purview of energy efficiency programs, and thus are no longer considered part of achievable potential (see the discussion of "naturally occurring efficiency in the *Methodology* section of this report). The estimated achievable potential for purchased replacement CFL bulbs in 2012 is approximately 22 GWh, but we project no savings for this technology in 2018. It is likely that emerging technologies such as LED lighting will develop to the point where they can begin to offset the effect that these new federal standards will have on residential lighting potential. However, given the uncertainties associated with the pace of technological development, it was not possible to account for such offsetting effects in this analysis.

The trend for residential natural gas potential is the flip side of the same coin, as there is a significant heating penalty associated with installation of energy-efficient lighting. More energy efficient bulbs give off less heat, causing a corresponding increase in natural gas consumption. The magnitude of this heating penalty is approximately 80,000 therms in 2012. With the phase-out of incandescent bulbs from 2012 to 2018 the magnitude of this interactive effect decreases, and we see the substantial increase in natural gas savings potential noted above.

[17] These standards were enacted through the Energy Independence and Security Act of 2007 (EISA). Between 2012 and 2014, the energy efficiency of residential general purpose light bulbs will need to be 25 to 30 percent better than today's incandescent bulbs. The phase-in starts with 100-Watt bulbs in 2012 and ends with 40-Watt bulbs in 2014. By 2020, residential general purpose light bulbs must be 60 more efficient than today's incandescents—a threshold that CFL bulbs already meet.

It is also important to discuss the sensitivity of residential natural gas savings estimates to input assumptions for a relatively small number of measures. Geothermal heat pumps and whole-home weatherization and direct install initiatives offer significant opportunities for natural gas savings in the residential sector. Yet relatively minor changes to input assumptions for these measures—within the reasonable range of uncertainty—produce significant changes in estimated savings potential.

Of the fuel switching measures evaluated in our model, geothermal heat pumps represent the largest savings opportunity—approximately 74 percent of residential natural gas savings potential.[18] Though our base analysis finds that geothermal heat pumps would be a cost-effective energy efficiency measure for natural gas utilities, the benefit/cost ratio is only slightly above 1.0. Conversely, weatherization of single family homes fell slightly below the cost-effectiveness screen (benefit/cost ratio of 0.81-0.92), though weatherization of multifamily rental housing (1-4 units) was found to be cost-effective (benefit/cost ratio of 1.01-1.04). Depending on local market conditions, a comprehensive weatherization/direct install program could represent an attractive energy savings opportunity for a natural gas utility.

Modifying input assumptions to include all applications of geothermal heat pumps and weatherization/direct install efforts leads to an increase in residential natural gas savings potential of 30 percent. Leaving both technologies out of the model decreases residential natural gas savings potential by 75 percent. Including all weatherization measures but excluding geothermal heat pumps reduces residential natural gas savings potential by 42 percent.

Energy Savings Potential by End Use

Figures 11 through 19 disaggregate 2012 sector energy efficiency potential by end use and by fuel type, showing which end use categories represent the largest (and smallest) components of energy efficiency potential for each sector and each fuel. Some sectors show negative savings potential within the “all other” category, which is the result of measure interactions wherein an electricity- or natural gas-saving measure causes a corresponding increase in consumption of the other fuel.

[18] Geothermal heat pumps represent a smaller, but still significant, energy savings opportunity in the commercial market: approximately 18 percent of natural gas savings potential.

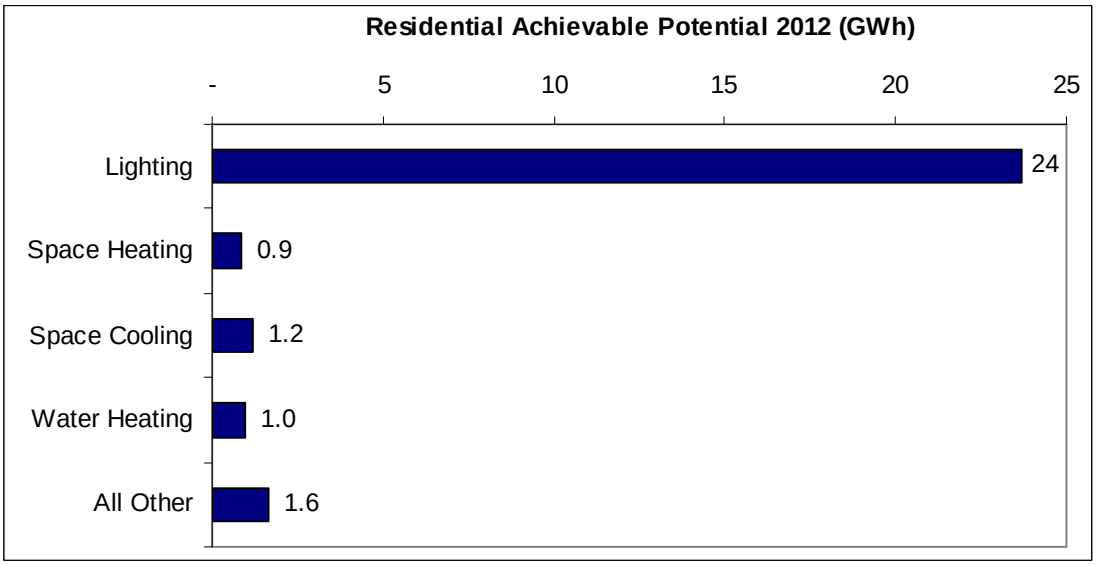

Figure 11: Achievable Residential Electric Efficiency Potential by End Use, 2012

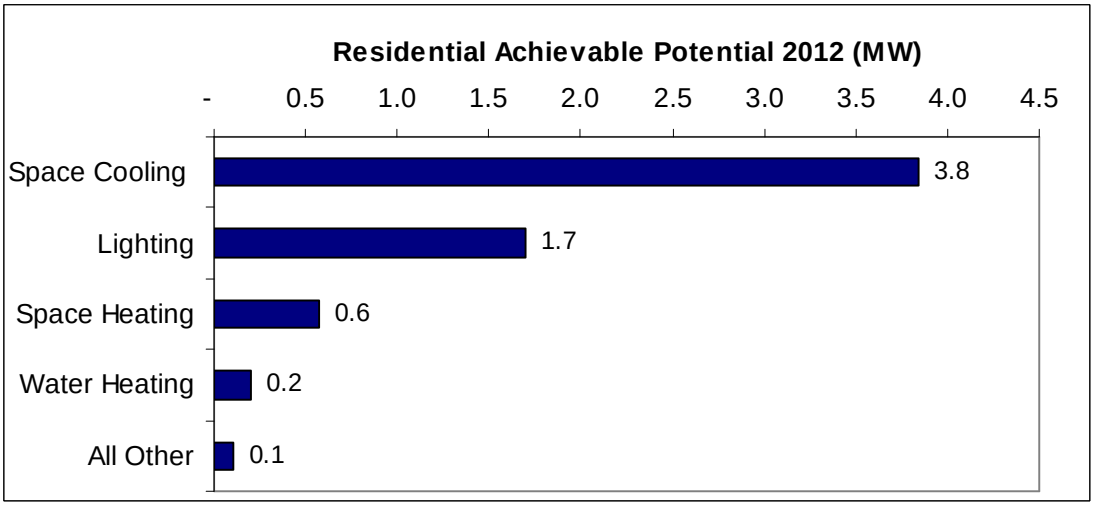

Figure 12: Achievable Residential Demand Reduction Potential by End Use, 2012

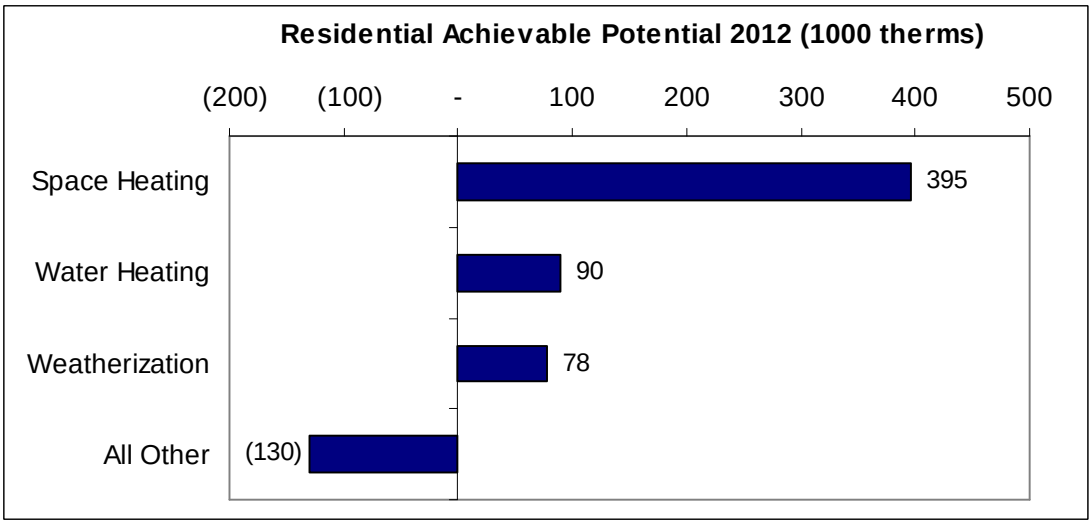

Figure 13: Achievable Residential Natural Gas Efficiency Potential by End Use, 2012[19]

In the residential sector, electricity-savings potential is dominated by lighting, where peak demand reduction potential is more evenly distributed across space cooling, lighting, and space heating measures (e.g., furnace motors). Space heating represents the largest opportunity for natural gas savings.

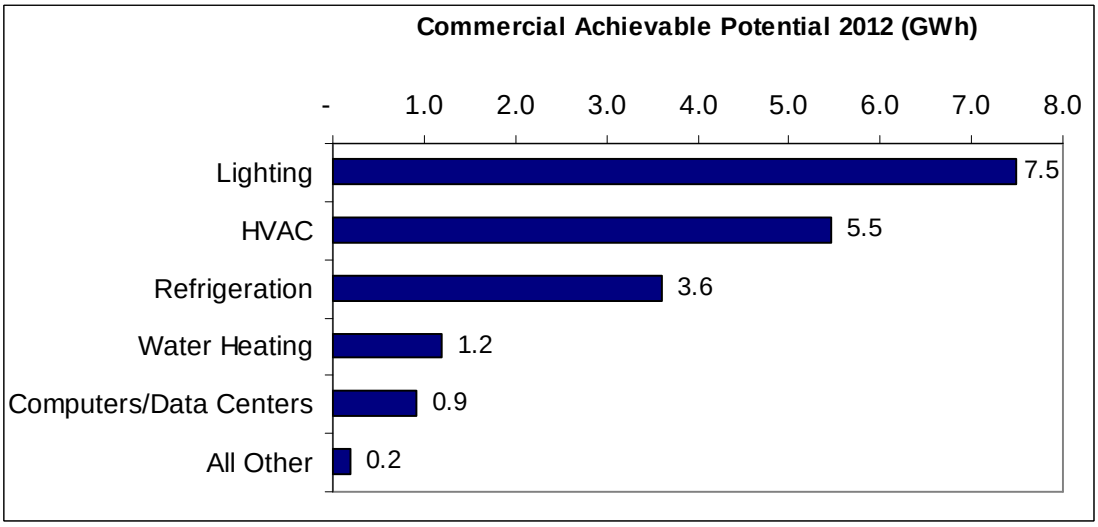

Figure 14: Achievable Commercial Electric Efficiency Potential by End Use, 2012

[19] Negative potential in the "all other" category for residential natural gas consumption is primarily due to heating penalties associated with installation of energy efficient lighting.

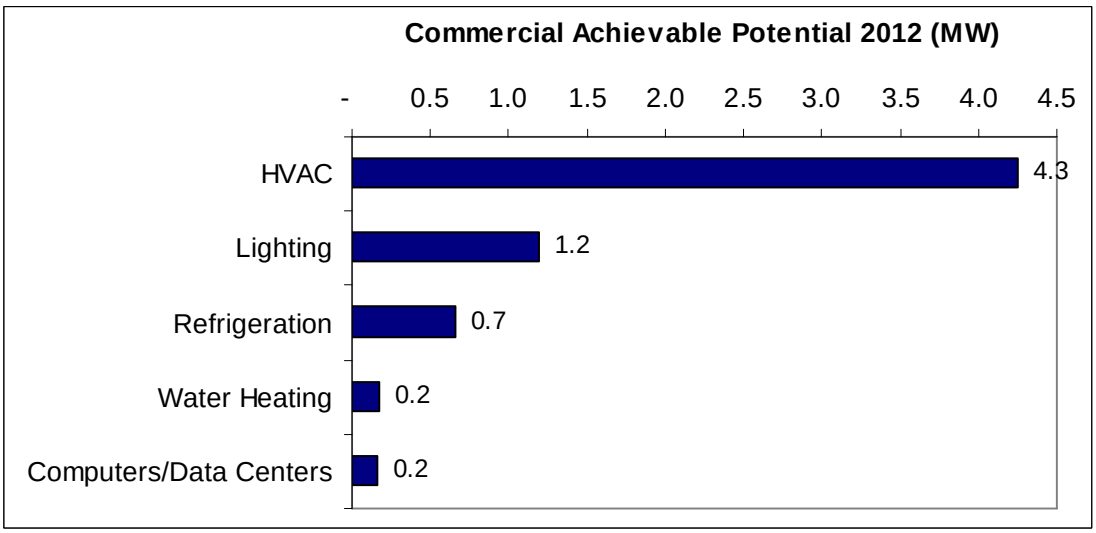

Figure 15: Achievable Commercial Demand Reduction Potential by End Use, 2012

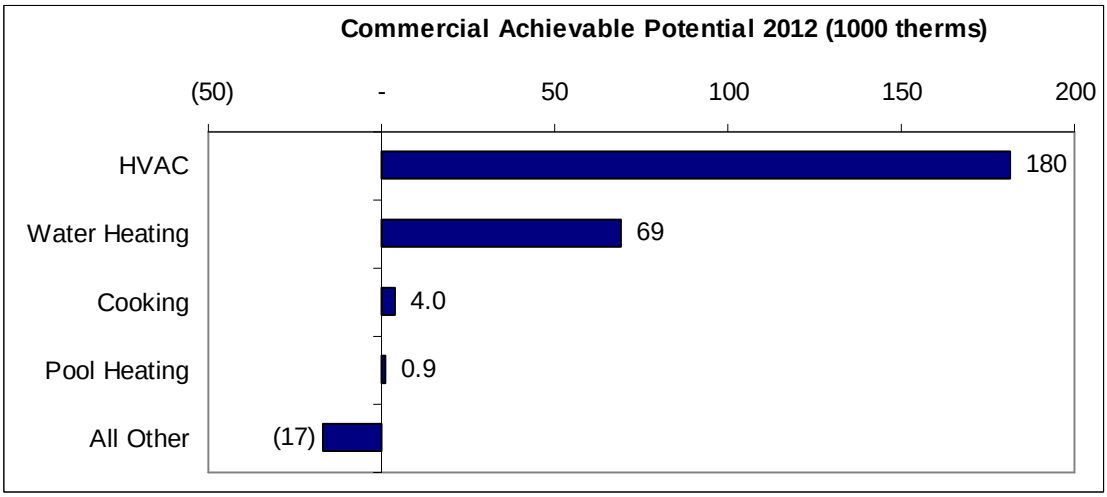

Figure 16: Achievable Commercial Natural Gas Efficiency Potential by End Use, 2012[20]

In the commercial market, lighting, refrigeration, and heating, ventilation, and air conditioning (HVAC), represent the major opportunities for electricity savings and peak demand reduction, while heating and water heating dominate natural gas savings potential.

[20] Negative potential in the "all other" category for commercial natural gas consumption is primarily due to heating penalties associated with installation of energy efficient lighting and computer equipment.

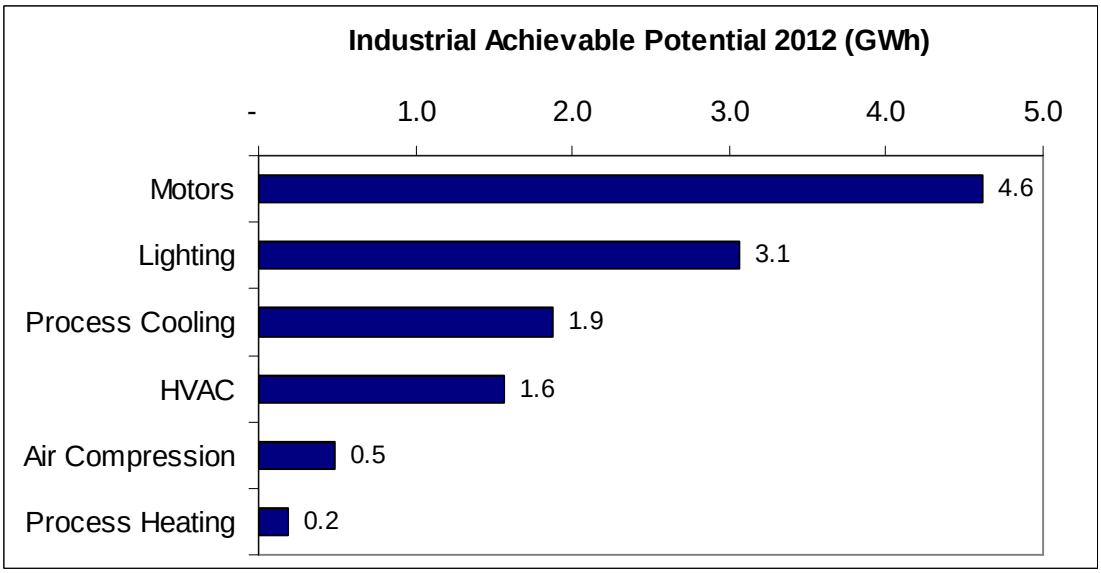

Figure 17: Achievable Industrial Electric Efficiency Potential by End Use, 2012

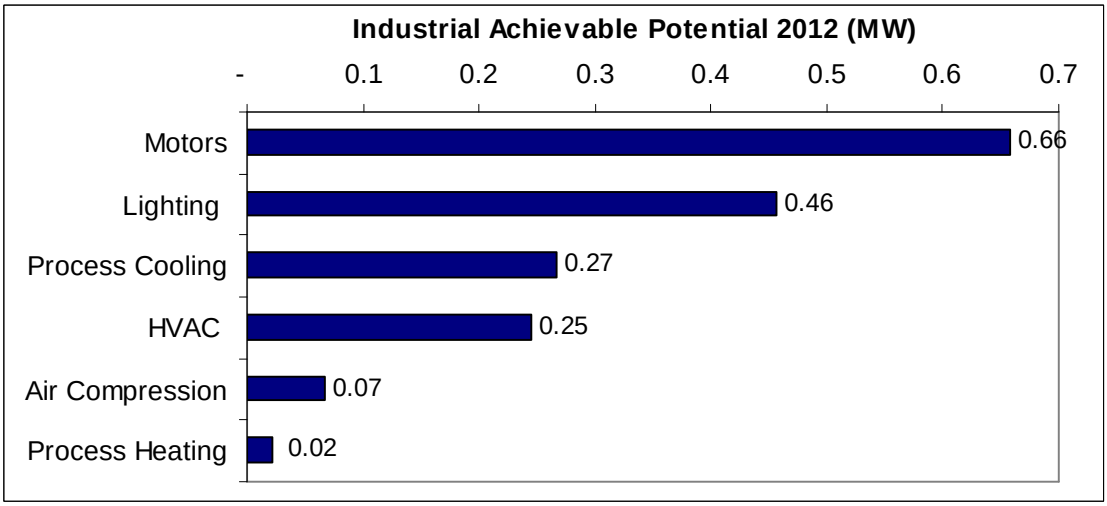

Figure 18: Achievable Industrial Demand Reduction Potential by End Use, 2012

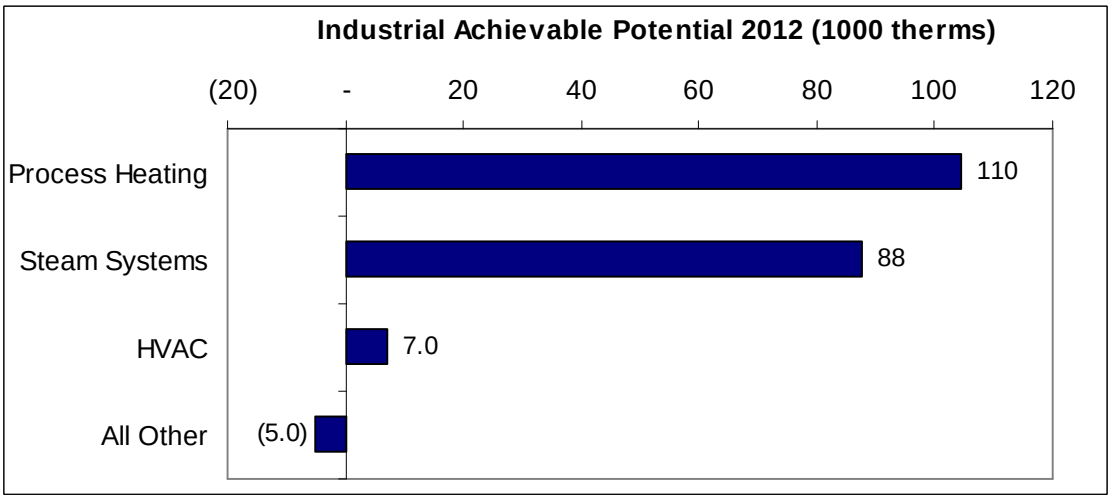

Figure 19: Achievable Industrial Natural Gas Efficiency Potential by End Use, 2012[21]

In the industrial sector, lighting and motors represent the major opportunities for electricity savings and peak demand reduction, while process heating and steam systems dominate natural gas savings potential.

Figures 20 through 28 show the largest energy-saving technology markets by sector. A definition of the measures included in each technology market is provided in Appendix B.

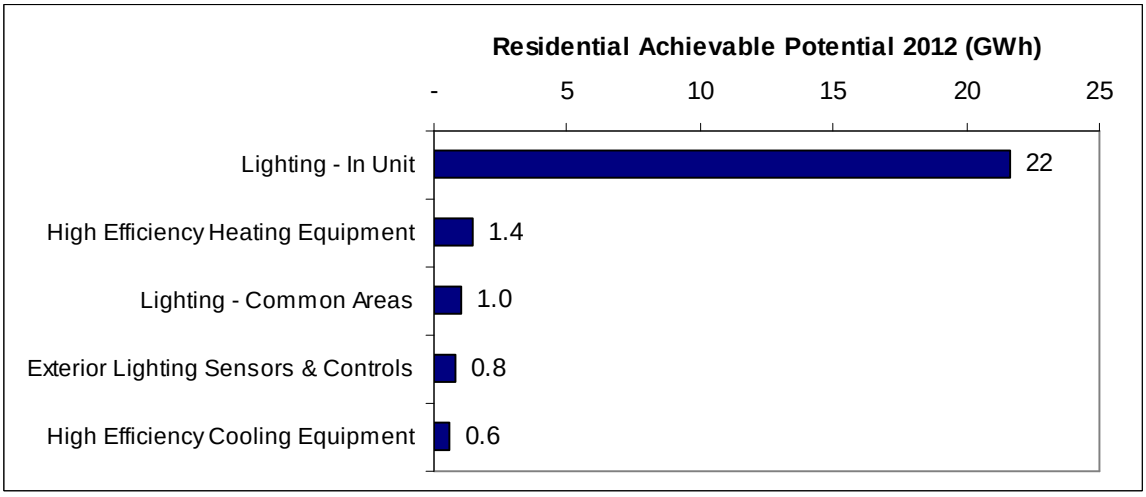

Figure 20: Top Residential Technology Markets: Electric Efficiency

[21] Negative potential in the "all other" category for industrial natural gas consumption is due to heating penalties associated with installation of energy efficient lighting and motors.

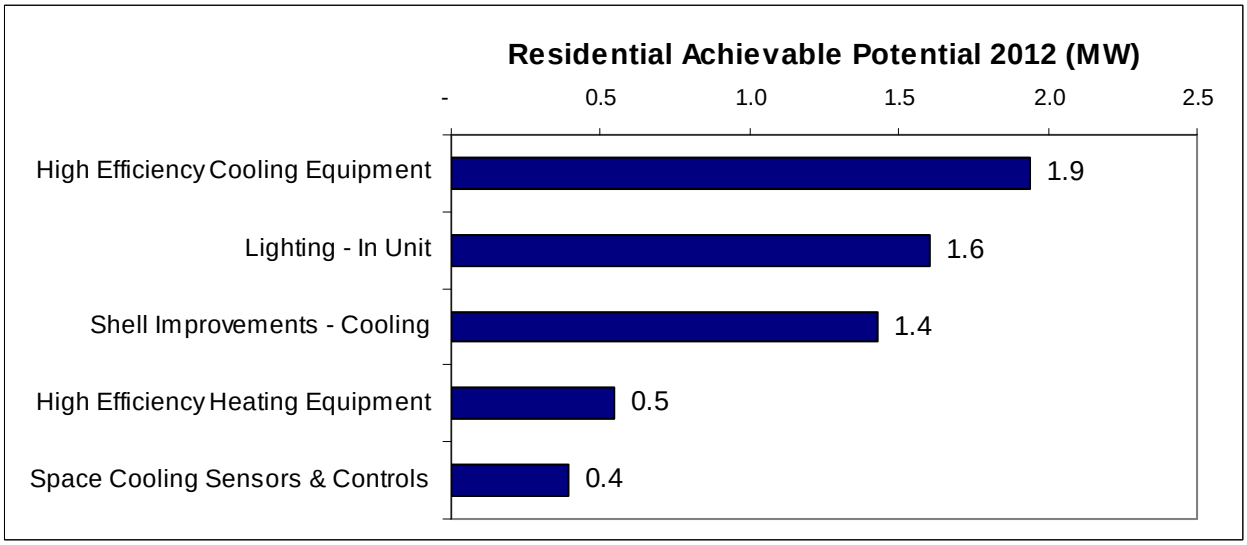

Figure 21: Top Residential Technology Markets: Electric Demand Reduction

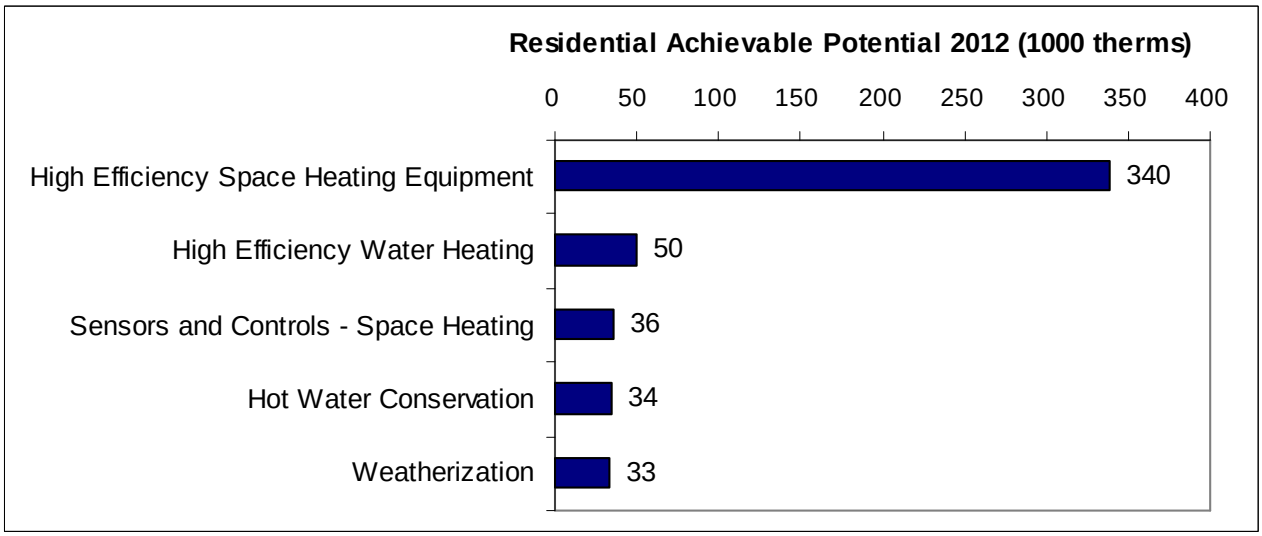

Figure 22: Top Residential Technology Markets: Natural Gas Efficiency

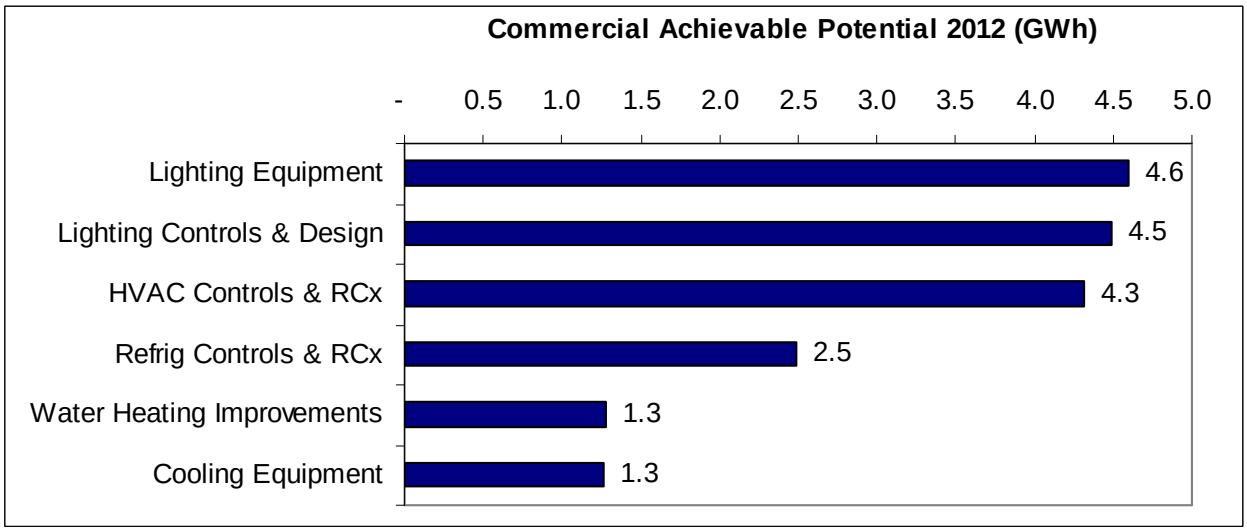

Figure 23: Top Commercial Technology Markets: Electric Efficiency

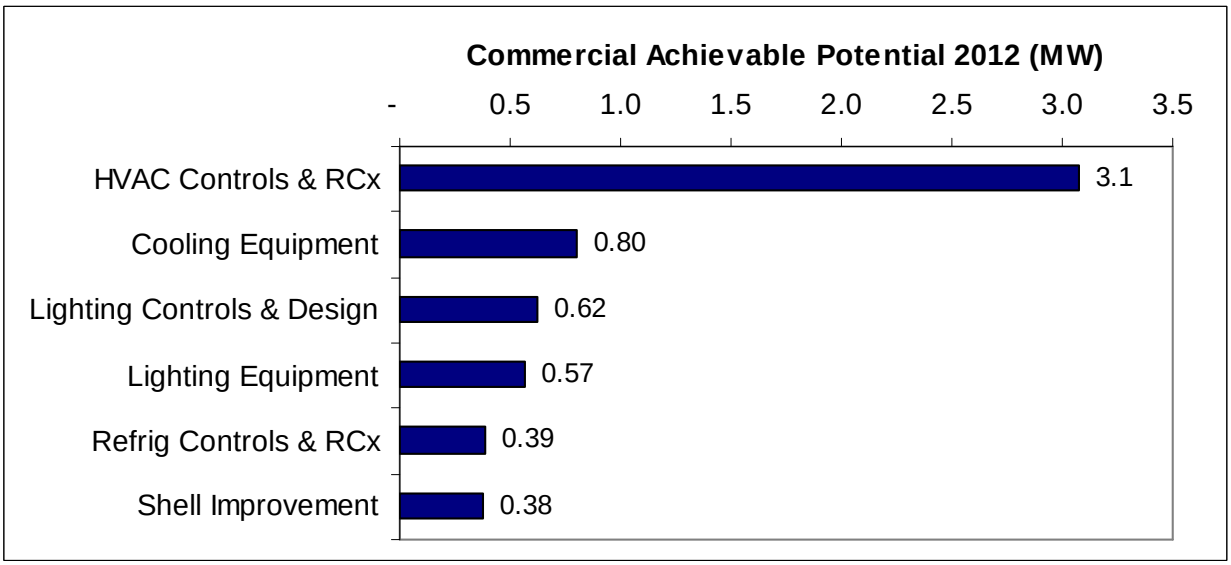

Figure 24: Top Commercial Technology Markets: Electric Demand Reduction

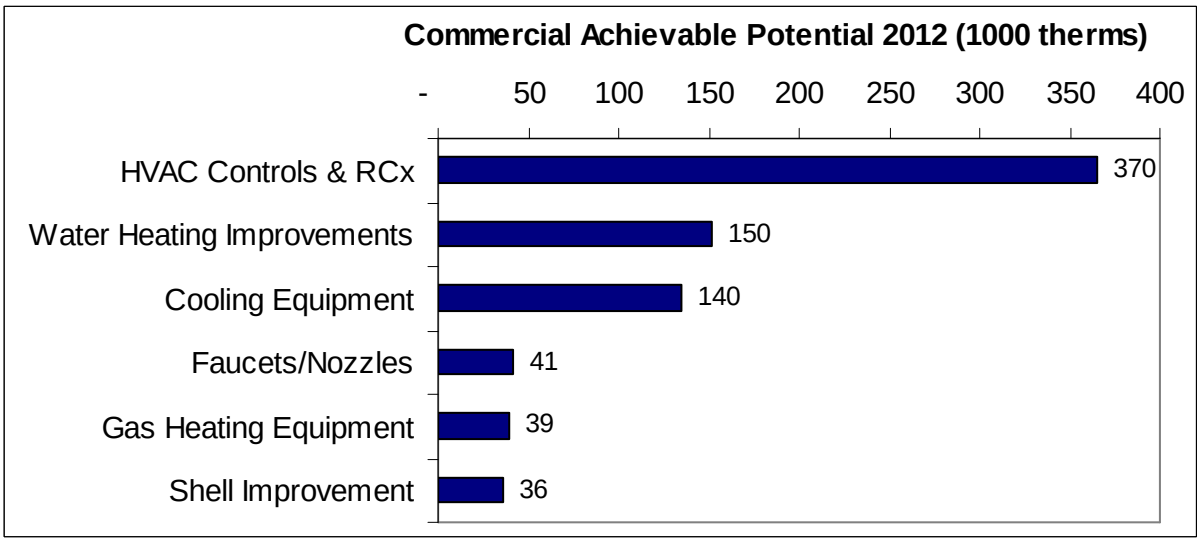

Figure 25: Top Commercial Technology Markets: Natural Gas Efficiency

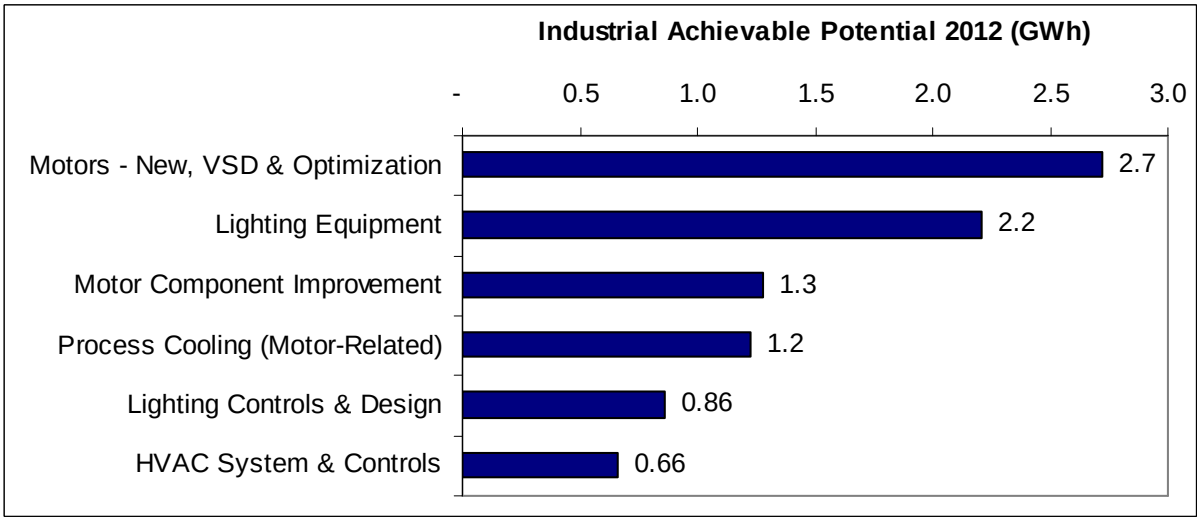

Figure 26: Top Industrial Technology Markets: Electric Efficiency

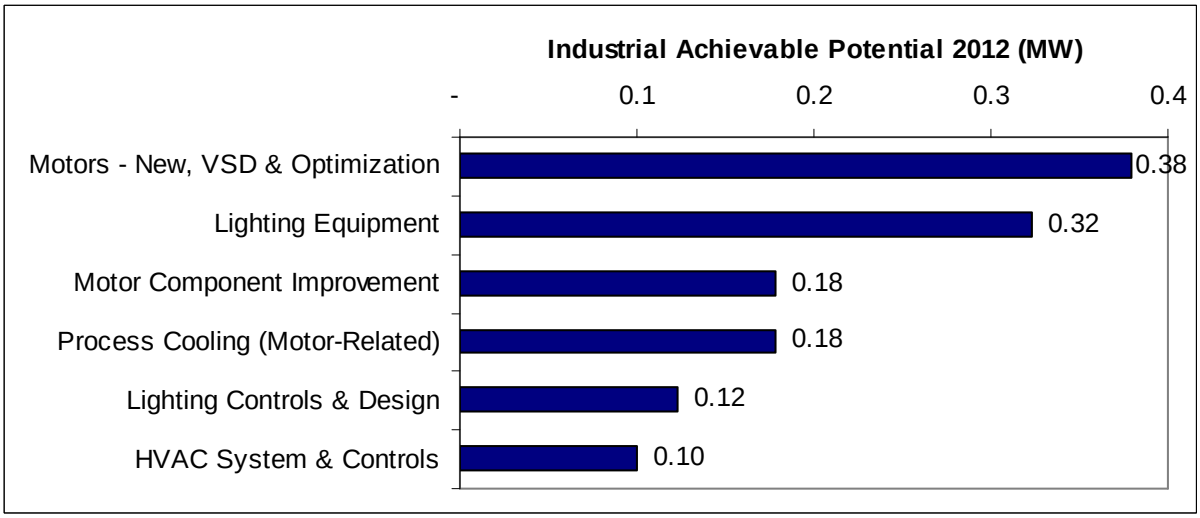

Figure 27: Top Industrial Technology Markets: Electric Demand Reduction

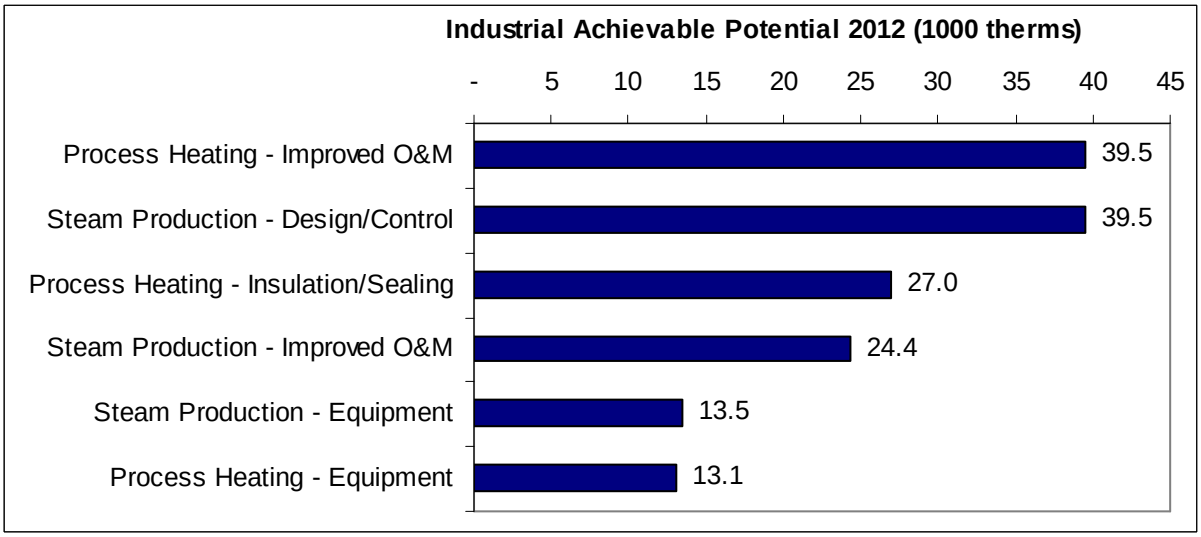

Figure 28: Top Industrial Technology Markets: Natural Gas Efficiency

Energy Savings Potential in Key Segments of the Commercial Market

Given the diverse array of facility types within the commercial sector, we provide additional details on energy-saving opportunities for key segments of the commercial market. Figures 29 and 30 compare electricity savings potential and natural gas savings potential by commercial market segment. Appendix E includes detailed data tables showing energy savings potential within commercial market segments.

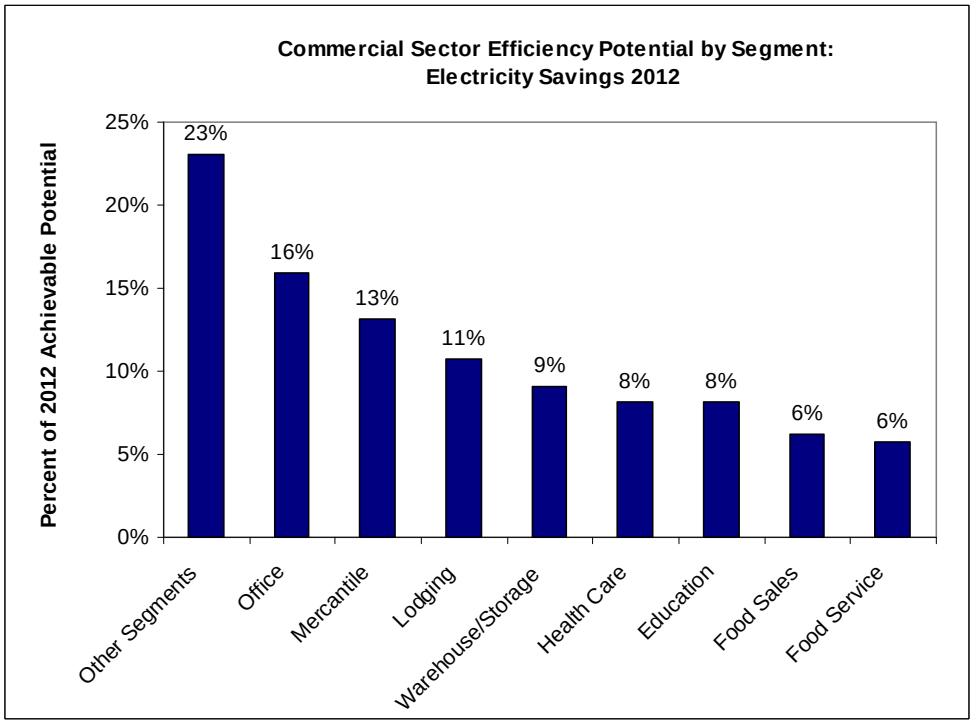

Figure 29: Top Commercial Market Segments: Electric Savings Potential

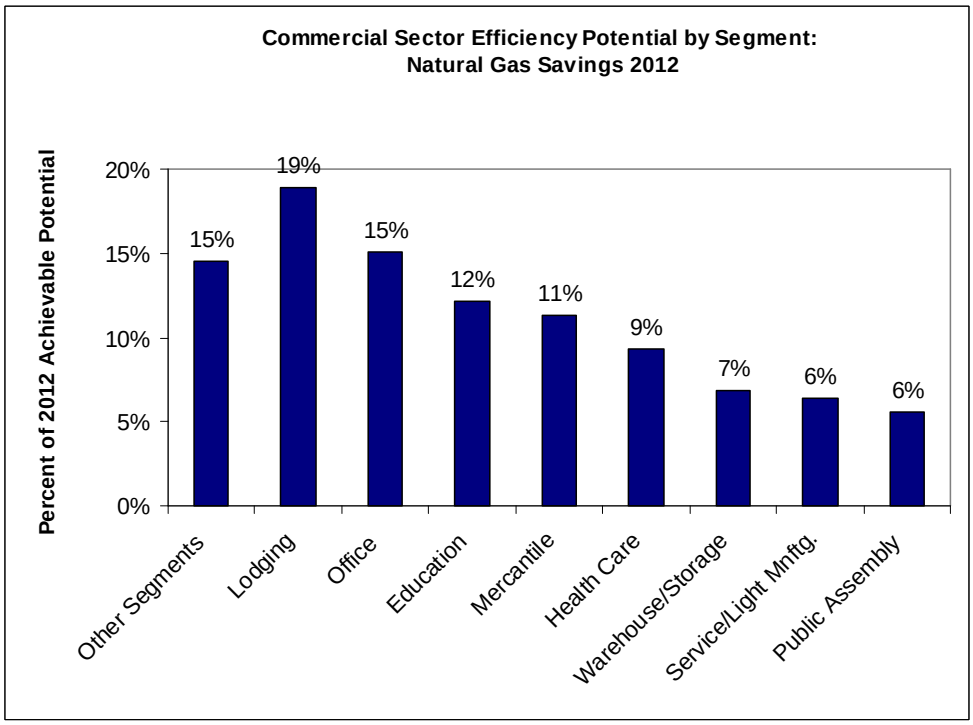

Figure 30: Top Commercial Market Segments: Natural Gas Savings Potential

As shown in the above figures, the largest areas of electricity savings potential are within office buildings (16 percent of commercial sector savings potential), mercantile/retail establishments (13 percent of potential), and lodging facilities (11 percent of potential). The largest areas of natural gas savings potential are within lodging facilities (19 percent of commercial sector savings potential), office buildings (15 percent of potential), and educational facilities (12 percent of potential).

Figure 31 compares the top electricity-saving technologies by commercial market segment.

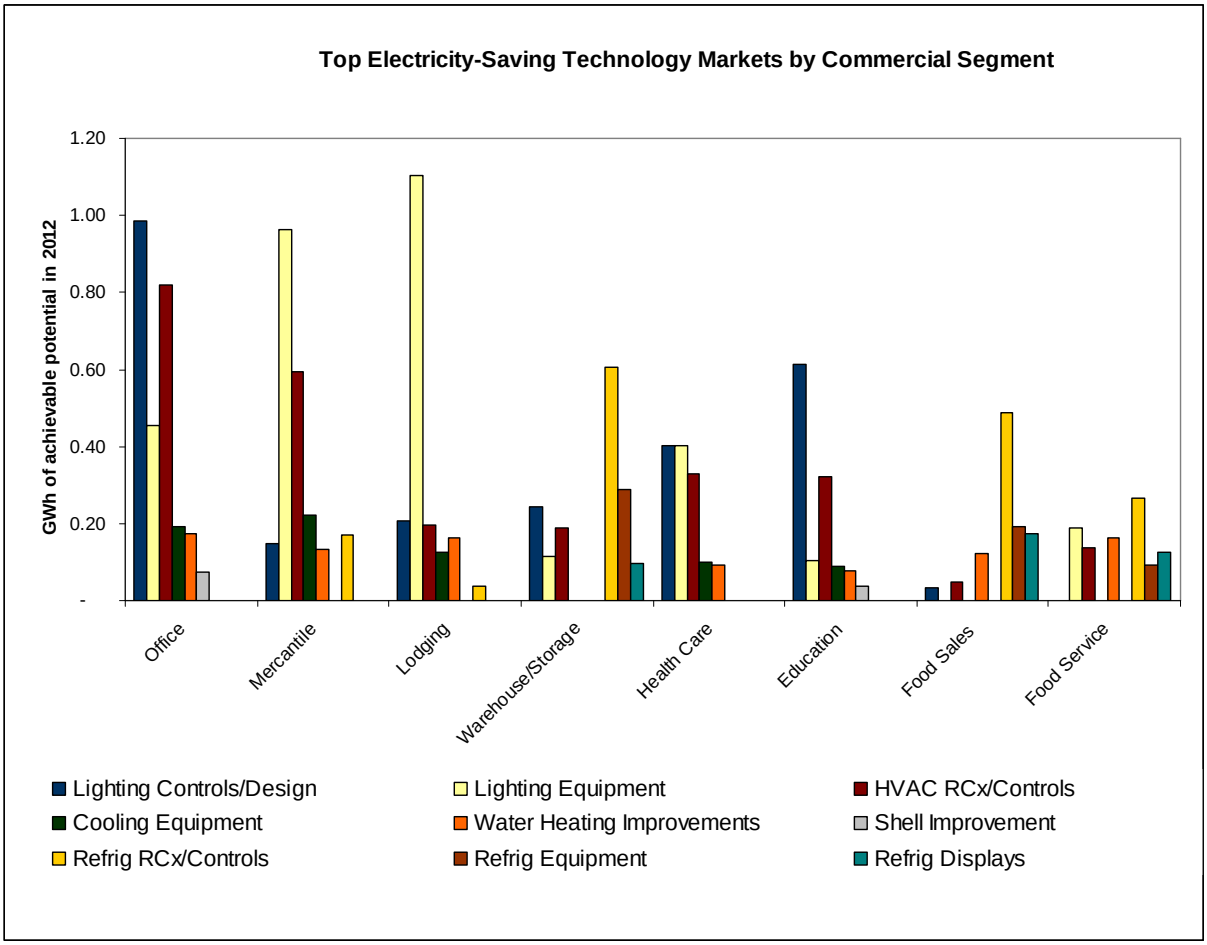

Figure 31: Top Electricity-Saving Technology Markets by Commercial Segment

Lighting measures are the largest component of electricity savings potential in most sectors, except for warehouse/storage facilities, food sales (grocery), and food service (restaurants), where refrigeration measures comprise a more significant portion of the potential. Control systems and retrocommissioning

(RCx) for existing HVAC systems, as well as new energy-efficient cooling equipment, are other key areas of opportunity across multiple segments of the commercial market.

Figure 32 compares the top natural gas-saving technologies by commercial market segment.

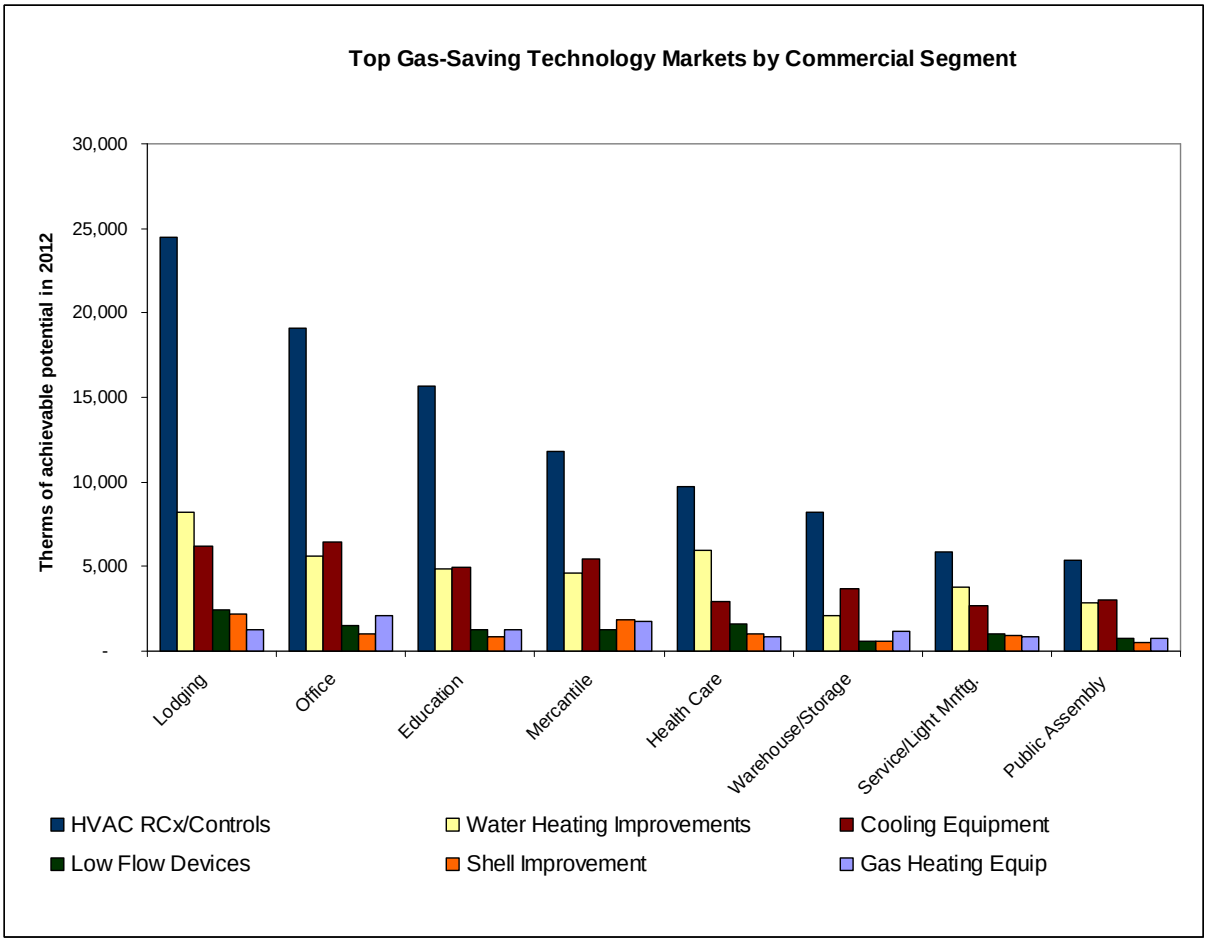

Figure 32: Top Natural Gas-Saving Technology Markets by Commercial Segment

Across all commercial segments, control systems and RCx for existing HVAC systems represent the largest opportunities, followed by water heating system improvements. The large potential associated with cooling equipment is due to geothermal heat pumps, which save significant amounts of natural gas in addition to reducing electricity consumption for cooling.

DEMAND RESPONSE

The Energy Center evaluated two types of demand response technologies within the energy efficiency potential model: (1) thermal energy storage for large C&I applications; and (2) direct load control (DLC) for residential and commercial applications. Results from our assessment of demand reduction potential from dynamic pricing are also included in this section.

Direct Load Control and Thermal Energy Storage

Quantitative estimates of demand response potential from DLC and thermal storage devices are part of (not additional to) the demand reduction estimates presented in the previous section. Thermal energy storage systems produce ice during off-peak periods which is then used to cool the building during the day. Large C&I facilities may pursue thermal energy storage as a strategy for reducing the costs associated with peak demand charges. However, under the MISO-based avoided costs used in the Energy Center's model, thermal energy storage systems were not cost-effective, so economic and achievable potential estimates do not include demand reduction associated with these measures.

DLC programs are the most common type of demand response strategy. To reduce electricity demand during times of peak system load, utilities use remote switches to interrupt or cycle energy-using equipment at the customer's home or business, generally with little or no advance notice to the customer. Participation is voluntary, and customers receive an annual incentive or bill discount for participating. DLC programs typically address central air conditioning loads, but may also include water heater loads. Load control devices have grown increasingly sophisticated in recent years. Where radio-controlled switches were used in early DLC programs, today's programs use digital paging networks that allow for independent control of individual pieces of equipment.[22] Some utilities are even deploying "smart thermostats" which allow remote adjustments to temperature settings.

The Energy Center's analysis included DLC for central air conditioners and water heaters in the residential and commercial markets. Results are presented in Table 1.

TABLE 1. DEMAND REDUCTION POTENTIAL FROM DIRECT LOAD CONTROL

Sector	2012 Achievable Potential (MW)	2018 Achievable Potential (MW)
Commercial	0.14	0.14
Residential	0.43	1.00
TOTAL	**0.57**	**1.14**

In the residential sector, DLC represents around seven percent of achievable peak demand reduction potential for 2012, and around ten percent of achievable peak demand reduction potential for 2018. In the

[22] Federal Energy Regulatory Commission (2006). *Assessment of Demand Response and Advanced Metering*. Staff Report. Docket No. AD-06-2-000.

commercial sector, DLC represents around two percent of achievable peak demand reduction potential for 2012, and around one percent of demand reduction potential for 2018.

Advanced Rate Design

The Energy Center also conducted a high-level assessment of the impact that advanced rate design could have on peak electricity demand. The term "advanced rate design" refers to utility rate structures that employ dynamic pricing, where the retail cost of electricity varies according to electric demand. The most common dynamic rate structures include:[23]

- **Time of Use (TOU) Rates**: Rate structures that employ standard differentiated prices for electricity consumed during on-peak and off-peak periods, which are consistent throughout the year. In some cases TOU rates also include seasonal price differentiation.
- **Real Time Pricing (RTP)**: Rate structures that vary continuously according to the wholesale price of electric power.
- **Critical Peak Pricing (CPP):** Rate structures that employ a high price that comes into effect during "critical peak" periods of high electric demand, typically with some advance notice to the customer (as much as one day ahead or in some cases only a few hours ahead).

Though some studies show energy savings impacts resulting from dynamic rate offerings, historically the primary objective of these rate structures has been reducing peak electric demand. A recent survey of historical impacts resulting from dynamic pricing programs in the residential market concluded that:[24]

- Introducing time-of-use rates with *broadly-defined* on-peak and off-peak periods can reduce peak demand by three to six percent.
- Introducing time-of-use rates with *more-specific critical period pricing* can reduce peak demand by 13 to 20 percent.
- Introducing time-of-use rates with *more-specific critical period pricing* along with *providing consumers with advanced technologies* so that they can react to those prices, can reduce peak demand by 27 to 44 percent.

In depth pricing-based forecasting was beyond the scope of this study, but we developed a first-order estimate of the demand reduction potential associated with dynamic pricing structures by applying general assumptions reported in the 2008 potential study for Iowa IOUs.[25]

We considered four dynamic pricing strategies: (1) TOU rates for residential customers; (2) CPP rates without enabling technologies for residential customers; (3) CPP with enabling technologies for residential customers[26]; and (4) CPP rates with no enabling technologies for commercial customers.

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[23] U.S. Department of Energy and the U.S. Environmental Protection Agency. *National Action Plan for Energy Efficiency* (2006) Available at: www.epa.gov/eeactionplan.
[24] A. Faruqui and S. Sergici (November 2008). *Household Response to Dynamic Pricing of Electricity: A Survey of Seventeen Pricing Experiments*. The Brattle Group.
[25] Quantec (2008). *Assessment of Energy and Capacity Savings Potential in Iowa*. Prepared for the Iowa Utility Association in collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group.

The Energy Center used participation rates and estimated gross load reductions from each dynamic pricing model as reported in the Iowa IOU study, with minor modifications under the two variants of CPP pricing in the residential sector. The IOU study did not specify whether enabling technologies were included in their residential CPP model, but the authors assumed a 27 percent reduction in customer load during critical peak events. The 2008 meta-study of dynamic pricing program impacts found that without enabling technologies, residential peak demand reduction was between 13 and 20 percent, and with enabling technologies residential peak demand reduction was between 27 and 44 percent.[27] To be conservative, we used the mid-point of the first range for non-technology-enabled CPP (16.5 percent reduction in peak demand), and assumed a 27 percent reduction in peak demand from technology-enabled CPP.

Results are presented in Table 2.

TABLE 2. DEMAND REDUCTION POTENTIAL FROM DYNAMIC PRICING

Dynamic Rate Offering	Sector	Eligible Load 2012 (MW)[28]	Program Partic. Rate	Event Partic. Rate	% of Gross Load Reduced	2012 Potential (MW)
TOU Rate	Res	382	8%	N/A	5%	1.53
CPP No Tech	Res	382	5%	95%	17%	3.03
CPP Tech-Enabled	Res	382	5%	95%	27%	4.90
CPP No Tech	Com	314	12%	56%	8%	1.69

The Energy Center estimates that peak demand within IAMU member service territory in 2012 will be approximately 1180 MW. Residential TOU pricing is estimated to reduce this peak by 0.4 percent. Critical peak pricing in the residential market is estimated to reduce this peak by around 0.8 percent without enabling technologies, and by around 1.3 percent with enabling technologies. CPP rates in the commercial sector are estimated to reduce peak demand by around 0.5 percent.

It is important to acknowledge that dynamic pricing structures could potentially lead to increased carbon emissions. Peaking plants that serve the mid-day summer loads are among the cleanest on the system as they are typically fired with natural gas. The majority of base load and intermediate load plants are coal-fired. Thus, shifting demand from the peak period to the shoulder period shifts generation responsibility

[26] Enabling technologies automate the response to critical peak prices. One example of an enabling technology is a smart thermostat that increases temperature set-points in response to utility price signals.
[27] A. Faruqui and S. Sergici (November 2008). *Household Response to Dynamic Pricing of Electricity: A Survey of Seventeen Pricing Experiments*. The Brattle Group.
[28] IAMU did not have sector-level data on peak electric demand in member service territories. As a first order approximation, we used the average allocation of peak demand by sector for MidAmerican Energy and Alliant Energy, as reported in the 2008 Iowa IOU potential study (32 percent residential, 27 percent commercial, and 41 percent industrial).

from the natural gas-fired plants to the coal-fired units. While combustion of either natural gas or coal leads to CO_2 emissions, coal-fired plants produce greater emissions than are natural gas plants.

DISTRIBUTION SYSTEM EFFICIENCY OPPORTUNITIES

The Energy Center examined several key technologies for increasing energy efficiency on the utility distribution system: energy efficient transformers and low-loss surge arresters. The former represents a capital-intensive opportunity with potentially large per-unit savings for utilities and their customers. The latter offers the opportunity for significant savings through adoption of high-efficiency versions of common or highly "commoditized" power distribution equipment.

These opportunities for energy savings and demand reduction are distinct from the demand-side opportunities that are the primary focus of this report, as in many cases utilities can deploy energy efficient supply-side technologies without requiring any action on the part of their customers. However, there are also some demand-side opportunities for transformers.

The Energy Center estimates that the technologies discussed in this section could reduce losses by between 1,400 and 2,700 MWh each year, which is equivalent to 0.03 percent to 0.06 percent of total IAMU electricity sales.

Transformers

Transformer efficiency improvements can be categorized into two groups: demand-side and supply-side. On the demand side, secondary distribution transformers owned by large C&I customers are typically three-phase, low to medium voltage, dry-type transformers operating at between 35 and 50 percent of nameplate load. Over the past several decades, transformers of this type were purchased on a first cost basis, with relatively little emphasis on total ownership costs and efficiency ratings.[29] A different trend has typified supply-side transformers. Energy concerns in the late 1970s and the early 1980s prompted many utilities to adopt a "total ownership approach", where the cost of lifetime losses was incorporated into transformer purchasing decisions. Not surprisingly, this attitude translated into a steady rise in the efficiency ratings of utility-owned liquid-immersed single and three-phase transformers. Some estimates suggest that only about 25 percent of newly sold liquid-immersed transformers and as much as 90 percent of newly sold dry-type transformers remain below NEMA TP-1 efficiency standards.[30]

Regardless of historical market trends, the energy savings stemming from newly enacted federal standards are likely to be significant. We estimate that replacement of failed supply-side transformers with newer, more efficient models could lead to annual loss reductions on the order of 1,260 to 2,100 MWh (0.03 to 0.04 percent of total IAMU sales).[31] Demand-side savings could be significant as well. Dependent upon assumed base saturation rates, standards pertinent to demand-side transformers could reduce the

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[29] Barnes et al. (1995). "*Determination Analysis of Energy Conservation Standard for Distribution Transformers*." Oak Ridge National Laboratory, U.S. Department of Energy.
[30] American Council for an Energy Efficient Economy, et. al. (2004). *Distribution Transformer Efficiency Standards: What's At Stake?*
[31] These estimates assume median useful lives of 30 years for existing transformers and a range of 0.5-1.0 percent for average efficiency gains between typical IAMU replacement units and those meeting new federal standards. Efficiency gains could be appreciably higher, depending upon the age and quality of existing transformers.

electricity consumed by IAMU C&I customers by as much as 145 to 580 MWh annually (0.003 percent to 0.01 percent of total IAMU sales, or 0.004 to 0.02 percent of IAMU C&I sales).[32]

Recent federal standards will affect the ability of municipalities to design and implement cost-effective incentive programs that are relevant to the bulk of the transformer market. The U.S. Department of Energy's (DOE) final rule on distribution transformers mandates that new transformers sold within the United States meet minimum efficiency standards by January 1, 2010. These federal standards cover a wide range of transformer sizes, types and applications. Both new and pre-existing standards will virtually invalidate the potential for "replace on burnout" (ROB) incentive programs, because the existence of a federal standard means that cost-effective, high-efficiency replacement equipment will be considered to be "naturally occurring" efficiency within the marketplace, and thus utility programs could not receive credit for associated savings. It is theoretically possible that incentive programs could be designed for transformers exceeding the new federal standards; however, DOE's process for constructing its final ruling used a rigorous benefit/cost ratio and lifecycle cost assessment. Consequently, it is not likely that devices exceeding the recently-enacted federal standards (at least for those devices demonstrating a significant margin of savings) would pass an economic screening process. In fact, the Energy Center's model suggests that TRC ratios for 'super-premium' or Tier II dry-type transformers, to the extent that they may currently exist, are below 1.00 (~0.25).

Several studies have been completed on alternatives to the traditional ROB program design. An immediate retrofit of inefficient transformers with high efficiency units has been found to be both cost-prohibitive and impractical.[33] However, a study by Oak Ridge National Laboratory (ORNL) found that foregoing the continued use of repaired or refurbished units removed during routine maintenance in favor of new, high-efficiency models was found to be cost-effective for transformers that have been in operation for 22 years or more.[34] In addition, the DOE's recent ruling omits refurbished or remanufactured devices from the new efficiency standards. Although some distributors of remanufactured devices claim that their products attain high levels of efficiency, it may be the case that such devices are less efficient due to their age. There is also the possibility that damage incurred during removal and repair could contribute to reductions in efficiency. Conceivably, IAMU could convince member utilities or their C&I customers to purchase new, high-efficiency models in lieu of remanufactured devices. This small niche market may provide some opportunity for programmatic efforts; however, questions surrounding verified savings and free-ridership could present challenges for such efforts.

Surge Arresters

We also examined the savings that could accrue by adopting energy efficient alternatives for common, 'commodity-type' distribution system equipment. One such technology is the low-loss surge arrester. Surge arrestors are ubiquitous protective devices that are found in a variety of locations and applications throughout municipal power distribution systems. To provide their protective function, arresters are

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[32] This estimate assumes between 20 and 40 percent saturation rates (the percentage of C&I load that passes through on-site, secondary distribution transformers) and efficiency gains between 0.75 and 1.5 percent.
[33] Barnes et al. found that such a strategy results in a B/C ratio close to 0.6. Interruption of service and national supply of suitable replacement units were offered as additional reasons as to why such a strategy would be impractical. Barnes et al., (1995). *The Feasibility of Replacing or Upgrading Utility Distribution Transformers During Routine Maintenance*. Oak Ridge National Laboratory, U.S. Department of Energy.
[34] *Ibid.*

continuously energized, thus inefficient models can accumulate non-negligible energy losses over time. Individual savings for efficient arresters are small (on the order of 3.5 kWh per year for arrestors serving residential customers); however, their prevalence within the distribution grid can lead to significant savings overall. We estimate that purchasing efficient surge arresters could lead to annual reductions of 27 MWh within IAMU's residential customer base alone.[35] As such, surge arresters demonstrate that often-overlooked commoditized items can lead to real supply-side energy savings.

[35] Assumptions based on information supplied by Cooper Power Systems regarding the Evolution line of surge arresters. Key assumptions include annual savings of 3.54 kWh/arrester/year, 30 year useful life and saturation levels of 1.5 arresters per residential customer. An average incremental cost of $2-3/unit results in a TRC ratio greater than 1.0.

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SENSITIVITY ANALYSIS

It is likely that federal legislation regulating greenhouse gas (GHG) emissions will be enacted during the timeframe of this study. Therefore, we conducted a sensitivity analysis to estimate energy efficiency and demand reduction potential under a carbon cost scenario. We relied on the 2008 levelized carbon cost estimate reported by Synapse Energy Economics under its medium-range forecast, which equates to $30 per ton of carbon dioxide (CO_2) emitted.[36] Using Iowa emissions factors,[37] this carbon price equates to an increase of $0.0235/kWh and $0.18/therm over avoided costs used in the base analysis.

For comparison purposes, the increased avoided costs used in the carbon sensitivity scenario are within the range of estimated Iowa energy cost increases projected in a recent analysis sponsored by Midwest energy suppliers.[38] This analysis, completed in March 2009, analyzed a variety of scenarios for GHG allowance prices and carbon credit allocation mechanisms. By 2030 under the Moderate GHG Price scenario, Iowa energy prices are projected to increase by between 40 and 85 percent over 2005 energy prices. Starting with our base scenario avoided costs, such an increase would equate to between $0.09/kWh and $0.13/kWh for on-peak power, and $0.05/kWh and $0.7/kWh for off-peak power. At the carbon price of $30/ton used in the sensitivity analysis, on-peak avoided costs are $0.09/kWh and off-peak avoided costs are $0.6/kWh—consistent with the Energy Policy Group's Iowa projections under the Moderate GHG Price scenario.

Under the sensitivity scenario, electricity savings increase by 11 percent in 2012 and 18 percent in 2018, compared to the base scenario. Peak demand reduction potential increases by 8 percent in 2012 and nine percent in 2018, and natural gas savings increase by 17 percent in 2012 and 25 percent in 2018. The magnitude of avoided CO_2 emissions increases by around 11 percent in 2012 and 19 percent in 2018 under the sensitivity scenario.

Figure 33 compares 2012 and 2018 achievable potential for electricity savings, demand reduction, and natural gas savings under the base and sensitivity scenarios.

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[36] Synapse Energy Economics, Inc. (2008). *Synapse 2008 CO_2 Price Forecasts*.
[37] Center for Climate Strategies (2008). *Final Iowa Greenhouse Gas Inventory and Reference Case Projections 1990-2025*.
[38] Energy Policy Group, LLC (2009). *Analysis of the Electricity Price Impacts of Alternative Carbon Emission Cap-and-Trade Programs in the Midwest*. Prepared on behalf of Indiana Municipal Power Agency, Madison Gas and Electric Company, Missouri Joint Municipal Electric Utility Commission, Missouri River Energy Services, Southern Minnesota Municipal Power Agency, and WPPI Energy.

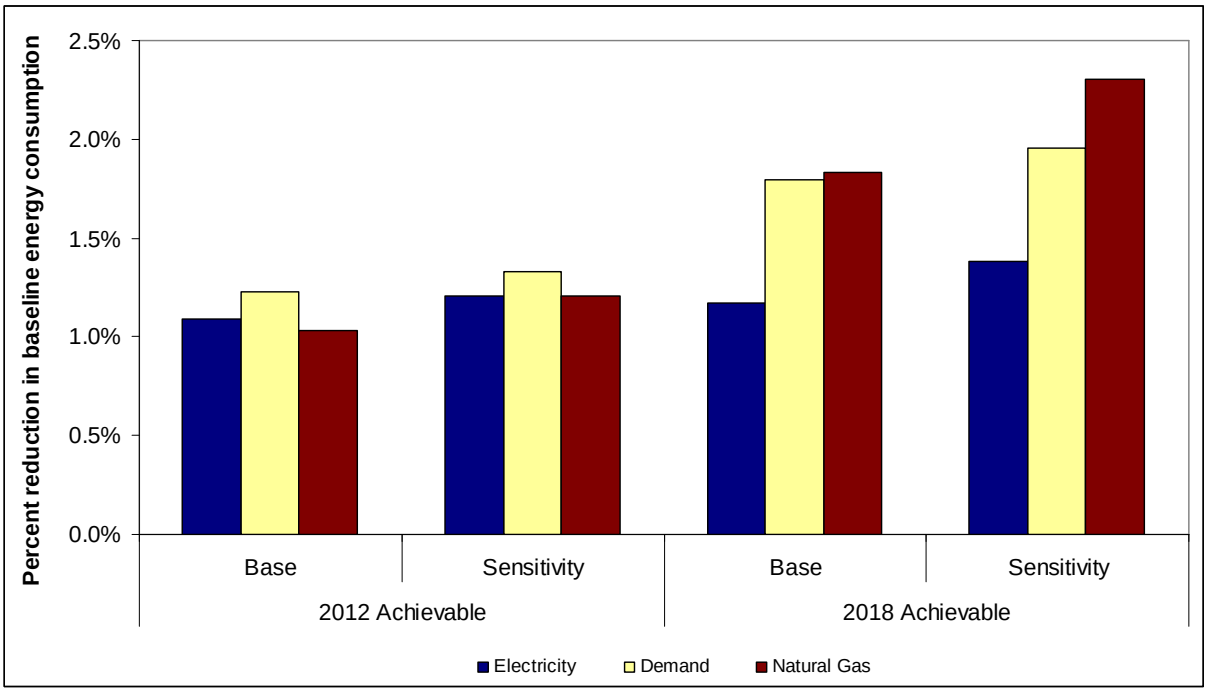

Figure 33: Comparison of Base and Sensitivity Scenarios, 2012 and 2018 Achievable Potential

While there are clearly some differences between the two scenarios, the gap is not as wide as one might anticipate. A number of measures that are not cost-effective in the base scenario pass the TRC screen in the sensitivity scenario, but the aggregate efficiency potential of these measures is not large. This result makes intuitive sense, as marginally cost-effective technologies that are associated with large savings potential represent attractive opportunities for research and development, leading to technological improvements that increase cost-effectiveness.

INNOVATIVE PROGRAM MODELS

A number of innovative energy efficiency program models are well-suited for deployment in municipal utility service territories, and have the potential to offer substantial increases in energy savings compared with standard program approaches. We provide a brief description of these innovative program models in the sections below.

Community Energy Initiatives

Community energy initiatives (CEIs) have recently been launched by WPPI Energy (a regional power company serving 50 municipal utilities in Wisconsin, Michigan, and Iowa) and Efficiency Vermont, among others.[39] CEIs seek to engage civic leaders in targeted energy efficiency outreach campaigns administered at the community level, and are tailored to meet the specific needs and opportunities of a given community. Such efforts often emphasize messaging around global warming and energy independence. CEIs may involve establishing local energy savings targets, increasing the energy efficiency of municipal facilities, raising awareness of energy efficiency opportunities through media outreach and local events, or leveraging local retailers in energy efficient product promotions. CEIs can also target local businesses, offering intensive account management services to identify energy efficiency opportunities through energy audits, energy analyses, and feasibility studies. CEIs may involve a direct installation component for small businesses and households, distributing low-cost measures such as CFLs and low-flow devices. Community groups, schools, and college/university campuses can be leveraged through events, volunteer opportunities, or comprehensive energy assessments of facilities and campuses. One recent advancement in CEIs is the introduction of competition, in which two communities set goals (individually or together) and compete to reach those goals first (or push past the goals). This model harnesses the natural inclination to outperform our peers, and has seen success particularly at the campus level.[40]

By nature, CEIs are scalable, and can be successful regardless of the size of the community. In fact, CEI's may be particularly well suited to small- to medium-sized municipalities such as those participating in the IAMU study, due to the greater sense of connection that may exist within small communities.

Neighborhood Blitz

The "neighborhood blitz" uses a community-based delivery approach to capture the substantial energy efficiency potential found in the residential retrofit market. All residences in a given neighborhood are informed that an audit crew will be in their area during a given week, and residents can sign up to receive an audit. Audit crews conduct walk-throughs and diagnostic tests (e.g., blower door tests, infrared scans) to identify opportunities for energy efficiency upgrades such as air sealing, increased wall and ceiling insulation, and replacement of inefficient heating, ventilation, and air conditioning (HVAC) equipment. Crews also offer direct installation of low cost measures such as low-flow showerheads, faucet aerators,

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[39] For additional information on Efficiency Vermont's Community Energy Mobilization Pilot, please see Efficiency Vermont's *2009-2011 Annual Plan*, available at: http://www.efficiencyvermont.org/stella/filelib/EVT%20Annual%20Plan%202009-2011.pdf.

[40] For information on the Minnesota Campus Energy Challenge, please visit: http://www.teammn.org/mcec.html. For information on the Oberlin College Campus Resource Monitoring System, please visit: http://www.oberlin.edu/dormenergy/.

and CFL bulbs. Implementation crews will return to the neighborhood at a specified time to implement the higher-cost upgrades that residents choose to receive. Similar to low income weatherization efforts, the program covers a substantial portion of the implementation cost—between 60 and 90 percent. The neighborhood blitz approach overcomes two barriers associated with retrofit opportunities. It addresses inertia barriers by coming to the customer and offering a comprehensive array of services, from identifying opportunities to implementing solutions. It addresses capital constraints by paying the lion's share of the implementation cost. A neighborhood blitz approach could also be adapted for small businesses. It could function as a stand-alone program, or be deployed as part of a CEI.

Behavior-Based Programs

Behavior-based programs include a broad cross-section of energy efficiency initiatives that seek to influence human choices affecting energy consumption. Such choices include purchasing decisions, operational and maintenance practices, equipment installation practices, or building design practices. Examples of behavior-based programs include informational campaigns; professional education for home builders, contractors, equipment suppliers, architects or engineers; feedback mechanisms that provide real-time information on energy usage; and social marketing efforts. Two approaches that are particularly well-suited for deployment in municipal utility service territories, and complement some of the other innovative program models discussed here include: (1) home visits that provide information on energy-savings opportunities, and (2) social marketing initiatives that provide bill-based feedback and information to households.

Program administrators have long used walk-through audits as a mechanism for providing information on saving energy. With increasing recognition of the energy impacts of growing household plug load, home visits can also be an effective mechanism for teaching households how to program thermostats and change power-saving settings and brightness levels on computers, televisions, and other home electronics. Programs can train volunteers to go into their community and deliver this type of information to consumers as part of a CEI, as Efficiency Vermont is doing through its Community Energy Mobilization Pilot.

Social science research has demonstrated that individuals often use the behavior of others as a guide in their own decision-making processes, so norms-based approaches to promoting energy efficiency improvement can be a powerful strategy for program administrators.[41] A number of utilities, including Sacramento Municipal Utility District (SMUD) and Puget Sound Energy, have launched pilots that provide customers with detailed information about their household energy consumption and information on how their usage compares with similar households in their area. SMUD found that customers who received a personalized energy report reduced their energy consumption by two percent, compared with customers who received a standard bill.[42] In addition to paper reports, some utilities are using web-based tools that provide enhanced usage information to their customers. Reports should include information on actions customers can take to reduce their bills, such as energy savings tips and information on available

[41] ACEEE (2008). *Behavior, Energy, and Climate Change: Policy Directions, Program Innovations, and Research Paths*. Report No. E087. Available at: http://aceee.org/pubs/e087.pdf?CFID=3548193&CFTOKEN=16466493.
[42] Leslie Kaufman (January 30, 2009). "Utilities Turn Their Customers Green, With Envy." *New York Times*. Available at: http://www.nytimes.com/2009/01/31/science/earth/31compete.html?em.

rebates. It is also critical to provide regular updates so that customers can monitor their performance over time.[43]

Upstream Strategies

Most energy efficiency programs employ a downstream incentive strategy, offering consumer rebates to offset the higher cost of purchasing an energy efficient product as compared with a similar, standard efficiency product. However, a growing number of programs are pursuing upstream incentive strategies, offering incentives to retailers, equipment suppliers, or other market actors to reward increased sales of energy efficient products.[44]

Under an upstream approach, the equipment supplier receives an incentive for every unit of energy efficient equipment they sell, or for increasing sales by a certain percentage over a specified baseline. Basing incentive payments on an increase over an established sales baseline is preferable, as this approach awards incremental increases in equipment sales, reducing free ridership and conserving program resources. All upstream approaches require the supplier's willingness and ability to share sales data with the energy efficiency program manager; suppliers will typically require confidentiality of such data if it is proprietary.

Municipal utilities may have limited ability to leverage large national or regional retailers for reasons of scale. Upstream approaches present challenges in terms of ensuring that incentive-eligible equipment is installed within the municipal utility's service territory, where customers of multiple utilities are purchasing products from the same store. At the same time, local retailers are good candidates for municipal utility programs, and could be leveraged as part of a CEI. Local equipment suppliers, such as HVAC contractors or electrical suppliers, also represent good candidates for partnership, and it is easier for these market actors to provide documentation on where equipment is installed than it would be for a mass market retailer.

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[43] ACEEE (2008). *Behavior, Energy, and Climate Change: Policy Directions, Program Innovations, and Research Paths*. Report No. E087. Available at: http://aceee.org/pubs/e087.pdf?CFID=3548193&CFTOKEN=16466493.
[44] ACEEE's profile of the PG&E Motor and HVAC Distributor Program provides one example of a best practice upstream incentive program, available at: http://aceee.org/pubs/u081/ci-motor-hvac.pdf. This profile was published in ACEEE's 2008 report, *Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.*

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Appendix 2

Appendices to the Assessment of Energy Efficiency Potential by Energy Center of Wisconsin

Note that Appendix C of the ECW Report Contains the TRC Text

LIST OF APPENDICES

Appendix A: Global Modeling Assumptions

Appendix B: Technology Market Definitions

Appendix C: Measure Inputs

Appendix D: Detailed Results

Appendix E: Top Energy-Savings Opportunities within the Commercial Market

Appendix F: Allocation of Potential and Program Costs to IAMU Members

Appendix G: Survey Instruments

APPENDIX A : GLOBAL MODELING ASSUMPTIONS

Appendix A summarizes the key assumptions employed in the efficiency potential model and TRC calculations used to determine measure cost-effectiveness.

A five percent discount rate was used to obtain the net present value of future energy savings. This rate is consistent with societal discount rates used in other studies, including the 4.81 percent societal discount rate (nominal) used in the 2008 study of energy efficiency potential for Iowa investor-owned utilities (the "IOU study").[1]

For electricity, avoided energy costs are based on historical Iowa locational marginal prices (LMPs) from the Midwest Independent System Operator (MISO), as provided by IAMU's load forecasting consultant.[2] Energy efficiency measures reduce energy consumption and associated costs, and avoided costs based on MISO LMPs provide a primary basis for valuing those electricity savings. MISO LMPs reflect the cost of energy and the implied cost of generation capacity, but not the cost of transmission or distribution (T&D) capacity, nor do they reflect line losses. Therefore, we also included an avoided T&D cost of $30/kW, based on an average of published values from Alliant Energy's and MidAmerican Energy's 2009-2013 energy efficiency plans.[3] Natural gas avoided costs are based on published values from Alliant Energy's 2009-2013 energy efficiency plan. Iowa Administrative Code also specifies an externality factor to be applied in valuing avoided electricity and natural gas consumption.[4]

For the carbon sensitivity analysis, we included an additional carbon price per kWh and per therm on top of the avoided costs and externality factors used in the base analysis. The values for avoided carbon emissions are based on a 2008 levelized carbon cost estimate of $30 per ton of CO_2 emitted, under the medium-range forecast developed by Synapse Energy Economics, Inc.[5] This price was converted to a price per kWh and per therm using carbon emissions factors reported in a recent report published by the Center for Climate Strategies, *Final Iowa Greenhouse Gas Inventory and Reference Case Projections 1990-2025*.[6]

Avoided cost and externality factors used in this analysis are summarized in Table A-1.

[1] Quantec (2008). *Assessment of Energy and Capacity Savings Potential in Iowa*. Prepared for the Iowa Utility Association in collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group.
[2] Personal communication with Marlin Vrbas, PS Analytics (September 19, 2008).
[3] Interstate Power & Light Company (2008). *2009-2013 Energy Efficiency Plan*. Docket No. EEP-08-1.
MidAmerican Energy Company (2008). *2009-2013 Energy Efficiency Plan*. Docket No. EEP-08-2.
[4] The Energy Center used externality factors specified in the *Iowa Administrative Code* (Sec. 199—35.9(476) and 199—35.10(476)): a 10% adder for electricity, and a 7.5% adder for natural gas.
[5] Synapse Energy Economics, Inc. (2008). *Synapse 2008 CO_2 Price Forecasts*.
[6] Center for Climate Strategies (2008). *Final Iowa Greenhouse Gas Inventory and Reference Case Projections 1990-2025*.

TABLE A-1. AVOIDED COSTS AND EXTERNALITY COSTS

	Summer Peak	Summer Off-Peak	Winter Peak	Winter Off Peak
Electricity ($/kWh)	$0.069	$0.032	$0.064	$0.035
Avoided T&D capacity ($/kW-year)	$30.00		$30.00	
Electric externality adder ($/kWh) – 10%	$0.0069	$0.0032	$0.0064	$0.0035
Carbon adder ($/kWh) – sensitivity analysis only	$0.0235	$0.0235	$0.0235	$0.0235
Electric capacity externality adder ($/kW) – 10%	$3.00		$3.00	
Natural gas ($/therm)	$0.89		$1.00	
Natural gas externality adder ($/therm) – 7.5%	$0.067		$0.075	
Carbon adder ($/therm) – sensitivity analysis only	$0.18	$0.18	$0.18	$0.18

The costs associated with measure installation include the incremental cost of energy efficient equipment as compared with the standard efficiency alternative, installation costs, and annual operations and maintenance costs. In addition, program administrative costs are factored into the TRC test. Program administrative costs include the non-incentive costs associated with program planning and implementation, and include costs associated with program design, marketing and outreach, education and training, evaluation, and administrative functions.

Administrative costs typically vary based on program design, target market, program maturity, and other factors. To maintain a simple, transparent analytical structure, the Energy Center applied *pro rata* program administrative cost factors at the measure level, rather than bundling measures into programs, which can be a subjective and analytically opaque process. The Energy Center developed administrative program cost factors on a per-kWh and per-therm basis using historical program expenditures and savings results from energy efficiency programs in Iowa (MidAmerican Energy and Alliant Energy), Wisconsin (Focus on Energy), Minnesota (Southern Minnesota Municipal Power Agency and Xcel Energy), and Vermont (Efficiency Vermont). These historical data showed relatively minor variability across programs for the C&I market, but some differences between programs for the residential market. Administrative cost factors are summarized in Table A-2.

TABLE A-2: ADMINISTRATIVE PROGRAM COST FACTORS

Measure Type	$/kWh	$/therm
Residential lighting and appliances	0.005	0.040
Residential new construction and building shell	0.009	0.140
Commercial, industrial, and agricultural	0.003	0.030

As noted in the report, the Energy Center's model uses 2006 baseline energy sales data to produce energy efficiency potential estimates. Results were scaled up to projected 2012 and 2018

sales levels using sector-specific and fuel-specific annual sales growth rates, as shown in Table A-3. As sales forecasts for IAMU member utilities were not available, we used average annual sales growth rates as forecast by Iowa investor-owned utilities (IOUs).[7]

TABLE A-3: SALES GROWTH RATES

Sector	Annual Electricity Sales[8] Growth	Annual Natural Gas Sales Growth
Residential	1.56%	-0.36%
Commercial	1.76%	0.15%
Industrial	1.83%	0.04%

[7] Quantec (2008). *Assessment of Energy and Capacity Savings Potential in Iowa*. Prepared for the Iowa Utility Association in collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group.

[8] As the Iowa IOU study did not include forecasts for peak demand growth, the same growth rate was used for electricity sales and peak electric demand.

APPENDIX B : TECHNOLOGY MARKET DEFINITIONS

RESIDENTIAL TECHNOLOGY MARKETS

Electric Efficiency

In-unit lighting: This category includes retrofit and replace-on-burnout of standard light fixtures and bulbs to more efficient fixtures/bulbs—principally compact fluorescents but also LEDs.

High-efficiency heating equipment: This category primarily deals with the replacement of standard furnaces with models featuring electronically commutated blowers, or the retrofit of existing furnaces with electronically commutated blower motors.

Common-area lighting: This category includes retrofit and replace-on-burnout of incandescent fixtures and bulbs in multifamily common areas to more efficient fixtures.

High-efficiency cooling equipment: In addition to the replacement of central air conditioners with efficient, properly sized models, this category also addresses the use of air source heat pumps for cooling (with desuperheaters for water heating) and improved ductwork designs in new construction.

Shell improvements for space cooling: This category contains technologies such as cool roofs and radiant barriers to improve heating and cooling performance for existing homes. Weatherization measures such as insulation and air sealing are also considered.

Ventilation improvements for space cooling: Measures in this category include upgrades to existing ceiling fans and the installation of whole-house fans. For new construction, this market includes the use of sub-slab ventilation.

Whole-home smart switches and displays: Technologies in this market allow home owners to have greater ability to understand how their home uses electricity and be able to put plug-load devices on one whole-house switch to reduce the power consumption of this equipment while in low-power “off” modes.

Natural Gas Efficiency

High-efficiency space heating equipment. This market includes both the use of high efficiency furnaces and boilers as well as that of air-source and ground-source heat pumps. This measure also covers increasing the quality of new home design and construction, considering building to ENERGY STAR levels, exceeding ENERGY STAR and building to Passivhaus levels.

Sensors and controls for space heating: This market looks at programmable thermostats and other controls for gas heating equipment, including zoning controls. It also addresses the use of thermostatic vents in the multifamily sector.

Hot water conservation: This market includes measures ranging from faucet aerators and low-flow showerheads to hot water demand recirculation, shower controls and, in new construction, improved plumbing layout.

High-efficiency water heating equipment: Water heaters under consideration here include whole-house tankless water heaters, heat pump water heaters, indirect-fired water heaters and high efficiency traditional water heaters. This measure also considers ENERGY STAR clothes washers and dishwashers.

Weatherization direct install: These measures presuppose an audit crew working intensively in a given neighborhood, conducting walkthrough audits and comprehensive diagnostics based on building science to identify opportunities for energy efficiency improvement. These might include air sealing, increased wall and ceiling insulation, and replacement of inefficient HVAC equipment. Direct installation of low cost measures such as low-flow showerheads, faucet aerators, and CFL bulbs can be offered during the initial walk-through.

COMMERCIAL TECHNOLOGY MARKETS

Electric Efficiency

Lighting equipment: This category includes retrofit and replace-on-burnout of standard light fixtures and bulbs to more efficient fixtures/bulbs. Examples include advanced metal halides, LEDs for specific applications (traffic lights, task lighting, exit lights, refrigeration case lights, and exterior lights), high performance fluorescents, and CFLs (screw in, pin-based, and flood types).

Lighting controls and design: This technology market includes two similar efficiency approaches. First, it includes retrofit of existing lighting systems to include controls such as occupancy sensors (including bi-level stairwell lighting), daily schedules (for interior or exterior), and daylight sensors. Secondly, this market includes the controls above integrated into new construction where they are not already mandated by code, coupled with efficient layout of the fixtures in those new systems. The efficiency of the fixtures themselves is covered by the 'lighting equipment' category.

HVAC controls and retrocommissioning (RCx): This category includes retrofit/optimization of existing HVAC controls through measures such as temperature resets, chiller optimization, direct load control of cooling equipment, hotel guest room heating/cooling controls, basic HVAC maintenance (service buy-downs), and thermostat setbacks/shutoffs. Additionally, this category includes retrocommissioning efforts designed to correct all problems with existing controls, distribution systems, and equipment sequences. Finally, this category includes installing a full building energy management system and commissioning new HVAC systems.

Refrigeration controls and RCx: This category includes advanced devices and controls integrated into refrigeration systems (primarily in supermarket, food service, and warehouse buildings), including display cases. Measures include advanced control of anti-sweat heaters, case lighting timers, fan cycling, defrost, floating head pressure, and e-cube. Also includes

installation of strip curtains, door gaskets and auto-closers, and basic system maintenance (service buy-downs). Finally, this category includes floating head pressure control in all major new refrigeration systems.

Cooling equipment: This category includes use of higher efficiency cooling equipment (chillers, rooftop/packaged AC, heat pumps) in all markets (retrofit, replace-on-burnout, and new construction). Also includes use of dessicant dehumidification, UV coil cleaning, premium efficiency and variable speed fans, and free cooling (beyond code) integrated into cooling equipment.

Water heating improvements: This category includes retrofit installation of gray water heat exchangers, high efficiency water heaters (including heat pump water heaters), heat traps, reduced temperature setpoints, insulation of tanks/pipes, and system timers. Also includes condenser heat recovery and efficient system layout and pumping design in new construction.

Shell improvement: This category includes advanced insulating, air sealing, and high performance windows in both new and existing buildings. Also includes integrated building design in new construction.

Natural Gas Efficiency

HVAC controls and RCx: This category includes all measures discussed in the electric market above, but also includes retrocommissioning of boilers and hot water distribution (including conversion of steam systems to hot water).

Water heating improvements: See electric market definitions—measures are the same but capture savings from gas-fired water heating systems.

Cooling equipment: This category appears on the gas list due solely to geothermal heat pumps, which have a large potential in Iowa assuming they remain cost-effective.

Faucets and nozzles: This category includes automatic faucet controls and low flow faucets, rinse nozzles, and showerheads.

Gas heating equipment: This category includes use of higher efficiency heating equipment (boilers, furnaces, and unit heaters) in all markets (retrofit, replace-on-burnout, and new construction). Also includes solar ventilation pre-heat and radiant floor heating systems.

Shell improvement: See electric market definitions—measures are the same but capture savings from gas-fired heating systems.

INDUSTRIAL TECHNOLOGY MARKETS

Electric Efficiency

Motors – new, variable speed drive (VSD), and optimization: This category includes savings that accrue through the implementation of the following set of measures and are applicable to industrial process motor load: (1) Use of adjustable or variable speed drives to better accommodate periods of changing process loads; (2) Optimization of motors through such measures as resizing in order to more accurately reflect actual process load; and (3) Use of premium efficiency motors. (Savings in this motor category were downgraded to reflect recent changes in federal motor efficiency standards.)

Lighting equipment: This category includes replacement of inefficient high-bay and non high-bay lighting fixtures with more efficient lighting alternatives, including high performance T8/T5 fixtures and pulse start metal halide fixtures. The category considers retrofit of existing fixtures as well as the use of high efficiency lighting in new construction.

Motor component improvement: This category includes retrofit improvements to the components of systems driven by process motor load, including the replacement of fans, blowers, pumps, belts and other mechanical components with a higher efficiency alternative.

Process cooling (motor-related): This measure is similar to the motor category described above, but includes the use of VSDs on refrigeration pumps and fans, as well as electrically commutated and permanent split capacitor shade pole motor types. This measure category only pertains to electrical energy expended in process related cooling and refrigeration.

Lighting controls and design: This category includes the use of timers, scheduling controls, occupancy sensors and efficient lighting design in existing buildings and new construction.

HVAC system and controls: This category includes the use of HVAC system controls, timers, and sensors, including programmable thermostats, building energy management systems, and ventilation controls.

Natural Gas Efficiency

Process heating – improved operations and management (O&M): Principally considers the use of controls, timers and sensors to reduce energy consumption to levels demanded by processes in real time. This measure category also considers energy savings that might accrue to improvements in process planning and load management.

Steam production – design/control: This category considers retrofits applicable to steam generation systems and includes process heat recovery, condensate recovery, damper controls, improved feed controls, steam system isolation, O_2 trim controls, heat traps, and air pre-heaters.

Process heating – insulation and sealing: This category seeks to reduce process heat loss through the use of enhanced or additional insulation and by eliminating leaks in heat containment equipment.

Steam production – improved O&M: This category considers improvements in energy efficiency through boiler tune-ups, periodic cleaning of heat transfer surfaces, steam trap maintenance as well as industry-specific optimization measures (primarily in the chemical industry).

Steam production – equipment upgrades and/or replacement: Includes the use of higher efficiency industrial boilers and upgrades and/or replacements of burners on existing boilers.

Process heating – equipment upgrades/replacement: Primarily includes the use of advanced gas drying and heating technologies, emissions control improvements and burner upgrades.

APPENDIX C : MEASURE INPUTS

Input Table Definitions

Segment: Applicable market segment for the energy efficiency measure. The residential sector is broken into four market segments: single family homes (SF), mobile homes (MH), small rental (RS, 1-4 units) and large rental (RL, 5+ units). The commercial and industrial sectors were segmented by principal business activity according to CBECS and NAICS classifications, respectively.

Market: Equipment market that is applicable to the measure: New Construction (NC), Retrofit, or Replace on Burnout (ROB).

End Use: Major energy end use category (lighting, HVAC, etc.) that applies to the measure.

Measure: Short description of the measure.

Base Saturation: In the residential sector, the base saturation is the number of homes that possess the base technology applicable to the measure. In the commercial, industrial and agricultural sectors, base saturation is expressed in terms of energy rather than as a percentage of existing building stock. The base saturation considers the percentage of housing stock or energy consumption for which a conversion to the energy-efficient technology is feasible. For example, for a boiler measure in the 'Office' segment, base saturation represents the percentage of office building energy consumption that is used by boilers AND which is eligible for conversion to a higher efficiency unit.

EE Saturation: Energy Efficient (EE) saturation is the percentage of housing units or energy consumption within the base saturation (as defined above) that already possesses the energy-efficient technology.

Technical Savings Rate: The percentage of base energy consumption that is saved by implementing the energy-efficient measure.

Measure Useful Life: The duration of time for which the measure is expected to provide savings, based on the median lifetime of installed measures and expressed in years.

Base Annual Market Size Applicable to Measure (GWh or BBtu): The total amount of energy that is available on an annual basis for applying a specific energy saving measure. For the Retrofit market, this quantity is a function of the percentage of homes or energy that is considered to possess or utilize the base technology. The ROB market is the product of the inverse of the base technology's useful life and base consumption per unit. The NC market is reliant upon sector population growth rates. The base annual market size is multiplied by the technical savings rate and the 'Annual Impact of Aggressive Programs' to determine the annual achievable potential (before interaction).

Delphi Entry (O, L, M, or H): Measures included in a Delphi survey are identified with an "O." Non-Delphi measures were ranked low, medium, or high potential (L=Low, M=Medium, or H=High) based on a qualitative assessment of the degree to which aggressive programs could 'move' the marketplace. Non-Delphi measures were ranked low,

medium, or high potential based on the effective base saturation, current EE saturation levels, and useful life.

Annual Impact of Aggressive Programs (%): Also referred to as the "achievable factor" in the Methodology section of the main report, these percentages represent the portion of the market that can be induced to convert to the energy-efficient measure under the most aggressive programs on an annual basis.

Load Reduction Factor (kW/kWh): Correlates energy savings (kWh) to demand savings (kW). These factors consider the percentage of demand coincidence with summer months and are sector, segment and application specific.

TRC Ratio: The ratio of the present value of lifetime savings to the total measure cost, given the model's global inputs (such as avoided cost, discount rate and the assumed cost of carbon). The total measure cost includes both technology and program administrative costs.

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	NC	Space Heating	Conditioned Space Design (Central heat)	1%	96%	0	30	8%	-	L	0%	2.03
		Water Heating	New Construction, Improved Plumbing Desig	30%	5%	2	50	10%	0.00020	H	13%	0.96
		Space Cooling	New Construction, Sub-Slab Ventilation	100%	10%	2	30	60%	0.00333	H	13%	0.29
			Conditioned Space Design (Central AC)	65%	96%	2	30	8%	0.00333	L	0%	1.17
			Conditioned Space Design (heat pump)	1%	96%	0	15	8%	0.00333	L	0%	5.35
			Heat_Pump - Ground or Water-Source - Ope	1%	5%	0	27	28%	0.00333	M	5%	1.16
			Heat_Pump - Ground or Water-Source - Ope	1%	5%	0	27	30%	0.00333	M	5%	1.40
		Other	New Construction, Whole-house Electricity-U	100%	1%	19	7	5%	0.00014	M	5%	0.39
	Retrofit	Space Heating	Heating system fuel switch - Electric to Gas	1%	0%	17	40	100%	-	H	4%	0.26
			Radiant Barrier (Ceiling) -- Central Heat	1%	3%	15	30	3%	-	M	2%	1.23
		Water Heating	Drainwater Heat Recovery	30%	10%	99	14	4%	0.00020	H	4%	0.08
			Faucet aerator (3 per home)	21%	40%	30	9	15%	0.00020	M	2%	1.55
			Hot Water Demand Recirculation	25%	21%	106	15	4%	0.00020	H	4%	0.21
			Low Flow Showerhead	25%	10%	53	9	15%	0.00020	M	2%	3.31
			Shower Controls (Shower Start Technology)	25%	0%	42	10	10%	0.00020	M	2%	1.02
			Water Heater Blanket	25%	25%	83	10	7%	0.00020	M	2%	5.37
			Hot Water Pipe Insulation	25%	52%	83	10	4%	0.00020	M	2%	0.41
			Direct load control of water heaters	25%	0%	83	12	37%	0.00020	L	1%	1.95
			Solar Hot Water	25%	2%	83	15	50%	0.00020	M	2%	0.11
			Water Heater Setback	25%	93%	83	5	3%	0.00020	L	1%	10.09
		Space Cooling	CAC Tune-Up	65%	25%	201	10	5%	0.00333	H	4%	0.79
			Room A/C Turn In	1%	0%	1	9	100%	0.00333	L	1%	8.50

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	Retrofit	Space Cooling	Whole House Fan	73%	20%	101	10	5%	0.00333	M	2%	0.29
			Direct load control of air conditioners	65%	0%	201	12	10%	0.00333	L	1%	1.69
			Radiant Barrier (Ceiling) -- Central AC	65%	3%	201	30	12%	0.00333	M	2%	3.59
			Radiant Barrier (Ceiling) -- Room AC	1%	3%	2	30	12%	0.00333	M	2%	2.20
			Air Source Heat_Pump 14 SEER, 8.5 HSPF	1%	5%	14	15	5%	0.00333	M	2%	3.13
			Air Source Heat_Pump 16 SEER, 8.8 HSPF	1%	5%	14	17	13%	0.00333	M	2%	2.39
			Air Source Heat_Pump 18 SEER, 9.0 HSPF	1%	5%	14	17	19%	0.00333	M	2%	2.09
			Desuperheater for central air conditioner (AS	1%	10%	3	10	30%	0.00333	M	2%	1.74
			Radiant Barrier (Ceiling) -- Heat pump	1%	3%	5	30	12%	0.00333	M	2%	4.48
		Dehumidifier	Whole-House Dehumidifier	64%	5%	199	11	6%	0.00050	M	2%	0.06
		HVAC Electricity	ECM Blower Retrofit for Furnace	75%	15%	102	15	35%	0.00038	M	2%	0.43
		Lighting, In-unit	High Efficiency Lighting Fixtures	25%	25%	218	14	66%	0.00007	L	1%	1.55
			Occupancy Sensors	100%	15%	231	10	5%	0.00007	L	1%	0.22
		Lighting, Exterior	Exterior Lighting Controls	85%	15%	46	12	50%	-	H	4%	1.01
			LED Exterior Lighting	85%	0%	57	15	18%	-	L	1%	0.09
		Lighting, Holiday	LED Holiday Lighting	75%	15%	1	9	86%	-	H	4%	0.35
		Refrigerator	Second Refrigerator Turn In	37%	15%	25	5	100%	0.00007	O	1%	0.41
		Freezer	Second Freezer Turn In	5%	15%	4	5	100%	0.00007	O	4%	0.76
		Other Peripheral Elec	Smart Power Strip	100%	25%	29	5	37%	0.00014	M	2%	0.28
		Other	Whole House Green Switch	100%	0%	1,210	12	5%	0.00014	M	2%	0.19
			Whole-house Electricity-Use Feedback Displ	100%	1%	1,210	7	4%	0.00014	L	1%	0.63
	ROB	Clothes Dryer	Dryer Fuel Switch	70%	0%	8	12	100%	0.00027	L	0%	1.60
			Dryer With Moisture Sensor	96%	15%	9	12	14%	0.00027	H	13%	0.46
			Heat Pump Clothes Dryer	74%	0%	6	15	40%	0.00027	L	0%	0.61
		Water Heating	Efficient Electric Water Heater	30%	8%	9	13	3%	0.00020	H	13%	0.46
			Energy Star Clothes Washer (w/ Elec. WH &	26%	17%	4	14	40%	0.00020	O	10%	1.51
			Energy Star Clothes Washer (w/ Elec. WH &	1%	17%	0	14	60%	0.00020	O	10%	1.26
			Energy Star Dishwasher (Electric Water Hea	13%	22%	1	12	29%	0.00020	L	0%	2.70
			Heat Pump Water Heater	25%	2%	5	20	54%	0.00020	O	5%	1.01
			Water Heater fuel switch	11%	0%	4	15	100%	0.00020	O	1%	0.34
		Space Cooling	2-Stage Central AC	65%	15%	13	20	30%	0.00333	H	13%	1.47
			Ceiling Fan Efficiency Upgrade	63%	40%	3	10	20%	0.00333	M	5%	1.07

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	ROB	Space Cooling	Cool Roof	65%	2%	75	15	3%	0.00333	M	5%	0.03
			Ductless mini-split Equipment Upgrade	10%	1%	1	14	30%	0.00333	O	10%	0.25
			Energy Star Room A/C	18%	25%	3	9	9%	0.00333	M	5%	0.81
			High Efficiency Central AC (Tier 1)	65%	8%	10	20	6%	0.00333	O	15%	0.83
			High Efficiency Central AC (Tier 2)	65%	8%	10	20	13%	0.00333	O	15%	0.94
			Air Conditioner - Central - Proper sizing	65%	15%	17	15	3%	0.00333	L	1%	19.44
		Dehumidifier	Energy Star Dehumidifer	64%	91%	5	12	22%	0.00050	L	0%	2.64
		HVAC Electricity	ECM Furnace	95%	5%	7	15	75%	0.00038	O	25%	3.26
		Lighting, In-unit	CFL Bulbs, purchased replacement (2012)	100%	20%	140	6	66%	0.00007	O	20%	2.40
			LED Bulbs, purchased replacement (2012)	100%	1%	140	20	84%	0.00007	O	10%	1.33
			LED Bulbs, purchased replacement (2018)	100%	1%	16	30	77%	0.00007	O	0%	1.41
		Refrigerator	Energy Star Compliant Side-by-Side Refrige	20%	18%	1	19	20%	0.00007	O	20%	0.42
			Energy Star Compliant Top-Mount Refrigerat	90%	18%	4	19	20%	0.00007	O	20%	0.52
		Freezer	Energy Star Compliant Chest Freezer	36%	13%	1	20	10%	0.00007	H	13%	0.47
			Energy Star Compliant Upright Freezer (Mar	25%	13%	1	20	10%	0.00007	O	20%	0.54
		Range/Oven	Convection Oven	111%	15%	5	14	23%	0.00027	H	13%	0.09
			Induction Cooktop	113%	25%	7	12	50%	0.00027	H	13%	0.07
			Range/Oven Fuel Switch	40%	0%	4	15	100%	0.00027	L	0%	1.18
		Computer	Energy Star Compliant Personal Computer	72%	85%	2	7	25%	0.00014	L	0%	0.06
		Other Base Electroni	Home Electronics Efficiency Upgrade (Energ	100%	15%	7	8	25%	0.00014	M	5%	2.87

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RS	NC	Space Heating	Conditioned Space Design (Central heat)	5%	96%	0	30	8%	-	L	0%	1.89
		Water Heating	New Construction, Improved Plumbing Desig	25%	5%	0	50	10%	0.00020	H	6%	0.87
		Space Cooling	Conditioned Space Design (Central AC)	60%	96%	0	30	8%	0.00333	L	0%	1.12
	Retrofit	Space Heating	Heating system fuel switch - Electric to Gas	5%	0%	15	40	100%	-	H	2%	0.20
			Radiant Barrier (Ceiling) -- Central Heat	5%	3%	20	30	3%	-	M	1%	0.93
		Water Heating	Drainwater Heat Recovery	75%	5%	70	14	4%	0.00020	H	2%	0.07
			Faucet aerator (2 per home)	18%	40%	7	9	15%	0.00020	M	1%	1.76
			Hot Water Demand Recirculation	24%	21%	31	15	4%	0.00020	H	2%	0.29
			Low Flow Showerhead	24%	10%	16	9	15%	0.00020	M	1%	3.76
			Shower Controls (Shower Start Technology)	24%	0%	13	10	10%	0.00020	M	1%	0.97
			Water Heater Blanket	24%	31%	21	10	7%	0.00020	M	1%	4.88
			Hot Water Pipe Insulation	24%	63%	21	10	4%	0.00020	M	1%	0.40
			Direct load control of water heaters	24%	0%	21	12	46%	0.00020	L	0%	1.96
			Solar Hot Water	24%	2%	21	15	50%	0.00020	M	1%	0.09
			Water Heater Setback	24%	95%	21	5	3%	0.00020	L	0%	10.09
		Space Cooling	CAC Tune-Up	60%	100%	54	10	5%	0.00333	H	2%	0.93
			Room A/C Turn In	22%	0%	3	9	100%	0.00333	L	0%	7.50
			Whole House Fan	14%	20%	4	10	5%	0.00333	M	1%	0.29
			Direct load control of air conditioners	60%	0%	47	12	13%	0.00333	L	0%	1.69
			Radiant Barrier (Ceiling) -- Central AC	60%	3%	47	30	12%	0.00333	M	1%	2.57
			Radiant Barrier (Ceiling) -- Room AC	22%	3%	10	30	12%	0.00333	M	1%	1.53
			Desuperheater for central air conditioner (AS	1%	10%	1	10	30%	0.00333	M	1%	1.41
		Dehumidifier	Whole-House Dehumidifier	4%	5%	3	11	6%	0.00050	M	1%	0.05
		HVAC Electricity	ECM Blower Retrofit for Furnace	80%	5%	35	15	25%	0.00038	M	1%	0.32

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RS	Retrofit	Lighting, In-unit	High Efficiency Lighting Fixtures	25%	25%	54	14	66%	0.00007	L	0%	1.59
			Occupancy Sensors	100%	15%	63	10	5%	0.00007	L	0%	0.19
		Lighting, Exterior	Exterior Lighting Controls	25%	15%	4	12	50%	-	H	2%	0.92
			LED Exterior Lighting	25%	0%	4	15	26%	-	L	0%	0.16
		Lighting, Common-Ar	Common Area Lighting Improvements in Mul	25%	20%	10	7	66%	0.00007	H	10%	1.74
		Lighting, Exit	Exit Lighting Improvements in Multifamily	15%	20%	1	7	66%	0.00011	M	1%	8.26
		Lighting, Holiday	LED Holiday Lighting	60%	15%	0	9	86%	-	H	2%	0.29
		Refrigerator	Second Refrigerator Turn In	19%	15%	5	5	100%	0.00007	O	1%	0.59
		Freezer	Second Freezer Turn In	1%	15%	0	5	100%	0.00007	O	4%	0.75
		Other Peripheral Elec	Smart Power Strip	100%	25%	9	5	37%	0.00014	M	1%	0.40
		Other	Whole House Green Switch	100%	0%	391	12	5%	0.00014	M	1%	0.19
	ROB	Clothes Dryer	Dryer Fuel Switch	74%	0%	2	12	100%	0.00027	L	0%	1.38
			Dryer With Moisture Sensor	68%	15%	2	12	14%	0.00027	H	6%	0.40
			Heat Pump Clothes Dryer	74%	0%	1	15	40%	0.00027	L	0%	0.53
		Water Heating	Efficient Electric Water Heater	25%	8%	2	13	3%	0.00020	H	6%	0.38
			Energy Star Clothes Washer (w/ Elec. WH &	23%	10%	1	14	40%	0.00020	O	10%	1.51
			Energy Star Clothes Washer (w/ Elec. WH &	2%	10%	0	14	60%	0.00020	O	10%	1.26
			Energy Star Dishwasher (Electric Water Hea	24%	22%	0	12	52%	0.00020	L	0%	2.67
			Heat Pump Water Heater	24%	4%	1	20	54%	0.00020	O	3%	0.84
			Water Heater fuel switch	4%	0%	0	15	100%	0.00020	O	1%	0.33

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RS	ROB	Space Cooling	2-Stage Central AC	60%	15%	3	20	30%	0.00333	H	6%	1.15
			Ceiling Fan Efficiency Upgrade	10%	40%	0	10	20%	0.00333	M	3%	1.05
			Cool Roof	60%	2%	17	15	3%	0.00333	M	3%	0.03
			Ductless mini-split Equipment Upgrade	14%	1%	0	14	30%	0.00333	O	10%	0.18
			Energy Star Room A/C	15%	25%	1	9	9%	0.00333	M	3%	0.95
			High Efficiency Central AC (Tier 1)	60%	8%	2	20	6%	0.00333	O	8%	0.62
			High Efficiency Central AC (Tier 2)	60%	8%	2	20	13%	0.00333	O	8%	1.10
			Air Conditioner - Central - Proper sizing	60%	15%	4	15	3%	0.00333	L	0%	18.62
		Dehumidifier	Energy Star Dehumidifer	4%	91%	0	12	13%	0.00050	L	0%	1.26
		HVAC Electricity	ECM Furnace	95%	5%	2	15	75%	0.00038	O	13%	2.81
		Lighting, In-unit	CFL Bulbs, purchased replacement (2012)	100%	15%	23	6	66%	0.00007	O	20%	2.40
			LED Bulbs, purchased replacement (2012)	100%	1%	23	20	84%	0.00007	O	10%	1.29
			LED Bulbs, purchased replacement (2018)	100%	1%	2	30	77%	0.00007	O	0%	1.29
		Refrigerator	Energy Star Compliant Side-by-Side Refrige	8%	15%	0	19	20%	0.00007	O	20%	0.59
			Energy Star Compliant Top-Mount Refrigerat	92%	15%	1	19	20%	0.00007	O	20%	0.73
		Freezer	Energy Star Compliant Chest Freezer	10%	7%	0	20	10%	0.00007	H	6%	0.65
			Energy Star Compliant Upright Freezer (Mar	7%	7%	0	20	10%	0.00007	O	20%	0.74
		Range/Oven	Convection Oven	105%	15%	1	14	23%	0.00027	H	6%	0.09
			Induction Cooktop	102%	25%	2	12	50%	0.00027	H	6%	0.07
			Range/Oven Fuel Switch	50%	0%	1	15	100%	0.00027	L	0%	0.90
		Computer	Energy Star Compliant Personal Computer	72%	85%	1	7	25%	0.00014	L	0%	0.06
		Other Base Electroni	Home Electronics Efficiency Upgrade (Energ	100%	15%	2	8	25%	0.00014	M	3%	2.83

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	NC	Space Heating	Conditioned Space Design (Central heat)	10%	96%	0	30	8%	-	L	0%	1.64
		Water Heating	New Construction, Improved Plumbing Desig	20%	5%	0	50	20%	0.00020	H	6%	2.23
		Space Cooling	Conditioned Space Design (Central AC)	56%	96%	0	30	8%	0.00333	L	0%	1.05
	Retrofit	Space Heating	Heating system fuel switch - Electric to Gas	10%	0%	12	40	100%	-	H	2%	0.19
			Radiant Barrier (Ceiling) -- Central Heat	10%	3%	19	30	3%	-	M	1%	0.66
		Water Heating	Drainwater Heat Recovery	25%	8%	13	14	4%	0.00020	H	2%	0.06
			Faucet aerator (2 per home)	24%	40%	4	9	15%	0.00020	M	1%	1.33
			Hot Water Demand Recirculation	23%	21%	14	15	4%	0.00020	H	2%	1.49
			Low Flow Showerhead	23%	10%	7	9	15%	0.00020	M	1%	3.03
			Shower Controls (Shower Start Technology)	23%	0%	6	10	10%	0.00020	M	1%	0.76
			Water Heater Blanket	23%	37%	9	10	7%	0.00020	M	1%	4.23
			Hot Water Pipe Insulation	23%	75%	9	10	4%	0.00020	M	1%	0.37
			Direct load control of water heaters	23%	0%	9	12	61%	0.00020	L	0%	1.95
			Solar Hot Water	23%	2%	9	15	50%	0.00020	M	1%	0.07
			Water Heater Setback	23%	87%	9	5	3%	0.00020	L	0%	10.09
		Space Cooling	CAC Tune-Up	56%	25%	19	10	5%	0.00333	H	2%	0.43
			Room A/C Turn In	3%	0%	0	9	100%	0.00333	L	0%	10.67
			Direct load control of air conditioners	56%	0%	19	12	19%	0.00333	L	0%	1.69
			Radiant Barrier (Ceiling) -- Central AC	56%	3%	19	30	12%	0.00333	M	1%	1.67
			Radiant Barrier (Ceiling) -- Room AC	3%	3%	1	30	12%	0.00333	M	1%	0.97

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	Retrofit	Dehumidifier	Whole-House Dehumidifier	4%	5%	1	11	6%	0.00050	M	1%	0.03
		HVAC Electricity	ECM Blower Retrofit for Furnace	15%	5%	3	15	25%	0.00038	M	1%	0.25
		Lighting, In-unit	High Efficiency Lighting Fixtures	25%	25%	18	14	66%	0.00007	L	0%	1.36
			Occupancy Sensors	100%	15%	31	10	5%	0.00007	L	0%	0.15
		Lighting, Exterior	Exterior Lighting Controls	75%	15%	2	12	50%	-	H	2%	0.25
			LED Exterior Lighting	75%	0%	8	15	18%	-	L	0%	0.77
		Lighting, Common-Ar	Common Area Lighting Improvements in Mul	95%	75%	12	7	40%	0.00007	H	10%	8.48
		Lighting, Exit	Exit Lighting Improvements in Multifamily	95%	75%	2	7	30%	0.00011	M	1%	9.07
		Lighting, Holiday	LED Holiday Lighting	50%	15%	0	9	86%	-	H	2%	0.18
		Refrigerator	Second Refrigerator Turn In	1%	15%	0	5	100%	0.00007	O	1%	0.41
		Freezer	Second Freezer Turn In	0%	15%	-	5	100%	0.00007	L	0%	0.53
		Other Peripheral Elec	Smart Power Strip	100%	25%	6	5	37%	0.00014	M	1%	2.08
		Other	Whole House Green Switch	100%	0%	140	12	5%	0.00014	M	1%	0.11
	ROB	Clothes Dryer	Dryer Fuel Switch	74%	0%	1	12	100%	0.00027	L	0%	0.51
			Dryer With Moisture Sensor	40%	15%	1	12	14%	0.00027	H	6%	0.35
			Heat Pump Clothes Dryer	74%	0%	0	15	40%	0.00027	L	0%	0.26
		Water Heating	Efficient Electric Water Heater	20%	8%	1	13	3%	0.00020	H	6%	0.28
			Energy Star Clothes Washer (w/ Elec. WH &	23%	5%	0	14	40%	0.00020	O	10%	2.55
			Energy Star Clothes Washer (w/ Elec. WH &	2%	5%	0	14	60%	0.00020	O	10%	2.41
			Energy Star Dishwasher (Electric Water Hea	32%	22%	0	12	29%	0.00020	L	0%	1.15
			Heat Pump Water Heater	23%	6%	1	20	54%	0.00020	O	3%	0.64
			Water Heater fuel switch	5%	0%	0	15	100%	0.00020	O	1%	0.26
		Space Cooling	2-Stage Central AC	56%	15%	1	20	30%	0.00333	H	6%	0.81

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	ROB	Space Cooling	Ceiling Fan Efficiency Upgrade	6%	40%	0	10	20%	0.00333	M	3%	1.07

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	ROB	Space Cooling	Cool Roof	56%	2%	6	15	3%	0.00333	M	3%	0.02
			Ductless mini-split Equipment Upgrade	70%	1%	1	14	30%	0.00333	O	10%	0.12
			Energy Star Room A/C	12%	25%	0	9	9%	0.00333	M	3%	4.65
			High Efficiency Central AC (Tier 1)	56%	8%	1	20	5%	0.00333	O	8%	0.42
			High Efficiency Central AC (Tier 2)	56%	8%	1	20	13%	0.00333	O	8%	4.93
			Air Conditioner - Central - Proper sizing	56%	15%	2	15	3%	0.00333	L	0%	17.24
		Dehumidifier	Energy Star Dehumidifer	4%	91%	0	12	13%	0.00050	L	0%	1.28
		HVAC Electricity	ECM Furnace	96%	5%	1	15	75%	0.00038	O	13%	2.29
		Lighting, In-unit	CFL Bulbs, purchased replacement (2012)	100%	15%	11	6	66%	0.00007	O	20%	2.24
			LED Bulbs, purchased replacement (2012)	100%	1%	11	20	84%	0.00007	O	10%	1.30
			LED Bulbs, purchased replacement (2018)	100%	1%	1	30	77%	0.00007	O	0%	1.21
		Refrigerator	Energy Star Compliant Side-by-Side Refrige	2%	15%	0	19	20%	0.00007	O	20%	2.35
			Energy Star Compliant Top-Mount Refrigerat	98%	15%	1	19	20%	0.00007	O	20%	2.11
		Freezer	Energy Star Compliant Chest Freezer	4%	7%	0	20	10%	0.00007	O	20%	2.36
			Energy Star Compliant Upright Freezer (Mar	3%	7%	0	20	10%	0.00007	O	20%	2.57
		Range/Oven	Convection Oven	100%	15%	1	14	23%	0.00027	H	6%	0.09
			Induction Cooktop	99%	25%	1	12	50%	0.00027	H	6%	0.07
			Range/Oven Fuel Switch	15%	0%	0	15	100%	0.00027	L	0%	0.65
		Computer	Energy Star Compliant Personal Computer	72%	85%	0	7	25%	0.00014	L	0%	0.06
		Other Base Electroni	Home Electronics Efficiency Upgrade (Energ	100%	15%	2	8	25%	0.00014	M	3%	2.87

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
MH	NC	Space Heating	Conditioned Space Design (Central heat)	3%	96%	0	30	8%	-	L	0%	2.09
		Space Cooling	Conditioned Space Design (Central AC)	75%	96%	0	30	8%	0.00333	L	0%	1.28
	Retrofit	Space Heating	Heating system fuel switch - Electric to Gas	3%	0%	3	40	100%	-	H	4%	0.22
			Radiant Barrier (Ceiling) -- Central Heat	3%	3%	3	30	3%	-	M	2%	0.90
		Water Heating	Faucet aerator (2 per home)	43%	40%	3	9	15%	0.00020	M	2%	1.76
			Hot Water Demand Recirculation	45%	21%	13	15	4%	0.00020	H	4%	0.21
			Low Flow Showerhead	45%	10%	7	9	15%	0.00020	M	2%	3.31
			Shower Controls (Shower Start Technology)	45%	0%	5	10	10%	0.00020	M	2%	1.02
			Water Heater Blanket	45%	14%	9	10	7%	0.00020	M	2%	5.04
			Hot Water Pipe Insulation	45%	78%	9	10	4%	0.00020	M	2%	0.52
			Direct load control of water heaters	45%	0%	9	12	43%	0.00020	L	1%	1.96
			Solar Hot Water	45%	2%	9	15	50%	0.00020	M	2%	0.09
			Water Heater Setback	45%	89%	9	5	3%	0.00020	L	1%	10.09
		Space Cooling	CAC Tune-Up	75%	25%	13	10	5%	0.00333	H	4%	0.63
			Room A/C Turn In	14%	0%	1	9	100%	0.00333	L	1%	8.50
			Direct load control of air conditioners	75%	0%	13	12	13%	0.00333	L	1%	1.70
			Radiant Barrier (Ceiling) -- Central AC	75%	3%	13	30	12%	0.00333	M	2%	2.29
			Radiant Barrier (Ceiling) -- Room AC	14%	3%	1	30	12%	0.00333	M	2%	1.34
		Dehumidifier	Whole-House Dehumidifier	25%	5%	4	11	6%	0.00050	M	2%	0.05
		HVAC Electricity	ECM Blower Retrofit for Furnace	80%	0%	5	15	25%	0.00038	M	2%	0.19
		Lighting, In-unit	High Efficiency Lighting Fixtures	25%	25%	12	14	66%	0.00007	L	1%	1.40
			Occupancy Sensors	100%	15%	11	10	5%	0.00007	L	1%	0.16
		Lighting, Exterior	Exterior Lighting Controls	85%	15%	3	12	50%	-	H	4%	0.92
			LED Exterior Lighting	85%	0%	4	15	7%	-	L	1%	0.04
		Lighting, Holiday	LED Holiday Lighting	75%	15%	0	9	86%	-	H	4%	0.35
		Refrigerator	Second Refrigerator Turn In	6%	15%	0	5	100%	0.00007	O	1%	0.46
		Freezer	Second Freezer Turn In	1%	15%	0	5	100%	0.00007	O	4%	0.73
		Other Peripheral Elec	Smart Power Strip	100%	25%	2	5	37%	0.00014	M	2%	0.28
		Other	Whole House Green Switch	100%	0%	77	12	5%	0.00014	M	2%	0.17
			Whole-house Electricity-Use Feedback Displ	100%	1%	68	7	4%	0.00014	L	1%	0.54

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
MH	ROB	Clothes Dryer	Dryer Fuel Switch	70%	0%	0	12	100%	0.00027	L	0%	1.37
			Dryer With Moisture Sensor	93%	15%	1	12	14%	0.00027	H	13%	0.39
			Heat Pump Clothes Dryer	62%	0%	0	15	40%	0.00027	L	0%	0.47
		Water Heating	Efficient Electric Water Heater	60%	8%	1	13	3%	0.00020	H	13%	0.40
			Energy Star Clothes Washer (w/ Elec. WH &	28%	17%	0	14	40%	0.00020	O	10%	1.51
			Energy Star Clothes Washer (w/ Elec. WH &	1%	17%	0	14	60%	0.00020	O	10%	1.26
			Energy Star Dishwasher (Electric Water Hea	27%	22%	0	13	29%	0.00020	L	0%	2.79
			Heat Pump Water Heater	45%	0%	1	20	54%	0.00020	O	5%	0.89
			Water Heater fuel switch	9%	0%	0	15	100%	0.00020	O	1%	0.34
		Space Cooling	2-Stage Central AC	75%	15%	1	20	30%	0.00333	H	13%	1.17
			Ceiling Fan Efficiency Upgrade	44%	40%	0	10	20%	0.00333	M	5%	1.07
			Cool Roof	75%	2%	4	15	3%	0.00333	M	5%	0.03
			Ductless mini-split Equipment Upgrade	44%	1%	0	14	30%	0.00333	O	10%	0.22

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
MH	ROB	Space Cooling	Energy Star Room A/C	8%	25%	0	9	9%	0.00333	M	5%	0.65
			High Efficiency Central AC (Tier 1)	75%	8%	1	20	6%	0.00333	O	15%	0.66
			High Efficiency Central AC (Tier 2)	75%	8%	1	20	13%	0.00333	O	15%	0.76
			Air Conditioner - Central - Proper sizing	75%	15%	1	15	3%	0.00333	L	1%	18.69
		Dehumidifier	Energy Star Dehumidifer	25%	91%	0	12	13%	0.00050	L	0%	1.28
		HVAC Electricity	ECM Furnace	96%	5%	0	15	75%	0.00038	O	25%	2.93
		Lighting, In-unit	CFL Bulbs, purchased replacement (2012)	100%	15%	7	6	66%	0.00007	O	20%	2.32
			LED Bulbs, purchased replacement (2012)	100%	1%	7	20	84%	0.00007	O	10%	1.33
			LED Bulbs, purchased replacement (2018)	100%	1%	1	30	77%	0.00007	O	0%	1.21
		Refrigerator	Energy Star Compliant Side-by-Side Refrige	12%	15%	0	19	20%	0.00007	O	20%	0.42
			Energy Star Compliant Top-Mount Refrigerat	85%	15%	0	19	20%	0.00007	O	20%	0.52
		Freezer	Energy Star Compliant Chest Freezer	23%	5%	0	20	10%	0.00007	H	13%	0.47
			Energy Star Compliant Upright Freezer (Mar	17%	5%	0	20	10%	0.00007	O	20%	0.54
		Range/Oven	Convection Oven	102%	15%	0	14	23%	0.00027	H	13%	0.09
			Induction Cooktop	100%	25%	0	12	50%	0.00027	H	13%	0.07
			Range/Oven Fuel Switch	25%	0%	0	15	100%	0.00027	L	0%	0.66
		Computer	Energy Star Compliant Personal Computer	47%	85%	0	7	25%	0.00014	L	0%	0.06
		Other Base Electroni	Home Electronics Efficiency Upgrade (Energ	100%	15%	1	8	25%	0.00014	M	5%	2.87

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	2%	2%	2	50	25%	O	10.0%	1.35
			New Construction (Energy Star) - Gas or LP Heat	2%	2%	2	50	10%	O	15.0%	1.20
			New Construction (Passivhaus level) -Gas or LP H	2%	2%	2	50	80%	O	2.0%	0.89
			Conditioned Space Design (Central heat)	64%	3%	54	30	8%	L	0.0%	2.69
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	67%	21	50	15%	H	12.5%	0.96
	Retrofit	Space Heating	Boiler Controls-Gas	10%	8%	738	10	5%	M	1.6%	0.81
			Energy Efficient Windows	80%	20%	5,579	25	0%	L	0.5%	0.01
			Heat Recovery Ventilator	1%	0%	74	20	13%	M	1.6%	0.59
			HVAC Tune-Up (Gas Heat)	80%	40%	5,905	5	1%	M	2%	0.19
			Programmable Thermostats - gas boiler	10%	6%	852	15	12%	L	0.5%	12.41
			Programmable Thermostats - gas furnace	70%	41%	4,825	15	12%	L	1%	11.02
			Shell upgrades during remodeling	80%	60%	5,905	40	10%	M	1.6%	0.79
			Storm Windows	27%	1%	1,968	20	12%	M	0.5%	0.65
			Zoning controls	70%	67%	2,804	12	7%	L	1%	0.41
			Duct Sealing (Outside Conditioned Space)- gas	10%	7%	689	10	3%	L	1%	0.54
			Radiant Barrier (Ceiling)	65%	63%	4,446	30	3%	M	1.6%	1.67
		Water Heating	Drainwater heat recovery	70%	63%	1,322	30	16%	H	3.8%	0.65
			Hot Water Demand Recirulation	70%	70%	1,322	15	5%	H	4%	0.20
			Low Flow Showerhead (w/ Gas DHW)	70%	18%	1,322	10	15%	M	1.6%	4.38
			Pipe Wrap - gas DHW	70%	36%	1,322	15	4%	M	2%	0.68
			Shower controls	70%	70%	484	10	10%	M	2%	0.95
			Water heater tank wrap - Gas	28%	20%	529	10	7%	M	2%	8.91
			Solar Hot Water (SHW)	25%	25%	468	15	50%	M	2%	0.13
			Water_Heater Thermostat Setback	25%	0%	468	5	3%	L	0.5%	22.05
			Desuperheater for central air conditioner (ASHP) s	25%	23%	472	10	30%	M	1.6%	0.72
			Faucet aerator (Gas DHW) (3 per home)	53%	24%	277	9	15%	M	2%	1.35
		Wx	Weatherization/direct install (High gas usage)	20%	15%	2,491	40	20%	O	1.5%	0.90
			Weatherization/direct install (Low gas usage)	20%	8%	923	40	10%	O	2%	0.81
			Weatherization/direct install (Medium gas usage)	40%	26%	2,952	40	15%	O	2%	0.92

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
SF	ROB	Clothes Dryer	Modulating Gas Dryer	25%	25%	11	11	20%	H	12.5%	0.22
		Space Heating	Cold Climate Heat Pump	80%	80%	387	20	100%	O	10.0%	0.38
			Dual Fuel Heat Pump	10%	10%	53	18	40%	O	10%	1.34
			Gas Absorption Heat Pump - Nat Gas	80%	80%	387	20	51%	O	0.0%	0.91
			Ground Source Heat Pump	80%	76%	387	20	100%	O	10.0%	1.05
			High Efficiency Boiler w/ indirect DHW	10%	10%	51	20	15%	M	5.0%	1.07
			High Efficiency Furnace - Natural Gas	70%	17%	356	20	12%	O	1.0%	2.08
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	48%	40%	17	11	45%	O	10.0%	1.12
			Energy Star Clothes Washer (w/ Gas WH & Gas D	24%	20%	19	11	35%	O	10%	1.04
			Energy Star Dishwasher (w/Gas DHW)	46%	14%	80	13	4%	L	0.0%	2.20
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	70%	121	13	26%	O	10.0%	0.85
			Heat pump water heater replacement for gas water	70%	69%	102	20	100%	O	2.5%	1.47
			High Efficiency Water Heater - Natural Gas (EF=0.	2%	2%	3	13	5%	O	10.0%	1.58
			High Efficiency Water Heater - Natural Gas (EF=0.	0%	0%	-	13	12%	O	10%	1.07
			Indirect-fired domestic water heater - NG boiler w/	15%	15%	19	20	28%	M	5.0%	0.81
			Whole-House Tankless Water Heater (Gas or LP)	70%	69%	87	20	40%	O	5%	1.32

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RS	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	0%	0%	-	50	25%	O	5%	1.14
			New Construction (Energy Star) - Gas or LP Heat	0%	0%	-	50	10%	O	7.5%	1.37
			New Construction (Passivhaus level) -Gas or LP H	0%	0%	-	50	80%	O	1.0%	0.57
			Conditioned Space Design (Central heat)	4%	0%	1	30	8%	L	0.0%	2.45
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	67%	5	50	15%	H	6.3%	0.80
	Retrofit	Space Heating	Boiler Controls-Gas	5%	4%	104	10	11%	M	0.8%	2.25
			Energy Efficient Windows	65%	16%	1,112	25	0%	L	0.3%	0.02
			HVAC Tune-Up (Gas Heat)	92%	50%	1,909	5	1%	M	0.8%	0.17
			Programmable Thermostats - gas boiler	5%	3%	115	15	12%	L	0.3%	11.86
			Programmable Thermostats - gas furnace	85%	57%	1,428	15	12%	L	0%	10.09
			Shell upgrades during remodeling	80%	60%	1,725	40	10%	M	0.8%	0.84
			Storm Windows	65%	7%	1,349	20	12%	M	0.5%	0.60
			Duct Sealing (Outside Conditioned Space)- gas	15%	11%	252	10	3%	L	0.3%	0.40
			Radiant Barrier (Ceiling)	60%	58%	1,013	30	3%	M	0.8%	1.18
		Water Heating	Drainwater heat recovery	70%	65%	332	30	16%	H	1.9%	0.53
			Hot Water Demand Recirulation	70%	70%	332	15	5%	H	2%	0.16
			Low Flow Showerhead (w/ Gas DHW)	70%	28%	332	10	15%	M	0.8%	4.62
			Pipe Wrap - gas DHW	70%	20%	332	15	4%	M	1%	0.64
			Shower controls	70%	70%	151	10	10%	M	1%	0.13
			Water heater tank wrap - Gas	28%	23%	133	10	7%	M	1%	7.87
			Solar Hot Water (SHW)	24%	24%	113	15	50%	M	1%	0.11
			Water_Heater Thermostat Setback	24%	0%	113	5	3%	L	0.3%	22.05
			Faucet aerator (Gas DHW) (2 per home)	53%	24%	31	9	15%	M	0.8%	0.74
			Desuperheater for central air conditioner (ASHP) s	24%	22%	114	10	30%	M	1%	0.59
		Wx	Weatherization/direct install (High gas usage)	23%	17%	711	40	20%	O	1.5%	1.14
			Weatherization/direct install (Low gas usage)	23%	9%	259	40	10%	O	2%	0.82
			Weatherization/direct install (Medium gas usage)	45%	29%	905	40	15%	O	2%	1.01
	ROB	Clothes Dryer	Modulating Gas Dryer	10%	10%	1	11	20%	H	6.3%	0.17
		Space Heating	Cold Climate Heat Pump	85%	85%	116	20	100%	O	5.0%	0.40
			Dual Fuel Heat Pump	85%	84%	126	18	40%	O	5%	1.12
			Efficient Steam Boiler (MF) - gas	3%	3%	3	25	9%	M	2.5%	1.73
			Ground Source Heat Pump	85%	84%	116	20	100%	O	5.0%	1.04
			High Efficiency Boiler w/ indirect DHW	5%	4%	7	20	15%	M	2.5%	1.31
			High Efficiency Furnace - Natural Gas	85%	72%	116	20	12%	O	1.0%	2.61
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	51%	46%	4	11	45%	O	10.0%	1.10
			Energy Star Dishwasher (w/Gas DHW)	35%	6%	15	13	4%	L	0.0%	1.81
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	68%	30	13	26%	O	10.0%	0.69
			Heat pump water heater replacement for gas water	70%	70%	29	20	100%	O	1.3%	1.40
			High Efficiency Water Heater - Natural Gas (EF=0.	3%	3%	1	13	5%	O	10.0%	1.28
			High Efficiency Water Heater - Natural Gas (EF=0.	3%	3%	1	13	12%	O	10%	0.87
			Indirect-fired domestic water heater - NG boiler w/	5%	5%	2	20	28%	M	2.5%	0.67
			Whole-House Tankless Water Heater (Gas or LP)	70%	69%	22	20	40%	O	5.0%	1.08

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
RL	NC	Space Heating	New Construction (beyond Energy Star) - Gas or L	0%	0%	-	50	25%	O	5%	0.61
			New Construction (Energy Star) - Gas or LP Heat	0%	0%	-	50	10%	O	7.5%	1.20
			New Construction (Passivhaus level) -Gas or LP H	0%	0%	-	50	80%	O	1.0%	0.28
			Conditioned Space Design (Central heat)	4%	0%	0	30	8%	L	0.0%	2.05
		Water Heating	Improved Plumbing Layout - Gas Heat	70%	67%	2	50	15%	H	6.3%	0.61
	Retrofit	Space Heating	Boiler Controls-Gas	50%	30%	269	10	11%	M	0.8%	6.88
			Energy Efficient Windows	80%	20%	489	25	0%	L	0.3%	0.02
			Heat Recovery Ventilator - Buildings that exhaust h	30%	24%	162	20	7%	M	0.8%	0.53
			HVAC Tune-Up (Gas Heat)	70%	35%	377	5	1%	M	1%	0.09
			Mainline Air vent (MF) - gas	10%	8%	54	30	8%	M	1%	4.31
			Programmable Thermostats - gas boiler	50%	37%	475	15	12%	L	0.3%	11.16
			Programmable Thermostats - gas furnace	15%	11%	89	15	12%	L	0%	8.68
			Shell upgrades during remodeling	65%	13%	368	40	10%	M	0.8%	0.88
			Storm Windows	50%	10%	269	20	12%	M	0.5%	0.32
			Thermostatic vents (MF) - gas	10%	5%	54	20	5%	M	0.8%	0.89
			Duct Sealing (Outside Conditioned Space)- gas	1%	1%	4	10	5%	L	0.3%	0.49
			Radiant Barrier (Ceiling)	56%	54%	332	30	3%	M	0.8%	0.77
		Water Heating	Drainwater heat recovery	70%	67%	123	30	16%	H	1.9%	0.40
			Low Flow Showerhead (w/ Gas DHW)	70%	18%	123	10	15%	M	0.8%	5.08
			Pipe Wrap - gas DHW	70%	36%	123	15	4%	M	1%	0.57
			Shower controls	70%	70%	66	10	10%	M	1%	5.14
			Water heater tank wrap - Gas	7%	5%	12	10	7%	M	1%	6.58
			Solar Hot Water (SHW)	23%	23%	40	15	50%	M	1%	0.08
			Water_Heater Thermostat Setback	23%	0%	40	5	3%	L	0.3%	22.05
			Faucet aerator (Gas DHW) (2 per home)	53%	24%	10	9	15%	M	0.8%	0.50
		Wx	Weatherization/direct install (High gas usage)	18%	4%	149	40	15%	O	1.5%	0.89
			Weatherization/direct install (Low gas usage)	18%	2%	50	40	5%	O	2%	0.76
			Weatherization/direct install (Medium gas usage)	35%	5%	198	40	10%	O	2%	0.86

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RL	ROB	Clothes Dryer	Modulating Gas Dryer	10%	10%	0	11	20%	H	6.3%	0.11
		Space Heating	Cold Climate Heat Pump	15%	15%	5	20	100%	O	5.0%	0.22
			Dual Fuel Heat Pump	15%	15%	6	18	40%	O	5%	0.62
			Efficient Steam Boiler (MF) - gas	10%	9%	3	25	2%	M	2.5%	0.23
			Ground Source Heat Pump	15%	15%	5	20	100%	O	5.0%	0.57
			High Efficiency Boiler w/ indirect DHW	40%	36%	14	20	15%	M	2.5%	0.72
			High Efficiency Furnace - Natural Gas	15%	9%	5	20	12%	O	1.0%	1.53
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	51%	48%	1	11	45%	O	10.0%	2.21
			Energy Star Clothes Washer (w/ Gas WH & Gas D	9%	8%	1	11	35%	O	10%	1.03
					9%	0	11	35%	O	10%	1.99
			Energy Star Dishwasher (w/Gas DHW)	35%	11%	6	13	4%	L	0.0%	1.40
			Gas-Condensing Water Heater - Natural Gas (EF=	70%	68%	11	13	26%	O	10.0%	0.52
			Heat pump water heater replacement for gas water	70%	70%	11	20	100%	O	1.3%	1.11
			High Efficiency Water Heater - Natural Gas (EF=0.	3%	3%	0	13	5%	O	10.0%	0.94
			High Efficiency Water Heater - Natural Gas (EF=0.	3%	3%	0	13	12%	O	10%	0.65
			Indirect-fired domestic water heater - NG boiler w/	50%	49%	6	20	28%	M	2.5%	2.16
			Whole-House Tankless Water Heater (Gas or LP)	70%	68%	8	20	40%	O	5.0%	0.82

Segment	Market	End Use	Measure	Base Saturation (% of Housing Units Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Measure Useful Life (yrs)	Technical Savngs Rate (%)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
MH	NC	Space Heating	Conditioned Space Design (Central heat)	25%	1%	1	30	8%	L	0.0%	2.83
	Retrofit	Space Heating	Energy Efficient Windows	80%	20%	435	25	1%	L	0.5%	0.04
			HVAC Tune-Up (Gas Heat)	90%	34%	548	5	1%	M	1.6%	0.16
			Programmable Thermostats - gas furnace	90%	77%	489	15	12%	L	0.5%	10.38
			Shell upgrades during remodeling	80%	60%	487	40	10%	M	1.6%	0.70
			Storm Windows	0%	0%	-	20	5%	M	0.5%	0.87
			Duct Sealing (Outside Conditioned Space)- gas	90%	65%	489	10	15%	L	1%	2.27
			Radiant Barrier (Ceiling)	75%	73%	408	30	3%	M	1.6%	1.08
		Water Heating	Hot Water Demand Recirulation	40%	40%	44	15	5%	H	3.8%	0.12
			Low Flow Showerhead (w/ Gas DHW)	40%	10%	44	10	15%	M	1.6%	5.14
			Pipe Wrap - gas DHW	40%	13%	44	15	4%	M	2%	0.57
			Shower controls	40%	40%	26	10	10%	M	2%	0.95
			Water heater tank wrap - Gas	16%	11%	18	10	7%	M	2%	6.65
			Solar Hot Water (SHW)	45%	44%	49	15	50%	M	2%	0.08
			Water_Heater Thermostat Setback	45%	0%	49	5	3%	L	0.5%	22.05
			Faucet aerator (Gas DHW) (2 per home)	30%	14%	5	9	15%	M	1.6%	0.74
		Wx	Weatherization/direct install (High gas usage)	20%	15%	217	40	20%	O	1.5%	0.90
			Weatherization/direct install (Low gas usage)	20%	13%	78	40	10%	O	2%	0.79
			Weatherization/direct install (Medium gas usage)	40%	16%	243	40	15%	O	2%	0.98
	ROB	Clothes Dryer	Modulating Gas Dryer	30%	30%	1	11	20%	H	12.5%	0.17
		Space Heating	Cold Climate Heat Pump	90%	90%	36	20	100%	O	10.0%	0.39
			Dual Fuel Heat Pump	90%	89%	39	18	40%	O	10%	1.09
			Ground Source Heat Pump	90%	89%	36	20	100%	O	10%	1.02
			High Efficiency Furnace - Natural Gas	90%	81%	36	20	12%	O	1.0%	1.77
		Water Heating	Energy Star Clothes Washer (w/ Gas WH & Elec. D	34%	28%	1	11	45%	O	10.0%	1.12
			Energy Star Clothes Washer (w/ Gas WH & Gas D	30%	25%	2	11	35%	O	10%	1.04
			Energy Star Dishwasher (w/Gas DHW)	13%	2%	1	13	4%	L	0.0%	1.42
			Gas-Condensing Water Heater - Natural Gas (EF=	40%	40%	4	13	26%	O	10.0%	0.54
			Heat pump water heater replacement for gas water	40%	40%	5	20	100%	O	2.5%	1.47
			High Efficiency Water Heater - Natural Gas (EF=0.	2%	2%	0	13	5%	O	10.0%	1.02
			High Efficiency Water Heater - Natural Gas (EF=0.	0%	0%	-	13	12%	O	10%	0.68
			Indirect-fired domestic water heater - NG boiler w/	29%	29%	2	20	28%	M	5.0%	1.28
			Whole-House Tankless Water Heater (Gas or LP)	40%	38%	3	20	40%	O	5%	0.84

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Education	NC	Pool	Solar Pool Heater	0.00%	0%	0.017	40%	0.000105	L	0.5%	0.98
		Lighting equipment	CFL Fixture	1.16%	50%	0.037	69%	0.000108	M	5.0%	2.98
			Electronic ballast	13.48%	90%	0.388	30%	0.000108	H	12.5%	1.52
			HPT8 Fixture to replace T8	27.37%	10%	0.788	11%	0.000108	O	30.0%	0.41
			LED Exterior Lighting	0.59%	1%	0.023	90%	0.000108	O	2.5%	0.38
			LED Task Lighting	1.16%	2%	0.037	35%	0.000108	O	2.5%	0.17
		Refrig - Cooler/Freezer equip	Economizer for Coolers	0.75%	20%	0.029	20%	0.000046	M	5.0%	2.58
		Refrig - RCx / controls	Floating Head Pressure Control	1.50%	16%	0.058	7%	0.000046	M	5.0%	1.61
		Lighting controls / design	Bi-level stairwell lighting	3.06%	10%	0.088	50%	0.000108	H	12.5%	3.34
			Efficient lighting design/layout	43.00%	30%	1.238	20%	0.000108	O	3.4%	1.99
		Cooling Equipment	Desiccant Dehumidification	14.65%	5%	0.562	5%	0.001214	L	0.5%	0.76
			Economizer	7.81%	84%	0.250	20%	0.001214	M	5.0%	3.98
		HVAC RCx / Controls	Energy Management System	27.31%	50%	0.828	10%	0.001214	M	5.0%	2.04
			HVAC System Commissioning	27.31%	5%	0.828	10%	0.001214	H	12.5%	1.94
			Thermal Energy Storage	5.01%	0%	0.192	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.81%	15%	0.155	5%	0.000105	M	5.0%	3.30
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000046	M	5.0%	8.60
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.24%	50%	0.007	40%	0.000108	H	12.5%	4.47
		Shell improvement	High performance integrated desig	21.56%	15%	0.828	30%	0.001214	H	12.5%	2.36
			Shell: Improved Insulation and Air	27.31%	65%	0.828	8%	0.001141	M	5.0%	3.58
			Shell: Reduced Solar Gain	25.88%	25%	0.828	11%	0.001141	H	12.5%	1.49

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Education	Retrofit	Pool	Pool Cover	0.54%	5%	0.982	60%	0.000105	M	1.6%	0.74
		Lighting equipment	Advanced Metal Halide	0.43%	15%	1.407	30%	0.000108	O	10.0%	0.83
			CFL Screw in	0.97%	40%	2.111	71%	0.000108	O	4.0%	2.02
			Electronic ballast	13.48%	90%	22.056	30%	0.000108	O	6.3%	0.42
			HE Halogen	0.97%	20%	2.111	30%	0.000108	M	1.6%	5.61
			HO T5 lamps	0.65%	20%	1.407	45%	0.000108	O	6.3%	1.43
			HPT8 Fixture to replace T12	14.86%	30%	24.317	28%	0.000108	O	6.3%	0.95
			Induction	0.71%	1%	1.293	10%	0.000108	O	6.3%	0.50
			LED Exit Lights	0.18%	60%	0.317	75%	0.000108	H	3.8%	0.70
			LED Exterior Lighting	0.59%	1%	1.293	90%	0.000108	M	1.6%	0.29
			LED Traffic lights	0.00%	1%	0.000	90%	0.000108	M	1.6%	0.25
			Upgrade Ellipsoidal Reflector Lamp	0.01%	40%	0.021	30%	0.000108	O	6.0%	1.25
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	0.90%	10%	1.636	4%	0.000046	L	0.5%	0.47
			Ambient Sub-Cooling - oversized c	1.80%	10%	3.272	5%	0.000046	O	1.3%	0.45
			Economizer for Coolers	0.75%	20%	1.636	20%	0.000046	L	0.5%	2.58
			Evaporative Cooling	1.80%	35%	3.272	5%	0.000046	L	0.5%	1.61
			Evaporator Fan Controller	0.04%	10%	0.065	10%	0.000046	L	0.5%	2.88
			HE Compressors	1.80%	12%	3.272	8%	0.000046	O	2.0%	0.76
			Insulated Suction Lines	1.80%	75%	3.272	1%	0.000046	L	0.5%	0.35
			Liquid Pressure Amplifiers	1.80%	95%	3.272	5%	0.000046	L	0.5%	1.65
			Mechanical Subcooling - additional	1.80%	95%	3.272	5%	0.000046	L	0.5%	1.28
			Parallel Rack Systems	0.70%	10%	3.272	5%	0.000046	L	0.5%	1.61
			VSD on Refrigeration Circulating P	0.03%	10%	0.065	30%	0.000046	H	3.8%	0.41
			VSD on Refrigeration Fan	0.04%	25%	0.065	30%	0.000046	H	3.8%	0.80
		Refrig - RCx / controls	Anti-sweat heater controls	0.00%	24%	0.000	5%	0.000046	O	9.5%	1.52
			Case Lights-off timer (12am and 6a	0.00%	25%	0.000	3%	0.000046	M	1.6%	1.93
			Cooler/Freezer Door Auto Closers	0.50%	25%	1.636	4%	0.000046	H	3.8%	1.80
			Cooler/Freezer Door Gaskets	0.40%	25%	1.636	2%	0.000046	H	3.8%	1.80
			Cycle fan off with thermostat; duty c	0.60%	25%	3.272	5%	0.000046	M	1.6%	3.85
			Defrost Control System	1.80%	55%	3.272	3%	0.000046	L	0.5%	1.04
			Floating Head Pressure Control	1.50%	8%	3.272	7%	0.000046	M	1.6%	1.16
			Refrigeration E-Cube	1.90%	5%	3.272	2%	0.000046	H	3.8%	0.62
			Refrigeration System Maintenance	1.80%	8%	3.272	5%	0.000046	O	4.0%	1.61
			Strip Curtains	0.85%	22%	1.636	4%	0.000046	O	6.5%	1.80
		Lighting controls / design	Bi-level stairwell lighting	3.06%	5%	5.013	50%	0.000108	M	1.6%	0.54
			Daylighting controls	3.00%	1%	6.545	20%	0.000108	O	1.0%	0.25
			Exterior light timers	0.79%	50%	1.293	25%	0.000108	O	3.0%	3.99
			Occupancy Sensor	28.60%	26%	66.836	23%	0.000108	O	4.0%	4.96
			Scheduled interior lighting	38.81%	25%	66.836	10%	0.000108	M	1.6%	2.03

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Education	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	4.22%	68%	7.673	15%	0.001214	M	1.6%	1.04
			Desiccant Dehumidification	9.77%	5%	31.954	5%	0.001214	L	0.5%	0.19
			HE Chillers (air and water cooled)	4.22%	60%	7.673	15%	0.001214	H	3.8%	1.87
			HE Motors (VSDs, ECMs, on fans)	16.60%	28%	31.954	2%	0.001214	O	4.0%	2.44
			HE Rooftop AC systems	2.12%	10%	3.845	15%	0.001214	M	1.6%	4.67
			Ultraviolet A/C Coil Cleaning Syster	0.45%	25%	0.818	4%	0.001214	M	1.6%	0.59
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	4.46%	15%	7.673	5%	0.001214	M	1.6%	1.19
			Energy Management System	27.31%	90%	47.043	11%	0.001214	O	2.5%	0.86
			Guest room contls	0.00%	0%	1.145	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	28.75%	50%	47.043	8%	0.001214	O	2.5%	2.73
			HVAC System Retrocommissioning	27.31%	5%	47.043	15%	0.001214	O	2.5%	2.43
			Improve Duct Sealing	12.94%	15%	47.043	1%	0.001214	O	2.5%	3.97
			Insulate Pipes/Lines	28.75%	10%	47.043	1%	0.001214	O	2.5%	0.14
			Programmable Thermostat	10.06%	13%	47.043	4%	0.001214	O	2.5%	1.52
			Time Clock	28.75%	95%	47.043	4%	0.001214	O	2.5%	1.52
			Direct load control AC	5.14%	2%	11.219	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.06%	15%	0.123	60%	0.000108	M	1.6%	0.37
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.78%	20%	8.835	100%	0.000105	L	0.5%	0.67
			Grey Water Heat Exchanger	3.56%	8%	8.835	50%	0.000105	L	0.5%	1.06
			Heat Trap	3.56%	60%	8.835	5%	0.000105	M	1.6%	1.06
			Insulating Blankets	2.70%	65%	8.835	4%	0.000105	M	1.6%	0.97
			Pipe Insulation	0.41%	25%	0.884	1%	0.000105	M	1.6%	1.19
			Reduced Temperature Setpoints	3.56%	85%	8.835	19%	0.000105	O	2.5%	8.59
			Timers	3.56%	60%	8.835	5%	0.000105	O	2.5%	2.38
			Water Heater Cycling	3.56%	60%	8.835	5%	0.000105	O	2.5%	2.38
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.24%	20%	0.393	45%	0.000108	H	3.8%	1.87
			HE Battery Charging Station	0.04%	10%	0.065	35%	0.000108	M	1.6%	1.15
			Plug Load Sensors	0.12%	70%	0.196	20%	0.000108	M	1.6%	1.48
			Power Management Software	2.28%	35%	3.927	15%	0.000108	M	1.6%	1.22
		Faucets / Nozzles	Faucet Aerators	0.51%	40%	0.884	20%	0.000105	M	1.6%	2.21
			Low Flow Pre-Rinse Nozzles	0.24%	45%	0.884	55%	0.000105	M	1.6%	7.49
			Low Flow Showerhead	0.24%	15%	0.884	1%	0.000105	M	1.6%	1.80
			Ultrasonic Faucet Control	0.49%	25%	0.884	3%	0.000105	M	1.6%	0.72
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	2.292	100%	-	M	1.6%	1.53
		Process equip	TOD Pool Pump Timer	0.60%	5%	0.982	10%	0.000105	M	1.6%	2.27
			Vendor Miser	0.01%	75%	0.016	46%	0.000108	M	1.6%	1.56
		Shell improvement	Shell: Insulating and Air Sealing	24.44%	15%	47.043	12%	0.001141	M	1.6%	1.08
			Shell: Reduced Solar Gain	24.44%	25%	47.043	11%	0.001141	H	3.8%	0.09
		Refrig - Displays	New case doors	0.00%	6%	0.000	10%	0.000046	O	6.5%	0.97
			Night Covers for Display Cases	0.00%	12%	0.000	6%	0.000046	H	3.8%	0.63
			Refrigerated Case Doors - Door Mis	0.00%	8%	0.000	10%	0.000046	H	3.8%	1.80
			Refrigerated Case Doors - Low/No	0.00%	5%	0.000	3%	0.000046	O	6.5%	5.67

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Education	ROB	Lighting equipment	CFL Screw in	0.97%	40%	1.092	71%	0.000108	M	5.0%	2.02
			HPT8 Fixture to replace T8	27.37%	5%	5.266	11%	0.000108	O	20.0%	0.24
			LED Refrigerated Case Door Lighti	0.09%	0%	0.019	25%	0.000108	H	12.5%	1.55
			LED Task Lighting	1.16%	2%	0.248	35%	0.000108	M	5.0%	0.20
		Refrig - Cooler/Freezer equip	ECM Motors on fans	1.50%	51%	0.276	7%	0.000046	O	6.3%	2.10
			Evaporative Cooling	1.80%	10%	0.385	5%	0.000046	L	0.5%	1.61
			HE Compressors	1.80%	12%	0.276	8%	0.000046	O	15.0%	4.43
			PSC Motors on fans	1.80%	31%	0.276	1%	0.000046	M	5.0%	0.37
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.04%	5%	0.010	65%	0.000108	L	0.5%	1.48
			HE Dishwashers	1.05%	20%	0.312	25%	0.000105	M	5.0%	0.89
		Cooling Equipment	HE Chillers (air and water cooled)	4.22%	33%	0.469	25%	0.001214	H	12.5%	1.35
			HE Packaged AC (non rooftop)	2.25%	25%	0.413	16%	0.001214	O	10.0%	3.15
			HE Rooftop AC systems	2.25%	10%	0.413	25%	0.001214	O	10.0%	3.32
			PTAC and PTHP	0.63%	15%	0.097	30%	0.001214	O	10.0%	0.63
			Geothermal Heat Pumps	0.09%	5%	0.134	36%	0.001214	O	5.0%	1.46
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.005	50%	0.000108	L	0.5%	1.85
			HE (ES) Fryers	0.01%	25%	0.005	15%	0.000108	L	0.5%	0.60
			HE (ES) Hot Food Holding Cabinet	0.05%	25%	0.010	60%	0.000108	L	0.5%	2.16
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.005	50%	0.000108	L	0.5%	1.85
			HE Broilers	0.03%	40%	0.005	18%	0.000108	L	0.5%	0.72
			HE Griddles	0.03%	40%	0.005	32%	0.000108	L	0.5%	1.23
			HE Induction Cooking	0.02%	25%	0.005	20%	0.000108	L	0.5%	0.79
			HE Ovens	0.03%	50%	0.005	2%	0.000108	L	0.5%	0.05
			Solid State Temperature Controls	0.01%	15%	0.001	15%	0.000108	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	5.40%	35%	1.039	5%	0.000105	M	5.0%	2.66
			Heat Pump Water Heating	3.56%	5%	1.039	59%	0.000105	M	5.0%	0.85
		Data / computing / office equip	HE (ES) Computers	2.40%	75%	0.630	25%	0.000108	M	5.0%	1.04
			HE (ES) Other Office Equipment	0.80%	65%	0.154	25%	0.000108	M	5.0%	1.22
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.103	8%	-	O	5.0%	1.87
		Process equip	HE (ES) Icemakers	0.20%	25%	0.038	25%	0.000108	M	5.0%	2.01
			HE (ES) Refrig. Bev. Vending Mach	0.01%	25%	0.002	20%	0.000108	M	5.0%	0.79
			HE (ES) Water Cooler	0.03%	25%	0.008	15%	0.000108	M	5.0%	0.27
			HE Commercial Clothes Dryers	0.08%	20%	0.015	10%	0.000108	M	5.0%	0.58
			HE Commercial Clothes Washers	0.08%	20%	0.015	35%	0.000108	M	5.0%	1.79
			Low Pressure Drop Pool Filter	0.54%	5%	0.999	5%	0.000105	M	5.0%	0.34
		Clotheswashing	HE Clothes Washers	0.81%	20%	0.312	45%	0.000105	M	5.0%	0.61

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Sales	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000147	L	0.5%	1.99
		Lighting equipment	CFL Fixture	0.38%	50%	0.009	69%	0.000145	M	5.0%	3.06
			Electronic ballast	9.47%	90%	0.193	30%	0.000145	M	5.0%	1.56
			HPT8 Fixture to replace T8	11.11%	10%	0.226	11%	0.000145	O	30.0%	0.43
			LED Exterior Lighting	0.59%	1%	0.016	90%	0.000145	O	2.5%	0.39
			LED Task Lighting	0.38%	2%	0.009	35%	0.000145	O	2.5%	0.17
		Refrig - Cooler/Freezer equip	Economizer for Coolers	16.88%	20%	0.458	20%	0.000147	H	12.5%	2.74
		Refrig - RCx / controls	Floating Head Pressure Control	33.75%	16%	0.917	7%	0.000147	H	12.5%	3.27
		Lighting controls / design	Bi-level stairwell lighting	1.33%	10%	0.031	50%	0.000145	M	5.0%	3.43
			Efficient lighting design/layout	21.00%	30%	0.428	20%	0.000145	O	3.4%	2.04
		Cooling Equipment	Desiccant Dehumidification	4.88%	5%	0.133	5%	0.001052	L	0.5%	0.71
			Economizer	4.88%	84%	0.110	20%	0.001052	M	5.0%	3.76
		HVAC RCx / Controls	Energy Management System	11.85%	50%	0.254	10%	0.001052	M	5.0%	0.60
			HVAC System Commissioning	11.85%	5%	0.254	10%	0.001052	H	12.5%	1.05
			Thermal Energy Storage	0.00%	0%	0.000	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	1.35%	15%	0.183	5%	0.000147	M	5.0%	3.38
			Heat Recovery for Hot Water Use	6.75%	28%	0.183	40%	0.000147	H	12.5%	18.88
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.02%	50%	0.000	40%	0.000145	H	12.5%	7.09
		Shell improvement	High performance integrated desig	9.36%	15%	0.254	30%	0.001052	H	12.5%	0.94
			Shell: Improved Insulation and Air	11.85%	65%	0.254	8%	0.000989	M	5.0%	7.45
			Shell: Reduced Solar Gain	11.23%	25%	0.254	3%	0.000989	H	12.5%	2.86

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Food Sales	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000147	M	1.6%	1.59
		Lighting equipment	Advanced Metal Halide	1.00%	15%	2.315	30%	0.000145	O	10.0%	0.85
			CFL Screw in	0.32%	40%	0.486	71%	0.000145	O	4.0%	2.08
			Electronic ballast	9.47%	90%	10.956	30%	0.000145	O	6.3%	0.43
			HE Halogen	0.32%	20%	0.486	30%	0.000145	M	1.6%	5.76
			HO T5 lamps	0.00%	30%	0.000	45%	0.000145	O	6.3%	1.47
			HPT8 Fixture to replace T12	10.44%	5%	12.079	28%	0.000145	O	6.3%	0.97
			Induction	0.71%	5%	0.914	10%	0.000145	O	6.3%	0.50
			LED Exit Lights	0.06%	60%	0.073	75%	0.000145	H	3.8%	0.72
			LED Exterior Lighting	0.59%	1%	0.914	90%	0.000145	M	1.6%	0.30
			LED Traffic lights	0.00%	1%	0.000	90%	0.000145	M	1.6%	0.19
			Upgrade Ellipsoidal Reflector Lamp	0.00%	60%	0.005	30%	0.000145	O	6.0%	1.29
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	20.25%	10%	26.038	4%	0.000147	L	0.5%	1.05
			Ambient Sub-Cooling - oversized c	40.50%	10%	52.077	5%	0.000147	O	1.3%	1.01
			Economizer for Coolers	16.88%	20%	26.038	20%	0.000147	M	1.6%	4.80
			Evaporative Cooling	40.50%	35%	52.077	5%	0.000147	L	0.5%	3.27
			Evaporator Fan Controller	0.81%	10%	1.042	10%	0.000147	M	1.6%	5.36
			HE Compressors	40.50%	12%	52.077	8%	0.000147	O	2.0%	1.64
			Insulated Suction Lines	40.50%	75%	52.077	1%	0.000147	L	0.5%	0.79
			Liquid Pressure Amplifiers	40.50%	95%	52.077	5%	0.000147	L	0.5%	3.35
			Mechanical Subcooling - additional	40.50%	95%	52.077	5%	0.000147	L	0.5%	2.66
			Parallel Rack Systems	15.75%	10%	52.077	5%	0.000147	L	0.5%	3.27
			VSD on Refrigeration Circulating P	0.68%	10%	1.042	30%	0.000147	H	3.8%	0.91
			VSD on Refrigeration Fan	0.83%	25%	1.042	30%	0.000147	H	3.8%	1.72
		Refrig - RCx / controls	Anti-sweat heater controls	14.11%	24%	17.185	5%	0.000147	O	9.5%	3.12
			Case Lights-off timer (12am and 6a	7.43%	25%	17.185	3%	0.000147	H	3.8%	3.94
			Cooler/Freezer Door Auto Closers	11.25%	25%	26.038	4%	0.000147	H	3.8%	3.66
			Cooler/Freezer Door Gaskets	9.00%	25%	26.038	2%	0.000147	H	3.8%	2.62
			Cycle fan off with thermostat; duty c	13.50%	25%	52.077	5%	0.000147	H	3.8%	6.90
			Defrost Control System	40.50%	55%	52.077	3%	0.000147	M	1.6%	2.21
			Floating Head Pressure Control	33.75%	8%	52.077	7%	0.000147	H	3.8%	2.45
			Refrigeration E-Cube	42.75%	5%	52.077	2%	0.000147	H	3.8%	1.37
			Refrigeration System Maintenance	40.50%	8%	52.077	5%	0.000147	O	4.0%	3.27
			Strip Curtains	19.13%	22%	26.038	4%	0.000147	O	6.5%	3.66
		Lighting controls / design	Bi-level stairwell lighting	1.33%	5%	1.786	50%	0.000145	M	1.6%	0.56
			Daylighting controls	3.00%	1%	4.629	20%	0.000145	O	1.0%	0.26
			Exterior light timers	0.79%	90%	0.914	25%	0.000145	O	3.0%	4.07
			Occupancy Sensor	14.41%	26%	23.816	2%	0.000145	O	4.0%	1.90
			Scheduled interior lighting	20.58%	50%	23.816	10%	0.000145	L	0.5%	2.20

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Sales	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	1.22%	68%	1.562	15%	0.001052	M	1.6%	0.98
			Desiccant Dehumidification	3.26%	5%	7.534	5%	0.001052	L	0.5%	0.18
			HE Chillers (air and water cooled)	1.22%	60%	1.562	15%	0.001052	H	3.8%	1.77
			HE Motors (VSDs, ECMs, on fans)	5.53%	28%	7.534	2%	0.001052	O	4.0%	2.30
			HE Rooftop AC systems	2.07%	10%	2.656	15%	0.001052	M	1.6%	7.69
			Ultraviolet A/C Coil Cleaning Syster	0.46%	25%	0.590	4%	0.001052	M	1.6%	0.56
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	1.28%	15%	1.562	5%	0.001052	M	1.6%	1.12
			Energy Management System	9.36%	10%	14.440	11%	0.001052	O	2.5%	0.35
			Guest room contls	0.00%	0%	0.822	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	12.48%	20%	14.440	8%	0.001052	O	2.5%	1.10
			HVAC System Retrocommissioning	11.85%	5%	14.440	15%	0.001052	O	2.5%	1.40
			Improve Duct Sealing	5.61%	15%	14.440	1%	0.001052	O	2.5%	2.41
			Insulate Pipes/Lines	12.48%	10%	14.440	1%	0.001052	O	2.5%	0.13
			Programmable Thermostat	4.37%	13%	14.440	4%	0.001052	O	2.5%	0.61
			Time Clock	12.48%	95%	14.440	4%	0.001052	O	2.5%	0.61
			Direct load control AC	0.00%	2%	0.000	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.07%	15%	0.104	60%	0.000145	M	1.6%	0.80
		DHW System improvements	DHW Fuel Switching (elec to gas)	2.97%	20%	10.415	100%	0.000147	L	0.5%	1.32
			Grey Water Heat Exchanger	5.94%	8%	10.415	50%	0.000147	L	0.5%	2.22
			Heat Trap	5.94%	60%	10.415	5%	0.000147	M	1.6%	2.22
			Insulating Blankets	4.50%	65%	10.415	4%	0.000147	M	1.6%	2.06
			Pipe Insulation	0.68%	25%	1.042	1%	0.000147	M	1.6%	2.49
			Reduced Temperature Setpoints	5.94%	50%	10.415	19%	0.000147	O	2.5%	11.27
			Timers	5.94%	60%	10.415	5%	0.000147	O	2.5%	4.52
			Water Heater Cycling	5.94%	60%	10.415	5%	0.000147	O	2.5%	4.52
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.02%	20%	0.023	45%	0.000145	H	3.8%	3.40
			HE Battery Charging Station	0.01%	10%	0.012	35%	0.000145	M	1.6%	2.14
			Plug Load Sensors	0.01%	70%	0.012	20%	0.000145	L	0.5%	2.69
			Power Management Software	0.10%	25%	0.116	15%	0.000145	M	1.6%	2.26
		Faucets / Nozzles	Faucet Aerators	0.86%	40%	1.042	20%	0.000147	M	1.6%	7.74
			Low Flow Pre-Rinse Nozzles	0.41%	45%	1.042	5%	0.000147	M	1.6%	10.85
			Low Flow Showerhead	0.41%	15%	1.042	1%	0.000147	M	1.6%	3.57
			Ultrasonic Faucet Control	0.81%	5%	1.042	3%	0.000147	M	1.6%	1.55
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	1.621	100%	-	M	1.6%	1.53
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000147	M	1.6%	4.43
			Vendor Miser	0.01%	30%	0.014	46%	0.000145	M	1.6%	1.59
		Shell improvement	Shell: Insulating and Air Sealing	10.61%	15%	14.440	12%	0.000989	L	0.5%	2.33
			Shell: Reduced Solar Gain	10.61%	25%	14.440	3%	0.000989	M	1.6%	0.18
		Refrig - Displays	New case doors	14.11%	8%	17.185	10%	0.000147	O	6.5%	2.06
			Night Covers for Display Cases	14.11%	12%	17.185	6%	0.000147	H	3.8%	1.39
			Refrigerated Case Doors - Door Mis	14.11%	8%	17.185	10%	0.000147	H	3.8%	3.66
			Refrigerated Case Doors - Low/No	14.11%	5%	17.185	3%	0.000147	O	6.5%	8.75

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Food Sales	ROB	Lighting equipment	CFL Screw in	0.32%	40%	0.252	71%	0.000145	M	5.0%	2.08
			HPT8 Fixture to replace T8	11.11%	10%	1.512	11%	0.000145	O	20.0%	0.25
			LED Refrigerated Case Door Lighti	0.90%	20%	0.136	25%	0.000145	H	12.5%	1.59
			LED Task Lighting	0.38%	2%	0.057	35%	0.000145	M	5.0%	0.21
		Refrig - Cooler/Freezer equip	ECM Motors on fans	33.75%	51%	4.388	7%	0.000147	O	6.3%	4.05
			Evaporative Cooling	40.50%	10%	6.124	5%	0.000147	L	0.5%	3.27
			HE Compressors	40.50%	12%	4.388	8%	0.000147	O	15.0%	7.23
			PSC Motors on fans	40.50%	31%	4.388	1%	0.000147	M	5.0%	0.82
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.05%	5%	0.008	65%	0.000145	L	0.5%	2.98
			HE Dishwashers	0.29%	20%	0.061	3%	0.000147	M	5.0%	0.92
		Cooling Equipment	HE Chillers (air and water cooled)	1.22%	33%	0.095	25%	0.001052	H	12.5%	1.28
			HE Packaged AC (non rooftop)	2.30%	25%	0.298	16%	0.001052	O	10.0%	2.97
			HE Rooftop AC systems	2.30%	10%	0.298	25%	0.001052	O	10.0%	5.82
			PTAC and PTHP	0.64%	15%	0.069	30%	-	O	10.0%	0.00
			Geothermal Heat Pumps	0.04%	5%	0.043	36%	0.001052	O	5.0%	1.45
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.004	50%	-	L	0.5%	0.00
			HE (ES) Fryers	0.02%	25%	0.004	15%	0.000145	L	0.5%	1.29
			HE (ES) Hot Food Holding Cabinet	0.05%	25%	0.008	60%	0.000145	L	0.5%	4.16
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.004	50%	-	L	0.5%	0.00
			HE Broilers	0.03%	40%	0.004	18%	0.000145	L	0.5%	1.53
			HE Griddles	0.03%	40%	0.004	32%	0.000145	L	0.5%	2.53
			HE Induction Cooking	0.03%	25%	0.004	20%	-	L	0.5%	0.00
			HE Ovens	0.03%	33%	0.004	2%	0.000145	L	0.5%	0.11
			Solid State Temperature Controls	0.01%	15%	0.001	15%	0.000145	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	9.00%	35%	1.225	5%	0.000147	M	5.0%	2.73
			Heat Pump Water Heating	3.56%	5%	0.735	59%	0.000147	M	5.0%	1.81
		Data / computing / office equip	HE (ES) Computers	0.10%	75%	0.019	25%	0.000145	M	5.0%	1.95
			HE (ES) Other Office Equipment	0.10%	65%	0.014	25%	0.000145	M	5.0%	2.26
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.073	8%	-	O	5.0%	1.87
		Process equip	HE (ES) Icemakers	0.75%	25%	0.102	25%	0.000145	L	0.5%	1.33
			HE (ES) Refrig. Bev. Vending Mach	0.00%	25%	0.002	20%	0.000145	M	5.0%	0.81
			HE (ES) Water Cooler	0.01%	25%	0.001	15%	0.000145	M	5.0%	0.27
			HE Commercial Clothes Dryers	0.02%	20%	0.003	10%	-	M	5.0%	0.00
			HE Commercial Clothes Washers	0.02%	43%	0.003	35%	-	M	5.0%	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000147	M	5.0%	0.77
		Clotheswashing	HE Clothes Washers	0.23%	20%	0.061	45%	0.000147	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000105	L	0.5%	1.78
		Lighting equipment	CFL Fixture	3.24%	50%	0.076	69%	0.000139	M	5.0%	4.74
			Electronic ballast	7.54%	90%	0.159	30%	0.000139	M	5.0%	2.76
			HPT8 Fixture to replace T8	8.86%	10%	0.187	11%	0.000139	O	30.0%	0.83
			LED Exterior Lighting	0.89%	1%	0.025	90%	0.000139	O	2.5%	0.76
			LED Task Lighting	3.24%	2%	0.076	35%	0.000139	O	2.5%	0.34
		Refrig - Cooler/Freezer equip	Economizer for Coolers	12.00%	20%	0.337	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	24.00%	16%	0.674	7%	0.000046	M	5.0%	2.86
		Lighting controls / design	Bi-level stairwell lighting	1.02%	10%	0.026	50%	0.000139	M	5.0%	5.30
			Efficient lighting design/layout	20.00%	30%	0.421	20%	0.000139	O	3.4%	3.49
		Cooling Equipment	Desiccant Dehumidification	5.70%	5%	0.160	5%	0.000856	L	0.5%	1.29
			Economizer	7.81%	84%	0.183	20%	0.000856	M	5.0%	5.92
		HVAC RCx / Controls	Energy Management System	15.98%	50%	0.354	10%	0.000856	M	5.0%	3.99
			HVAC System Commissioning	15.98%	5%	0.354	10%	0.000856	H	12.5%	3.54
			Thermal Energy Storage	5.01%	0%	0.141	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	2.10%	15%	0.295	5%	0.000105	M	5.0%	3.30
			Heat Recovery for Hot Water Use	10.50%	28%	0.295	40%	0.000046	M	5.0%	17.17
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.02%	50%	0.000	40%	0.000139	H	12.5%	7.44
		Shell improvement	High performance integrated desig	12.61%	15%	0.354	30%	0.000856	H	12.5%	4.45
			Shell: Improved Insulation and Air	15.98%	65%	0.354	8%	0.000804	M	5.0%	6.72
			Shell: Reduced Solar Gain	15.14%	25%	0.354	10%	0.000804	H	12.5%	2.41

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000105	M	1.6%	1.41
		Lighting equipment	Advanced Metal Halide	0.00%	15%	0.000	30%	0.000139	O	10.0%	1.59
			CFL Screw in	2.70%	40%	4.310	71%	0.000139	O	4.0%	3.59
			Electronic ballast	7.54%	90%	9.031	30%	0.000139	O	6.3%	0.83
			HE Halogen	2.70%	20%	4.310	30%	0.000139	M	1.6%	7.70
			HO T5 lamps	0.00%	30%	0.000	45%	0.000139	O	6.3%	2.62
			HPT8 Fixture to replace T12	8.32%	5%	9.957	28%	0.000139	O	6.3%	0.97
			Induction	1.07%	5%	1.419	10%	0.000139	O	6.3%	0.99
			LED Exit Lights	0.17%	60%	0.215	75%	0.000139	H	3.8%	1.36
			LED Exterior Lighting	0.89%	1%	1.419	90%	0.000139	M	1.6%	0.59
			LED Traffic lights	0.00%	1%	0.000	90%	0.000139	M	1.6%	0.37
			Upgrade Ellipsoidal Reflector Lamp	0.03%	60%	0.043	30%	0.000139	O	6.0%	2.33
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	14.40%	10%	19.155	4%	0.000046	L	0.5%	0.91
			Ambient Sub-Cooling - oversized c	28.80%	10%	38.309	5%	0.000046	O	1.3%	0.87
			Economizer for Coolers	12.00%	20%	19.155	20%	0.000046	L	0.5%	4.26
			Evaporative Cooling	28.80%	35%	38.309	5%	0.000046	L	0.5%	2.86
			Evaporator Fan Controller	0.58%	10%	0.766	10%	0.000046	L	0.5%	4.75
			HE Compressors	28.80%	12%	38.309	8%	0.000046	O	2.0%	1.43
			Insulated Suction Lines	28.80%	75%	38.309	1%	0.000046	L	0.5%	0.68
			Liquid Pressure Amplifiers	28.80%	95%	38.309	5%	0.000046	L	0.5%	2.93
			Mechanical Subcooling - additional	28.80%	95%	38.309	5%	0.000046	L	0.5%	2.32
			Parallel Rack Systems	11.20%	10%	38.309	5%	0.000046	L	0.5%	2.86
			VSD on Refrigeration Circulating P	0.48%	10%	0.766	30%	0.000046	H	3.8%	0.79
			VSD on Refrigeration Fan	0.59%	25%	0.766	30%	0.000046	H	3.8%	1.49
		Refrig - RCx / controls	Anti-sweat heater controls	10.03%	24%	12.642	6%	0.000046	O	9.5%	2.73
			Case Lights-off timer (12am and 6a	5.28%	25%	12.642	3%	0.000046	M	1.6%	3.44
			Cooler/Freezer Door Auto Closers	8.00%	25%	19.155	4%	0.000046	H	3.8%	3.21
			Cooler/Freezer Door Gaskets	6.40%	25%	19.155	2%	0.000046	H	3.8%	2.23
			Cycle fan off with thermostat; duty c	9.60%	25%	38.309	5%	0.000046	M	1.6%	6.14
			Defrost Control System	28.80%	55%	38.309	3%	0.000046	L	0.5%	1.92
			Floating Head Pressure Control	24.00%	8%	38.309	7%	0.000046	M	1.6%	2.13
			Refrigeration E-Cube	30.40%	5%	38.309	2%	0.000046	H	3.8%	1.18
			Refrigeration System Maintenance	28.80%	8%	38.309	5%	0.000046	O	4.0%	2.86
			Strip Curtains	13.60%	22%	19.155	4%	0.000046	O	6.5%	3.21
		Lighting controls / design	Bi-level stairwell lighting	1.02%	5%	1.473	50%	0.000139	M	1.6%	1.07
			Daylighting controls	4.50%	1%	7.183	20%	0.000139	O	1.0%	0.51
			Exterior light timers	1.19%	90%	1.419	10%	0.000139	O	3.0%	3.65
			Occupancy Sensor	13.02%	26%	22.267	2%	0.000139	O	4.0%	3.27
			Scheduled interior lighting	17.67%	0%	22.267	10%	0.000139	L	0.5%	3.83

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	0.00%	68%	0.000	15%	0.000856	M	1.6%	1.74
			Desiccant Dehumidification	3.80%	5%	9.092	5%	0.000856	L	0.5%	0.34
			HE Chillers (air and water cooled)	0.00%	60%	0.000	15%	0.000856	H	3.8%	2.99
			HE Motors (VSDs, ECMs, on fans)	6.46%	28%	9.092	2%	0.000856	O	4.0%	3.91
			HE Rooftop AC systems	3.79%	10%	5.041	15%	0.000856	M	1.6%	6.71
			Ultraviolet A/C Coil Cleaning Syster	0.81%	25%	1.075	4%	0.000856	M	1.6%	1.01
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	0.00%	15%	0.000	5%	0.000856	M	1.6%	1.99
			Energy Management System	12.61%	10%	20.133	11%	0.000856	O	2.5%	1.65
			Guest room contls	0.00%	0%	1.496	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	16.82%	20%	20.133	8%	0.000856	O	2.5%	5.17
			HVAC System Retrocommissioning	15.98%	5%	20.133	15%	0.000856	O	2.5%	4.37
			Improve Duct Sealing	7.57%	15%	20.133	1%	0.000856	O	2.5%	6.83
			Insulate Pipes/Lines	16.82%	20%	20.133	1%	0.000856	O	2.5%	0.24
			Programmable Thermostat	5.89%	13%	20.133	4%	0.000856	O	2.5%	2.91
			Time Clock	16.82%	95%	20.133	4%	0.000856	O	2.5%	2.91
			Direct load control AC	5.14%	2%	8.209	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.29%	15%	0.467	60%	0.000139	M	1.6%	0.73
		DHW System improvements	DHW Fuel Switching (elec to gas)	4.62%	20%	16.760	100%	0.000105	L	0.5%	1.11
			Grey Water Heat Exchanger	9.24%	8%	16.760	25%	0.000105	L	0.5%	1.97
			Heat Trap	9.24%	60%	16.760	5%	0.000105	M	1.6%	1.97
			Insulating Blankets	7.00%	65%	16.760	4%	0.000105	M	1.6%	1.82
			Pipe Insulation	1.05%	25%	1.676	1%	0.000105	M	1.6%	2.21
			Reduced Temperature Setpoints	9.24%	50%	16.760	19%	0.000105	O	2.5%	10.71
			Timers	9.24%	60%	16.760	5%	0.000105	O	2.5%	4.08
			Water Heater Cycling	9.24%	60%	16.760	5%	0.000105	O	2.5%	4.08
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.02%	20%	0.024	45%	0.000139	H	3.8%	3.65
			HE Battery Charging Station	0.01%	10%	0.012	35%	0.000139	M	1.6%	2.30
			Plug Load Sensors	0.01%	70%	0.012	20%	0.000139	L	0.5%	2.88
			Power Management Software	0.10%	25%	0.120	15%	0.000139	M	1.6%	2.43
		Faucets / Nozzles	Faucet Aerators	1.33%	40%	1.676	20%	0.000105	M	1.6%	7.11
			Low Flow Pre-Rinse Nozzles	0.63%	45%	1.676	55%	0.000105	M	1.6%	10.19
			Low Flow Showerhead	0.63%	15%	1.676	1%	0.000105	M	1.6%	3.20
			Ultrasonic Faucet Control	1.26%	25%	1.676	3%	0.000105	M	1.6%	1.37
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	1.677	100%	-	M	1.6%	1.65
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000105	M	1.6%	3.98
			Vendor Miser	0.05%	30%	0.062	46%	0.000139	M	1.6%	1.59
		Shell improvement	Shell: Insulating and Air Sealing	14.29%	15%	20.133	12%	0.000804	L	0.5%	2.09
			Shell: Reduced Solar Gain	14.29%	25%	20.133	10%	0.000804	M	1.6%	0.15
		Refrig - Displays	New case doors	10.03%	8%	12.642	10%	0.000046	O	6.5%	1.79
			Night Covers for Display Cases	10.03%	12%	12.642	6%	0.000046	H	3.8%	1.20
			Refrigerated Case Doors - Door Mis	10.03%	8%	12.642	10%	0.000046	H	3.8%	3.21
			Refrigerated Case Doors - Low/No	10.03%	5%	12.642	3%	0.000046	O	6.5%	7.94

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	ROB	Lighting equipment	CFL Screw in	2.70%	40%	2.231	71%	0.000139	M	5.0%	3.59
			HPT8 Fixture to replace T8	8.86%	10%	1.247	11%	0.000139	O	20.0%	0.49
			LED Refrigerated Case Door Lighti	0.09%	0%	0.014	25%	0.000139	H	12.5%	2.73
			LED Task Lighting	3.24%	2%	0.507	35%	0.000139	M	5.0%	0.41
		Refrig - Cooler/Freezer equip	ECM Motors on fans	24.00%	51%	3.228	7%	0.000046	O	6.3%	3.57
			Evaporative Cooling	28.80%	10%	4.505	5%	0.000046	L	0.5%	2.86
			HE Compressors	28.80%	12%	3.228	8%	0.000046	O	15.0%	6.52
			PSC Motors on fans	28.80%	31%	3.228	1%	0.000046	M	5.0%	0.71
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.22%	5%	0.037	65%	0.000139	L	0.5%	2.74
			HE Dishwashers	3.64%	20%	0.788	25%	0.000105	M	5.0%	0.89
		Cooling Equipment	HE Chillers (air and water cooled)	0.00%	33%	0.000	25%	0.000856	H	12.5%	2.22
			HE Packaged AC (non rooftop)	4.04%	25%	0.543	16%	0.000856	O	10.0%	4.84
			HE Rooftop AC systems	4.04%	10%	0.543	25%	0.000856	O	10.0%	5.03
			PTAC and PTHP	1.13%	15%	0.126	30%	-	O	10.0%	0.00
			Geothermal Heat Pumps	0.10%	5%	0.100	36%	0.000856	O	5.0%	1.63
		Process equip: cooking	Connectionless (Boilerless) Steame	0.10%	25%	0.018	50%	0.000139	L	0.5%	3.35
			HE (ES) Fryers	0.07%	25%	0.018	15%	0.000139	L	0.5%	1.18
			HE (ES) Hot Food Holding Cabinet	0.23%	25%	0.037	60%	0.000139	L	0.5%	3.86
			HE (ES) Steam Cookers / Steamer	0.10%	25%	0.018	50%	0.000139	L	0.5%	3.35
			HE Broilers	0.13%	25%	0.018	18%	0.000139	L	0.5%	1.40
			HE Griddles	0.13%	25%	0.018	32%	0.000139	L	0.5%	2.32
			HE Induction Cooking	0.12%	25%	0.018	20%	0.000139	L	0.5%	1.54
			HE Ovens	0.13%	20%	0.018	2%	0.000139	L	0.5%	0.10
			Solid State Temperature Controls	0.03%	15%	0.004	15%	0.000139	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	14.00%	35%	1.971	5%	0.000105	M	5.0%	2.66
			Heat Pump Water Heating	3.56%	5%	0.760	59%	0.000105	M	5.0%	1.60
		Data / computing / office equip	HE (ES) Computers	0.10%	75%	0.019	25%	0.000139	M	5.0%	2.10
			HE (ES) Other Office Equipment	0.10%	65%	0.014	25%	0.000139	M	5.0%	2.43
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.076	8%	-	O	5.0%	3.17
		Process equip	HE (ES) Icemakers	0.75%	25%	0.106	25%	0.000139	L	0.5%	1.33
			HE (ES) Refrig. Bev. Vending Mach	0.02%	25%	0.007	20%	0.000139	M	5.0%	0.81
			HE (ES) Water Cooler	0.01%	25%	0.001	15%	0.000139	M	5.0%	0.27
			HE Commercial Clothes Dryers	0.02%	20%	0.003	10%	0.000139	M	5.0%	1.22
			HE Commercial Clothes Washers	0.02%	43%	0.003	35%	0.000139	M	5.0%	3.39
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000105	M	5.0%	0.67
		Clotheswashing	HE Clothes Washers	2.10%	20%	0.591	45%	0.000105	M	5.0%	0.61

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Health Care	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000140	L	0.5%	2.69
		Lighting equipment	CFL Fixture	1.48%	50%	0.044	69%	0.000142	L	0.5%	6.01
			Electronic ballast	12.99%	90%	0.347	30%	0.000142	M	5.0%	3.92
			HPT8 Fixture to replace T8	26.37%	10%	0.704	11%	0.000142	O	30.0%	1.29
			LED Exterior Lighting	0.30%	1%	0.011	90%	0.000142	O	2.5%	1.21
			LED Task Lighting	1.48%	2%	0.044	35%	0.000142	O	2.5%	0.55
		Refrig - Cooler/Freezer equip	Economizer for Coolers	1.13%	20%	0.040	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	2.25%	16%	0.080	7%	0.000100	M	5.0%	4.30
		Lighting controls / design	Bi-level stairwell lighting	2.39%	30%	0.079	50%	0.000142	M	5.0%	6.72
			Efficient lighting design/layout	41.00%	30%	1.094	20%	0.000142	O	3.4%	4.79
		Cooling Equipment	Desiccant Dehumidification	7.32%	5%	0.261	5%	0.000506	L	0.5%	1.73
			Economizer	11.72%	84%	0.347	20%	0.000506	L	0.5%	6.92
		HVAC RCx / Controls	Energy Management System	22.68%	50%	0.637	10%	0.000506	M	5.0%	6.41
			HVAC System Commissioning	22.68%	5%	0.637	10%	0.000506	H	12.5%	5.25
			Thermal Energy Storage	0.00%	0%	0.000	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.81%	15%	0.144	5%	0.000140	M	5.0%	3.37
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000100	M	5.0%	28.30
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.60%	50%	0.016	40%	0.000142	H	12.5%	9.05
		Shell improvement	High performance integrated desig	17.90%	15%	0.637	30%	0.000506	H	12.5%	6.84
			Shell: Improved Insulation and Air	22.68%	65%	0.637	8%	0.000476	M	5.0%	10.32
			Shell: Reduced Solar Gain	21.48%	25%	0.637	9%	0.000476	H	12.5%	3.14

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Health Care	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000140	M	1.6%	2.26
		Lighting equipment	Advanced Metal Halide	0.00%	15%	0.000	30%	0.000142	O	10.0%	2.39
			CFL Screw in	1.23%	40%	2.487	71%	0.000142	O	4.0%	4.97
			Electronic ballast	12.99%	90%	19.696	30%	0.000142	O	6.3%	1.30
			HE Halogen	1.23%	20%	2.487	30%	0.000142	M	1.6%	8.86
			HO T5 lamps	0.00%	30%	0.000	45%	0.000142	O	6.3%	3.75
			HPT8 Fixture to replace T12	14.32%	20%	21.715	28%	0.000142	O	6.3%	0.97
			Induction	0.36%	5%	0.599	10%	0.000142	O	6.3%	1.55
			LED Exit Lights	0.23%	60%	0.373	75%	0.000142	H	3.8%	2.08
			LED Exterior Lighting	0.30%	1%	0.599	90%	0.000142	M	1.6%	0.94
			LED Traffic lights	0.00%	1%	0.000	90%	0.000142	M	1.6%	0.60
			Upgrade Ellipsoidal Reflector Lamp	0.01%	40%	0.025	30%	0.000142	O	6.0%	3.38
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	1.35%	10%	2.275	4%	0.000100	L	0.5%	1.48
			Ambient Sub-Cooling - oversized c	2.70%	10%	4.549	5%	0.000100	O	1.3%	1.42
			Economizer for Coolers	1.13%	20%	2.275	20%	0.000100	L	0.5%	5.95
			Evaporative Cooling	2.70%	35%	4.549	5%	0.000100	L	0.5%	4.30
			Evaporator Fan Controller	0.05%	10%	0.091	10%	0.000100	L	0.5%	6.63
			HE Compressors	2.70%	12%	4.549	8%	0.000100	O	2.0%	2.26
			Insulated Suction Lines	2.70%	75%	4.549	1%	0.000100	L	0.5%	1.13
			Liquid Pressure Amplifiers	2.70%	95%	4.549	5%	0.000100	L	0.5%	4.40
			Mechanical Subcooling - additional	2.70%	95%	4.549	5%	0.000100	L	0.5%	3.57
			Parallel Rack Systems	1.05%	10%	4.549	5%	0.000100	L	0.5%	4.30
			VSD on Refrigeration Circulating P	0.05%	10%	0.091	30%	0.000100	H	3.8%	1.29
			VSD on Refrigeration Fan	0.06%	25%	0.091	30%	0.000100	H	3.8%	2.38
		Refrig - RCx / controls	Anti-sweat heater controls	0.94%	24%	1.501	6%	0.000100	O	9.5%	4.12
			Case Lights-off timer (12am and 6a	0.50%	25%	1.501	3%	0.000100	M	1.6%	5.18
			Cooler/Freezer Door Auto Closers	0.75%	25%	2.275	4%	0.000100	H	3.8%	4.82
			Cooler/Freezer Door Gaskets	0.60%	25%	2.275	2%	0.000100	H	3.8%	3.40
			Cycle fan off with thermostat; duty c	0.90%	25%	4.549	5%	0.000100	M	1.6%	8.35
			Defrost Control System	2.70%	55%	4.549	3%	0.000100	L	0.5%	3.00
			Floating Head Pressure Control	2.25%	8%	4.549	7%	0.000100	M	1.6%	3.30
			Refrigeration E-Cube	2.85%	5%	4.549	2%	0.000100	H	3.8%	1.91
			Refrigeration System Maintenance	2.70%	8%	4.549	5%	0.000100	O	4.0%	4.30
			Strip Curtains	1.28%	12%	2.275	4%	0.000100	O	6.5%	4.82
		Lighting controls / design	Bi-level stairwell lighting	2.39%	30%	4.476	50%	0.000142	M	1.6%	1.65
			Daylighting controls	1.50%	1%	3.033	20%	0.000142	O	1.0%	0.81
			Exterior light timers	0.40%	95%	0.599	5%	0.000142	O	3.0%	2.07
			Occupancy Sensor	27.55%	26%	59.686	18%	0.000142	O	4.0%	4.54
			Scheduled interior lighting	39.36%	25%	59.686	5%	0.000142	L	0.5%	5.25

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Health Care	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	6.77%	68%	11.403	15%	0.000506	L	0.5%	2.29
			Desiccant Dehumidification	4.88%	5%	14.808	5%	0.000506	L	0.5%	0.47
			HE Chillers (air and water cooled)	6.77%	60%	11.403	15%	0.000506	M	1.6%	3.75
			HE Motors (VSDs, ECMs, on fans)	8.30%	28%	14.808	2%	0.000506	O	4.0%	4.90
			HE Rooftop AC systems	5.14%	10%	8.657	15%	0.000506	M	1.6%	7.72
			Ultraviolet A/C Coil Cleaning Syster	1.03%	25%	1.731	4%	0.000506	M	1.6%	1.37
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	7.14%	15%	11.403	5%	0.000506	L	0.5%	2.64
			Energy Management System	17.90%	10%	36.197	11%	0.000506	O	2.5%	2.60
			Guest room contls	0.00%	0%	2.411	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	23.87%	70%	36.197	8%	0.000506	O	2.5%	8.00
			HVAC System Retrocommissioning	22.68%	5%	36.197	15%	0.000506	O	2.5%	6.33
			Improve Duct Sealing	10.74%	15%	36.197	1%	0.000506	O	2.5%	9.44
			Insulate Pipes/Lines	23.87%	10%	36.197	1%	0.000506	O	2.5%	0.33
			Programmable Thermostat	8.35%	13%	36.197	4%	0.000506	O	2.5%	4.54
			Time Clock	23.87%	95%	36.197	4%	0.000506	O	2.5%	4.54
			Direct load control AC	0.00%	2%	0.000	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.07%	15%	0.136	60%	0.000142	M	1.6%	1.17
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.78%	20%	8.189	100%	0.000140	L	0.5%	1.63
			Grey Water Heat Exchanger	3.56%	8%	8.189	30%	0.000140	L	0.5%	3.07
			Heat Trap	3.56%	60%	8.189	5%	0.000140	M	1.6%	3.07
			Insulating Blankets	2.70%	65%	8.189	4%	0.000140	M	1.6%	2.88
			Pipe Insulation	0.41%	25%	0.819	1%	0.000140	M	1.6%	3.44
			Reduced Temperature Setpoints	3.56%	25%	8.189	19%	0.000140	O	2.5%	12.12
			Timers	3.56%	60%	8.189	5%	0.000140	O	2.5%	5.83
			Water Heater Cycling	3.56%	60%	8.189	5%	0.000140	O	2.5%	5.83
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.60%	20%	0.910	45%	0.000142	H	3.8%	4.91
			HE Battery Charging Station	0.10%	10%	0.152	35%	0.000142	M	1.6%	3.15
			Plug Load Sensors	0.10%	70%	0.152	20%	0.000142	L	0.5%	3.85
			Power Management Software	6.65%	35%	10.615	15%	0.000142	M	1.6%	3.31
		Faucets / Nozzles	Faucet Aerators	0.51%	40%	0.819	20%	0.000140	M	1.6%	4.09
			Low Flow Pre-Rinse Nozzles	0.24%	45%	0.819	55%	0.000140	M	1.6%	12.15
			Low Flow Showerhead	0.24%	15%	0.819	1%	0.000140	M	1.6%	4.73
			Ultrasonic Faucet Control	0.49%	10%	0.819	3%	0.000140	M	1.6%	2.18
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	2.124	100%	-	M	1.6%	1.70
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000140	M	1.6%	5.81
			Vendor Miser	0.01%	30%	0.018	46%	0.000142	M	1.6%	1.59
		Shell improvement	Shell: Insulating and Air Sealing	20.29%	15%	36.197	12%	0.000476	L	0.5%	2.50
			Shell: Reduced Solar Gain	20.29%	25%	36.197	9%	0.000476	M	1.6%	0.21
		Refrig - Displays	New case doors	0.28%	5%	0.450	10%	0.000100	O	6.5%	2.80
			Night Covers for Display Cases	0.94%	12%	1.501	6%	0.000100	H	3.8%	1.95
			Refrigerated Case Doors - Door Mis	0.94%	8%	1.501	10%	0.000100	H	3.8%	4.82
			Refrigerated Case Doors - Low/No	0.94%	5%	1.501	3%	0.000100	O	6.5%	9.78

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Health Care	ROB	Lighting equipment	CFL Screw in	1.23%	40%	1.287	71%	0.000142	L	0.5%	4.97
			HPT8 Fixture to replace T8	26.37%	10%	4.703	11%	0.000142	O	20.0%	0.78
			LED Refrigerated Case Door Lighti	0.00%	20%	0.000	25%	0.000142	H	12.5%	3.77
			LED Task Lighting	1.48%	2%	0.292	35%	0.000142	M	5.0%	0.65
		Refrig - Cooler/Freezer equip	ECM Motors on fans	2.25%	51%	0.383	7%	0.000100	O	6.3%	5.13
			Evaporative Cooling	2.70%	10%	0.535	5%	0.000100	L	0.5%	4.30
			HE Compressors	2.70%	12%	0.383	8%	0.000100	O	15.0%	8.31
			PSC Motors on fans	2.70%	31%	0.383	1%	0.000100	M	5.0%	1.16
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.05%	5%	0.011	65%	0.000142	L	0.5%	4.08
			HE Dishwashers	1.05%	20%	0.289	25%	0.000140	M	5.0%	0.91
		Cooling Equipment	HE Chillers (air and water cooled)	6.77%	33%	0.697	25%	0.000506	M	5.0%	2.86
			HE Packaged AC (non rooftop)	5.14%	25%	0.874	16%	0.000506	O	10.0%	5.84
			HE Rooftop AC systems	5.14%	10%	0.874	25%	0.000506	O	10.0%	6.08
			PTAC and PTHP	1.43%	15%	0.203	30%	0.000506	O	10.0%	1.47
			Geothermal Heat Pumps	0.14%	5%	0.191	36%	0.000506	O	5.0%	1.78
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.005	50%	0.000142	L	0.5%	4.87
			HE (ES) Fryers	0.02%	25%	0.005	15%	0.000142	L	0.5%	1.86
			HE (ES) Hot Food Holding Cabinet	0.05%	25%	0.011	60%	0.000142	L	0.5%	5.51
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.005	50%	0.000142	L	0.5%	4.87
			HE Broilers	0.03%	40%	0.005	18%	0.000142	L	0.5%	2.18
			HE Griddles	0.03%	40%	0.005	32%	0.000142	L	0.5%	3.51
			HE Induction Cooking	0.03%	25%	0.005	20%	0.000142	L	0.5%	2.39
			HE Ovens	0.03%	70%	0.005	2%	0.000142	L	0.5%	0.17
			Solid State Temperature Controls	0.01%	15%	0.001	15%	0.000142	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	5.40%	35%	0.963	5%	0.000140	M	5.0%	2.71
			Heat Pump Water Heating	3.56%	5%	0.963	59%	0.000140	M	5.0%	2.53
		Data / computing / office equip	HE (ES) Computers	7.00%	75%	1.703	25%	0.000142	M	5.0%	2.89
			HE (ES) Other Office Equipment	1.50%	65%	0.267	25%	0.000142	M	5.0%	3.31
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.096	8%	-	O	5.0%	4.30
		Process equip	HE (ES) Icemakers	0.30%	25%	0.053	25%	0.000142	L	0.5%	1.33
			HE (ES) Refrig. Bev. Vending Mach	0.01%	25%	0.002	20%	0.000142	M	5.0%	0.81
			HE (ES) Water Cooler	0.07%	25%	0.018	15%	0.000142	M	5.0%	0.27
			HE Commercial Clothes Dryers	0.20%	20%	0.036	10%	0.000142	M	5.0%	1.75
			HE Commercial Clothes Washers	0.20%	20%	0.036	35%	0.000142	M	5.0%	4.44
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000140	M	5.0%	1.12
		Clotheswashing	HE Clothes Washers	0.81%	20%	0.289	45%	0.000140	M	5.0%	0.62

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Lodging	NC	Pool	Solar Pool Heater	0.00%	0%	0.026	40%	0.000116	L	0.5%	1.05
		Lighting equipment	CFL Fixture	11.70%	50%	0.415	69%	0.000106	M	5.0%	5.85
			Electronic ballast	5.28%	90%	0.169	30%	0.000106	M	5.0%	3.82
			HPT8 Fixture to replace T8	10.72%	10%	0.343	11%	0.000106	O	30.0%	1.26
			LED Exterior Lighting	0.89%	1%	0.038	90%	0.000106	O	2.5%	1.19
			LED Task Lighting	7.20%	2%	0.256	35%	0.000106	O	2.5%	0.53
		Refrig - Cooler/Freezer equip	Economizer for Coolers	1.13%	20%	0.048	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	2.25%	16%	0.096	7%	0.000050	M	5.0%	4.17
		Lighting controls / design	Bi-level stairwell lighting	0.90%	30%	0.038	50%	0.000106	M	5.0%	6.54
			Efficient lighting design/layout	32.00%	30%	1.023	20%	0.000106	O	3.4%	4.66
		Cooling Equipment	Desiccant Dehumidification	16.28%	5%	0.693	5%	0.000583	L	0.5%	1.79
			Economizer	8.79%	84%	0.312	20%	0.000583	M	5.0%	7.17
		HVAC RCx / Controls	Energy Management System	9.28%	50%	0.312	10%	0.000583	M	5.0%	6.43
			HVAC System Commissioning	9.28%	5%	0.312	10%	0.000583	H	12.5%	5.32
			Thermal Energy Storage	6.15%	0%	0.262	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	1.08%	15%	0.230	5%	0.000116	M	5.0%	3.32
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000050	M	5.0%	28.30
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.24%	50%	0.008	40%	0.000106	H	12.5%	8.88
		Shell improvement	High performance integrated desig	7.32%	15%	0.312	30%	0.000583	H	12.5%	6.89
			Shell: Improved Insulation and Air	9.28%	65%	0.312	8%	0.000548	M	5.0%	10.04
			Shell: Reduced Solar Gain	8.79%	25%	0.312	11%	0.000548	H	12.5%	1.23

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Lodging	Retrofit	Pool	Pool Cover	0.72%	5%	1.453	60%	0.000116	M	1.6%	0.79
		Lighting equipment	Advanced Metal Halide	0.00%	15%	0.000	30%	0.000106	O	10.0%	2.33
			CFL Screw in	9.75%	40%	23.604	71%	0.000106	O	4.0%	4.84
			Electronic ballast	5.28%	90%	9.587	30%	0.000106	O	6.3%	1.27
			HE Halogen	3.00%	20%	7.263	30%	0.000106	M	1.6%	8.63
			HO T5 lamps	0.00%	5%	0.000	45%	0.000106	O	6.3%	3.65
			HPT8 Fixture to replace T12	5.82%	20%	10.570	28%	0.000106	O	6.3%	0.94
			Induction	1.07%	5%	2.152	10%	0.000106	O	6.3%	1.52
			LED Exit Lights	0.27%	60%	0.523	75%	0.000106	H	3.8%	2.02
			LED Exterior Lighting	0.89%	1%	2.152	90%	0.000106	M	1.6%	0.92
			LED Traffic lights	0.00%	1%	0.000	90%	0.000106	M	1.6%	0.58
			Upgrade Ellipsoidal Reflector Lamp	0.12%	70%	0.291	30%	0.000106	O	6.0%	3.29
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	1.35%	10%	2.724	4%	0.000050	L	0.5%	1.44
			Ambient Sub-Cooling - oversized c	2.70%	10%	5.447	5%	0.000050	O	1.3%	1.38
			Economizer for Coolers	1.13%	20%	2.724	20%	0.000050	L	0.5%	5.77
			Evaporative Cooling	2.70%	35%	5.447	5%	0.000050	L	0.5%	4.17
			Evaporator Fan Controller	0.05%	10%	0.109	10%	0.000050	L	0.5%	6.44
			HE Compressors	2.70%	12%	5.447	8%	0.000050	O	2.0%	2.19
			Insulated Suction Lines	2.70%	75%	5.447	1%	0.000050	L	0.5%	1.09
			Liquid Pressure Amplifiers	2.70%	95%	5.447	5%	0.000050	L	0.5%	4.27
			Mechanical Subcooling - additional	2.70%	95%	5.447	5%	0.000050	L	0.5%	3.46
			Parallel Rack Systems	1.05%	10%	5.447	5%	0.000050	L	0.5%	4.17
			VSD on Refrigeration Circulating P	0.05%	10%	0.109	30%	0.000050	H	3.8%	1.26
			VSD on Refrigeration Fan	0.06%	25%	0.109	30%	0.000050	H	3.8%	2.31
		Refrig - RCx / controls	Anti-sweat heater controls	0.94%	24%	1.798	6%	0.000050	O	9.5%	4.00
			Case Lights-off timer (12am and 6a	0.50%	25%	1.798	3%	0.000050	M	1.6%	5.02
			Cooler/Freezer Door Auto Closers	0.75%	25%	2.724	4%	0.000050	H	3.8%	4.68
			Cooler/Freezer Door Gaskets	0.60%	25%	2.724	2%	0.000050	H	3.8%	3.26
			Cycle fan off with thermostat; duty c	0.90%	25%	5.447	5%	0.000050	M	1.6%	8.10
			Defrost Control System	2.70%	55%	5.447	3%	0.000050	L	0.5%	2.92
			Floating Head Pressure Control	2.25%	8%	5.447	7%	0.000050	M	1.6%	3.21
			Refrigeration E-Cube	2.85%	5%	5.447	2%	0.000050	H	3.8%	1.85
			Refrigeration System Maintenance	2.70%	8%	5.447	5%	0.000050	O	4.0%	4.17
			Strip Curtains	1.28%	12%	2.724	4%	0.000050	O	6.5%	4.68
		Lighting controls / design	Bi-level stairwell lighting	0.90%	71%	2.179	50%	0.000106	M	1.6%	1.60
			Daylighting controls	4.50%	1%	10.894	20%	0.000106	O	1.0%	0.79
			Exterior light timers	1.19%	95%	2.152	25%	0.000106	O	3.0%	6.66
			Occupancy Sensor	11.20%	26%	29.051	18%	0.000106	O	4.0%	4.42
			Scheduled interior lighting	15.20%	25%	29.051	0%	-	L	0.5%	0.00

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Lodging	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	3.67%	68%	7.408	15%	0.000583	M	1.6%	2.37
			Desiccant Dehumidification	10.85%	5%	39.401	5%	0.000583	L	0.5%	0.49
			HE Chillers (air and water cooled)	3.67%	60%	7.408	15%	0.000583	H	3.8%	3.89
			HE Motors (VSDs, ECMs, on fans)	18.45%	28%	39.401	2%	0.000583	O	4.0%	5.08
			HE Rooftop AC systems	3.61%	10%	7.281	15%	0.000583	M	1.6%	8.00
			Ultraviolet A/C Coil Cleaning Syster	0.72%	25%	1.453	4%	0.000583	M	1.6%	1.42
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	3.88%	15%	7.408	5%	0.000583	M	1.6%	2.73
			Energy Management System	7.32%	10%	17.730	11%	0.000583	O	2.5%	2.62
			Guest room contls	4.06%	5%	8.189	30%	0.000583	M	1.6%	2.70
			HVAC System maintenance (servic	9.77%	20%	17.730	8%	0.000583	O	2.5%	8.06
			HVAC System Retrocommissioning	9.28%	5%	17.730	15%	0.000583	O	2.5%	6.42
			Improve Duct Sealing	4.39%	15%	17.730	1%	0.000583	O	2.5%	9.60
			Insulate Pipes/Lines	9.77%	10%	17.730	1%	0.000583	O	2.5%	0.34
			Programmable Thermostat	3.42%	13%	17.730	4%	0.000583	O	2.5%	4.58
			Time Clock	9.77%	95%	17.730	4%	0.000583	O	2.5%	4.58
			Direct load control AC	5.79%	2%	14.007	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.07%	15%	0.163	60%	0.000106	M	1.6%	1.15
		DHW System improvements	DHW Fuel Switching (elec to gas)	2.38%	20%	13.073	100%	0.000116	L	0.5%	0.72
			Grey Water Heat Exchanger	4.75%	8%	13.073	50%	0.000116	M	1.6%	1.13
			Heat Trap	4.75%	60%	13.073	5%	0.000116	M	1.6%	1.13
			Insulating Blankets	3.60%	65%	13.073	4%	0.000116	M	1.6%	1.03
			Pipe Insulation	0.54%	25%	1.307	1%	0.000116	M	1.6%	1.27
			Reduced Temperature Setpoints	4.75%	65%	13.073	19%	0.000116	O	2.5%	8.87
			Timers	4.75%	60%	13.073	5%	0.000116	O	2.5%	2.53
			Water Heater Cycling	4.75%	60%	13.073	5%	0.000116	O	2.5%	2.53
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.24%	20%	0.436	45%	0.000106	H	3.8%	4.82
			HE Battery Charging Station	0.06%	10%	0.109	35%	0.000106	M	1.6%	3.06
			Plug Load Sensors	2.70%	70%	4.902	20%	0.000106	L	0.5%	3.75
			Power Management Software	0.57%	25%	1.089	15%	0.000106	M	1.6%	3.22
		Faucets / Nozzles	Faucet Aerators	0.68%	40%	1.307	20%	0.000116	M	1.6%	2.84
			Low Flow Pre-Rinse Nozzles	0.32%	45%	1.307	55%	0.000116	M	1.6%	7.79
			Low Flow Showerhead	0.32%	15%	1.307	9%	0.000116	M	1.6%	1.92
			Ultrasonic Faucet Control	0.65%	15%	1.307	3%	0.000116	M	1.6%	0.77
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	2.544	100%	-	M	1.6%	1.70
		Process equip	TOD Pool Pump Timer	0.80%	5%	1.453	10%	0.000116	M	1.6%	2.42
			Vendor Miser	0.01%	30%	0.022	46%	0.000106	M	1.6%	1.56
		Shell improvement	Shell: Insulating and Air Sealing	8.30%	15%	17.730	12%	0.000548	L	0.5%	3.10
			Shell: Reduced Solar Gain	8.30%	25%	17.730	11%	0.000548	M	1.6%	0.07
		Refrig - Displays	New case doors	0.28%	5%	0.539	10%	0.000050	O	6.5%	2.72
			Night Covers for Display Cases	0.94%	12%	1.798	6%	0.000050	H	3.8%	1.89
			Refrigerated Case Doors - Door Mis	0.94%	8%	1.798	10%	0.000050	H	3.8%	4.68
			Refrigerated Case Doors - Low/No	0.94%	5%	1.798	3%	0.000050	O	6.5%	9.49

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Lodging	ROB	Lighting equipment	CFL Screw in	9.75%	40%	12.218	71%	0.000106	M	5.0%	4.84
			HPT8 Fixture to replace T8	10.72%	5%	2.289	11%	0.000106	O	20.0%	0.75
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000106	H	12.5%	3.67
			LED Task Lighting	7.20%	2%	1.708	35%	0.000106	M	5.0%	0.63
		Refrig - Cooler/Freezer equip	ECM Motors on fans	2.25%	51%	0.459	7%	0.000050	O	6.3%	4.98
			Evaporative Cooling	2.70%	10%	0.641	5%	0.000050	L	0.5%	4.17
			HE Compressors	2.70%	12%	0.459	8%	0.000050	O	15.0%	8.06
			PSC Motors on fans	2.70%	31%	0.459	1%	0.000050	M	5.0%	1.12
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.05%	5%	0.013	65%	0.000106	L	0.5%	4.00
			HE Dishwashers	1.40%	20%	0.461	25%	0.000116	M	5.0%	0.90
		Cooling Equipment	HE Chillers (air and water cooled)	3.67%	33%	0.452	25%	0.000583	H	12.5%	2.97
			HE Packaged AC (non rooftop)	3.61%	25%	0.735	16%	0.000583	O	10.0%	6.05
			HE Rooftop AC systems	3.61%	10%	0.735	25%	0.000583	O	10.0%	6.30
			PTAC and PTHP	4.06%	15%	0.690	30%	0.000583	O	10.0%	1.52
			Geothermal Heat Pumps	0.07%	5%	0.111	36%	0.000583	O	5.0%	1.80
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.006	50%	0.000106	L	0.5%	4.78
			HE (ES) Fryers	0.02%	25%	0.006	15%	0.000106	L	0.5%	1.83
			HE (ES) Hot Food Holding Cabinet	0.05%	25%	0.013	60%	0.000106	L	0.5%	5.40
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.006	50%	0.000106	L	0.5%	4.78
			HE Broilers	0.03%	25%	0.006	18%	0.000106	L	0.5%	2.14
			HE Griddles	0.03%	40%	0.006	32%	0.000106	L	0.5%	3.44
			HE Induction Cooking	0.03%	25%	0.006	20%	0.000106	L	0.5%	2.34
			HE Ovens	0.03%	72%	0.006	2%	0.000106	L	0.5%	0.16
			Solid State Temperature Controls	0.01%	15%	0.001	15%	0.000106	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	7.20%	35%	1.537	5%	0.000116	M	5.0%	2.68
			Heat Pump Water Heating	3.56%	5%	1.153	59%	0.000116	M	5.0%	0.91
		Data / computing / office equip	HE (ES) Computers	0.60%	75%	0.175	25%	0.000106	M	5.0%	2.82
			HE (ES) Other Office Equipment	0.60%	65%	0.128	25%	0.000106	M	5.0%	3.22
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.115	8%	-	O	5.0%	4.30
		Process equip	HE (ES) Icemakers	1.20%	25%	0.256	25%	0.000106	L	0.5%	1.30
			HE (ES) Refrig. Bev. Vending Mach	0.00%	25%	0.003	20%	0.000106	M	5.0%	0.79
			HE (ES) Water Cooler	0.04%	25%	0.013	15%	0.000106	M	5.0%	0.27
			HE Commercial Clothes Dryers	0.30%	20%	0.064	10%	0.000106	M	5.0%	1.70
			HE Commercial Clothes Washers	0.30%	43%	0.064	35%	0.000106	M	5.0%	4.32
			Low Pressure Drop Pool Filter	0.72%	5%	1.478	5%	0.000116	M	5.0%	0.37
		Clotheswashing	HE Clothes Washers	1.08%	20%	0.461	45%	0.000116	M	5.0%	0.62

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Mercantile	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000182	L	0.5%	1.57
		Lighting equipment	CFL Fixture	7.20%	50%	0.385	69%	0.000178	M	5.0%	4.26
			Electronic ballast	12.58%	90%	0.605	30%	0.000178	M	5.0%	2.36
			HPT8 Fixture to replace T8	20.00%	10%	0.962	11%	0.000178	O	30.0%	0.68
			LED Exterior Lighting	1.04%	1%	0.067	90%	0.000178	O	2.5%	0.62
			LED Task Lighting	2.21%	2%	0.118	35%	0.000178	O	2.5%	0.28
		Refrig - Cooler/Freezer equip	Economizer for Coolers	3.38%	20%	0.216	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	6.75%	16%	0.433	7%	0.000080	M	5.0%	2.44
		Lighting controls / design	Bi-level stairwell lighting	1.72%	20%	0.138	50%	0.000178	M	5.0%	4.76
			Efficient lighting design/layout	41.00%	30%	1.973	20%	0.000178	O	3.4%	3.02
		Cooling Equipment	Desiccant Dehumidification	9.77%	5%	0.626	5%	0.000718	L	0.5%	0.97
			Economizer	15.62%	84%	0.835	20%	0.000718	M	5.0%	4.72
		HVAC RCx / Controls	Energy Management System	29.89%	50%	1.514	10%	0.000718	M	5.0%	3.18
			HVAC System Commissioning	29.89%	5%	1.514	10%	0.000718	H	12.5%	2.80
			Thermal Energy Storage	9.21%	0%	0.591	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.68%	15%	0.216	5%	0.000182	M	5.0%	3.45
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000080	M	5.0%	13.74
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.08%	50%	0.004	40%	0.000178	H	12.5%	6.34
		Shell improvement	High performance integrated desig	23.60%	15%	1.514	30%	0.000718	H	12.5%	3.55
			Shell: Improved Insulation and Air	29.89%	65%	1.514	8%	0.000675	M	5.0%	5.42
			Shell: Reduced Solar Gain	28.32%	25%	1.514	4%	0.000675	H	12.5%	1.92

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Mercantile	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000182	M	1.6%	1.22
		Lighting equipment	Advanced Metal Halide	2.00%	15%	10.934	30%	0.000178	O	10.0%	1.33
			CFL Screw in	6.00%	40%	21.868	71%	0.000178	O	4.0%	3.10
			Electronic ballast	12.58%	90%	34.396	30%	0.000178	O	6.3%	0.69
			HE Halogen	1.85%	20%	6.724	30%	0.000178	M	1.6%	7.27
			HO T5 lamps	0.31%	10%	1.121	45%	0.000178	O	6.3%	2.23
			HPT8 Fixture to replace T12	13.87%	5%	37.921	28%	0.000178	O	6.3%	0.99
			Induction	1.24%	5%	3.780	10%	0.000178	O	6.3%	0.80
			LED Exit Lights	0.35%	60%	1.009	75%	0.000178	H	3.8%	1.14
			LED Exterior Lighting	1.04%	1%	3.780	90%	0.000178	M	1.6%	0.48
			LED Traffic lights	0.00%	1%	0.000	90%	0.000178	M	1.6%	0.30
			Upgrade Ellipsoidal Reflector Lamp	0.75%	80%	2.734	30%	0.000178	O	6.0%	1.98
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	4.05%	10%	12.301	4%	0.000080	L	0.5%	0.75
			Ambient Sub-Cooling - oversized c	8.10%	10%	24.602	5%	0.000080	O	1.3%	0.72
			Economizer for Coolers	3.38%	20%	12.301	20%	0.000080	L	0.5%	3.74
			Evaporative Cooling	8.10%	35%	24.602	5%	0.000080	L	0.5%	2.44
			Evaporator Fan Controller	0.16%	10%	0.492	10%	0.000080	L	0.5%	4.17
			HE Compressors	8.10%	12%	24.602	8%	0.000080	O	2.0%	1.19
			Insulated Suction Lines	8.10%	75%	24.602	1%	0.000080	L	0.5%	0.56
			Liquid Pressure Amplifiers	8.10%	95%	24.602	5%	0.000080	L	0.5%	2.51
			Mechanical Subcooling - additional	8.10%	95%	24.602	5%	0.000080	L	0.5%	1.96
			Parallel Rack Systems	3.15%	10%	24.602	5%	0.000080	L	0.5%	2.44
			VSD on Refrigeration Circulating P	0.14%	10%	0.492	30%	0.000080	H	3.8%	0.65
			VSD on Refrigeration Fan	0.17%	25%	0.492	30%	0.000080	H	3.8%	1.25
		Refrig - RCx / controls	Anti-sweat heater controls	2.82%	24%	8.119	6%	0.000080	O	9.5%	2.32
			Case Lights-off timer (12am and 6a	1.49%	25%	8.119	3%	0.000080	M	1.6%	2.94
			Cooler/Freezer Door Auto Closers	2.25%	25%	12.301	4%	0.000080	H	3.8%	2.73
			Cooler/Freezer Door Gaskets	1.80%	25%	12.301	2%	0.000080	H	3.8%	1.92
			Cycle fan off with thermostat; duty c	2.70%	25%	24.602	5%	0.000080	M	1.6%	5.45
			Defrost Control System	8.10%	55%	24.602	3%	0.000080	L	0.5%	1.62
			Floating Head Pressure Control	6.75%	8%	24.602	7%	0.000080	M	1.6%	1.80
			Refrigeration E-Cube	8.55%	5%	24.602	2%	0.000080	H	3.8%	0.99
			Refrigeration System Maintenance	8.10%	8%	24.602	5%	0.000080	O	4.0%	2.44
			Strip Curtains	3.83%	12%	12.301	4%	0.000080	O	6.5%	2.73
		Lighting controls / design	Bi-level stairwell lighting	1.72%	10%	7.817	50%	0.000178	M	1.6%	0.88
			Daylighting controls	5.25%	1%	19.135	20%	0.000178	O	1.0%	0.42
			Exterior light timers	1.38%	95%	3.780	25%	0.000178	O	3.0%	5.73
			Occupancy Sensor	26.69%	26%	104.230	2%	0.000178	O	4.0%	1.50
			Scheduled interior lighting	36.22%	25%	104.230	10%	0.000178	L	0.5%	3.66

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Mercantile	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	4.29%	4%	13.039	15%	0.000718	M	1.6%	1.32
			Desiccant Dehumidification	6.51%	5%	35.591	5%	0.000718	L	0.5%	0.25
			HE Chillers (air and water cooled)	4.29%	60%	13.039	15%	0.000718	H	3.8%	2.32
			HE Motors (VSDs, ECMs, on fans)	11.07%	28%	35.591	2%	0.000718	O	4.0%	3.03
			HE Rooftop AC systems	6.98%	10%	21.185	15%	0.000718	M	1.6%	5.45
			Ultraviolet A/C Coil Cleaning Syster	1.40%	25%	4.237	4%	0.000718	M	1.6%	0.76
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	4.53%	15%	13.039	5%	0.000718	M	1.6%	1.52
			Energy Management System	23.60%	10%	86.011	11%	0.000718	O	2.5%	1.31
			Guest room contls	0.00%	0%	5.904	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	31.47%	20%	86.011	8%	0.000718	O	2.5%	4.11
			HVAC System Retrocommissioning	29.89%	5%	86.011	15%	0.000718	O	2.5%	3.45
			Improve Duct Sealing	14.16%	15%	86.011	1%	0.000718	O	2.5%	5.47
			Insulate Pipes/Lines	31.47%	10%	86.011	1%	0.000718	O	2.5%	0.18
			Programmable Thermostat	11.01%	13%	86.011	4%	0.000718	O	2.5%	2.31
			Time Clock	31.47%	95%	86.011	4%	0.000718	O	2.5%	2.31
			Direct load control AC	10.29%	2%	37.489	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.11%	15%	0.410	60%	-	M	1.6%	0.00
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.49%	20%	12.301	100%	0.000182	L	0.5%	1.16
			Grey Water Heat Exchanger	2.97%	8%	12.301	5%	0.000182	L	0.5%	1.73
			Heat Trap	2.97%	60%	12.301	5%	0.000182	M	1.6%	1.73
			Insulating Blankets	2.25%	65%	12.301	4%	0.000182	M	1.6%	1.59
			Pipe Insulation	0.34%	25%	1.230	1%	0.000182	M	1.6%	1.94
			Reduced Temperature Setpoints	2.97%	50%	12.301	19%	0.000182	O	2.5%	10.61
			Timers	2.97%	60%	12.301	5%	0.000182	O	2.5%	3.68
			Water Heater Cycling	2.97%	60%	12.301	5%	0.000182	O	2.5%	3.68
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.08%	20%	0.219	45%	0.000178	H	3.8%	2.89
			HE Battery Charging Station	0.02%	10%	0.055	35%	0.000178	M	1.6%	1.82
			Plug Load Sensors	0.90%	70%	2.460	20%	0.000178	L	0.5%	2.31
			Power Management Software	0.19%	25%	0.547	15%	0.000178	M	1.6%	1.93
		Faucets / Nozzles	Faucet Aerators	0.43%	40%	1.230	20%	0.000182	M	1.6%	4.13
			Low Flow Pre-Rinse Nozzles	0.20%	45%	1.230	55%	0.000182	M	1.6%	9.85
			Low Flow Showerhead	0.20%	15%	1.230	1%	0.000182	M	1.6%	2.85
			Ultrasonic Faucet Control	0.41%	15%	1.230	3%	0.000182	M	1.6%	1.19
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	3.830	100%	-	M	1.6%	1.62
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000182	M	1.6%	3.56
			Vendor Miser	0.02%	30%	0.055	46%	0.000178	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	26.75%	15%	86.011	12%	0.000675	L	0.5%	1.67
			Shell: Reduced Solar Gain	26.75%	25%	86.011	4%	0.000675	M	1.6%	0.12
		Refrig - Displays	New case doors	0.85%	5%	2.436	10%	0.000080	O	6.5%	1.50
			Night Covers for Display Cases	2.82%	12%	8.119	6%	0.000080	H	3.8%	1.00
			Refrigerated Case Doors - Door Mis	2.82%	8%	8.119	10%	0.000080	H	3.8%	2.73
			Refrigerated Case Doors - Low/No	2.82%	5%	8.119	3%	0.000080	O	6.5%	7.36

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Mercantile	ROB	Lighting equipment	CFL Screw in	6.00%	40%	11.319	71%	0.000178	M	5.0%	3.10
			HPT8 Fixture to replace T8	20.00%	5%	6.429	11%	0.000178	O	20.0%	0.40
			LED Refrigerated Case Door Lighti	0.00%	20%	0.000	25%	0.000178	H	12.5%	2.36
			LED Task Lighting	2.21%	2%	0.791	35%	0.000178	M	5.0%	0.33
		Refrig - Cooler/Freezer equip	ECM Motors on fans	6.75%	51%	2.073	7%	0.000080	O	6.3%	3.10
			Evaporative Cooling	8.10%	10%	2.893	5%	0.000080	L	0.5%	2.44
			HE Compressors	8.10%	12%	2.073	8%	0.000080	O	15.0%	5.95
			PSC Motors on fans	8.10%	31%	2.073	1%	0.000080	M	5.0%	0.58
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.09%	5%	0.032	65%	-	L	0.5%	0.00
			HE Dishwashers	0.00%	20%	0.000	25%	0.000182	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	4.29%	33%	0.796	25%	0.000718	H	12.5%	1.71
			HE Packaged AC (non rooftop)	6.98%	25%	2.138	16%	0.000718	O	10.0%	3.82
			HE Rooftop AC systems	6.98%	10%	2.138	25%	0.000718	O	10.0%	4.01
			PTAC and PTHP	1.94%	15%	0.498	30%	0.000718	O	10.0%	0.82
			Geothermal Heat Pumps	0.07%	5%	0.173	36%	0.000718	O	5.0%	1.53
		Process equip: cooking	Connectionless (Boilerless) Steame	0.04%	25%	0.016	50%	-	L	0.5%	0.00
			HE (ES) Fryers	0.03%	25%	0.016	15%	-	L	0.5%	0.00
			HE (ES) Hot Food Holding Cabinet	0.09%	25%	0.032	60%	-	L	0.5%	0.00
			HE (ES) Steam Cookers / Steamer	0.04%	25%	0.016	50%	-	L	0.5%	0.00
			HE Broilers	0.05%	40%	0.016	18%	-	L	0.5%	0.00
			HE Griddles	0.05%	40%	0.016	32%	-	L	0.5%	0.00
			HE Induction Cooking	0.05%	25%	0.016	20%	-	L	0.5%	0.00
			HE Ovens	0.05%	33%	0.016	2%	0.000178	L	0.5%	0.08
			Solid State Temperature Controls	0.01%	15%	0.003	15%	-	M	5.0%	0.00
		DHW System improvements	HE Water Heaters	4.50%	35%	1.447	5%	0.000182	M	5.0%	2.78
			Heat Pump Water Heating	3.56%	5%	1.736	59%	0.000182	M	5.0%	1.39
		Data / computing / office equip	HE (ES) Computers	0.20%	75%	0.088	25%	0.000178	M	5.0%	1.65
			HE (ES) Other Office Equipment	0.20%	65%	0.064	25%	0.000178	M	5.0%	1.93
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.173	8%	-	O	5.0%	2.68
		Process equip	HE (ES) Icemakers	0.40%	25%	0.129	25%	0.000178	L	0.5%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.01%	25%	0.006	20%	0.000178	M	5.0%	0.82
			HE (ES) Water Cooler	0.01%	25%	0.006	15%	0.000178	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.10%	20%	0.032	10%	-	M	5.0%	0.00
			HE Commercial Clothes Washers	0.10%	43%	0.032	35%	-	M	5.0%	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000182	M	5.0%	0.58
		Clotheswashing	HE Clothes Washers	0.00%	20%	0.000	45%	0.000182	M	5.0%	0.64

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	NC	Pool	Solar Pool Heater	0.00%	0%	0.014	40%	0.000180	L	0.5%	1.09
		Lighting equipment	CFL Fixture	1.03%	50%	0.082	69%	0.000189	M	5.0%	3.30
			Electronic ballast	12.04%	90%	0.867	30%	0.000189	M	5.0%	1.70
			HPT8 Fixture to replace T8	24.44%	10%	1.760	11%	0.000189	O	30.0%	0.47
			LED Exterior Lighting	0.59%	1%	0.057	90%	0.000189	O	2.5%	0.42
			LED Task Lighting	1.03%	2%	0.082	35%	0.000189	O	2.5%	0.19
		Refrig - Cooler/Freezer equip	Economizer for Coolers	0.38%	20%	0.036	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	0.75%	16%	0.072	7%	0.000067	M	5.0%	1.69
		Lighting controls / design	Bi-level stairwell lighting	2.24%	30%	0.197	50%	0.000189	M	5.0%	3.69
			Efficient lighting design/layout	38.00%	30%	2.736	20%	0.000189	O	3.4%	2.22
		Cooling Equipment	Desiccant Dehumidification	10.58%	5%	1.015	5%	0.000490	L	0.5%	0.60
			Economizer	8.79%	84%	0.703	20%	0.000490	M	5.0%	3.12
		HVAC RCx / Controls	Energy Management System	23.71%	50%	1.797	10%	0.000490	M	5.0%	2.18
			HVAC System Commissioning	23.71%	5%	1.797	10%	0.000490	H	12.5%	1.86
			Thermal Energy Storage	6.15%	0%	0.590	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.27%	15%	0.130	5%	0.000180	M	5.0%	3.44
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000067	M	5.0%	9.45
		Data / computing / office equip	Energy Efficient Data Centers (virtu	3.75%	50%	0.270	40%	0.000189	H	12.5%	5.00
		Shell improvement	High performance integrated desig	18.72%	15%	1.797	30%	0.000490	H	12.5%	2.41
			Shell: Improved Insulation and Air	23.71%	65%	1.797	8%	0.000461	M	5.0%	3.71
			Shell: Reduced Solar Gain	22.46%	25%	1.797	10%	0.000461	H	12.5%	1.18

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	Retrofit	Pool	Pool Cover	0.18%	5%	0.818	60%	0.000180	M	1.6%	0.82
		Lighting equipment	Advanced Metal Halide	0.19%	15%	1.554	30%	0.000189	O	10.0%	0.93
			CFL Screw in	0.86%	40%	4.663	71%	0.000189	O	4.0%	2.26
			Electronic ballast	12.04%	90%	49.241	30%	0.000189	O	6.3%	0.47
			HE Halogen	0.86%	20%	4.663	30%	0.000189	M	1.6%	6.14
			HO T5 lamps	0.29%	40%	1.554	45%	0.000189	O	6.3%	1.60
			HPT8 Fixture to replace T12	13.27%	40%	54.288	28%	0.000189	O	6.3%	1.00
			Induction	0.71%	5%	3.232	10%	0.000189	O	6.3%	0.55
			LED Exit Lights	0.16%	60%	0.699	75%	0.000189	H	3.8%	0.79
			LED Exterior Lighting	0.59%	1%	3.232	90%	0.000189	M	1.6%	0.32
			LED Traffic lights	0.00%	1%	0.000	90%	0.000189	M	1.6%	0.28
			Upgrade Ellipsoidal Reflector Lamp	0.01%	80%	0.047	30%	0.000189	O	6.0%	1.41
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	0.45%	10%	2.045	4%	0.000067	L	0.5%	0.50
			Ambient Sub-Cooling - oversized c	0.90%	10%	4.090	5%	0.000067	O	1.3%	0.48
			Economizer for Coolers	0.38%	20%	2.045	20%	0.000067	L	0.5%	2.71
			Evaporative Cooling	0.90%	35%	4.090	5%	0.000067	L	0.5%	1.69
			Evaporator Fan Controller	0.02%	10%	0.082	10%	0.000067	L	0.5%	3.02
			HE Compressors	0.90%	12%	4.090	8%	0.000067	O	2.0%	0.80
			Insulated Suction Lines	0.90%	75%	4.090	1%	0.000067	L	0.5%	0.37
			Liquid Pressure Amplifiers	0.90%	95%	4.090	5%	0.000067	L	0.5%	1.74
			Mechanical Subcooling - additional	0.90%	95%	4.090	5%	0.000067	L	0.5%	1.34
			Parallel Rack Systems	0.35%	10%	4.090	5%	0.000067	L	0.5%	1.69
			VSD on Refrigeration Circulating P	0.02%	10%	0.082	30%	0.000067	H	3.8%	0.43
			VSD on Refrigeration Fan	0.02%	25%	0.082	30%	0.000067	H	3.8%	0.84
		Refrig - RCx / controls	Anti-sweat heater controls	0.31%	24%	1.350	6%	0.000067	O	9.5%	1.60
			Case Lights-off timer (12am and 6a	0.17%	25%	1.350	3%	0.000067	M	1.6%	2.03
			Cooler/Freezer Door Auto Closers	0.25%	25%	2.045	4%	0.000067	H	3.8%	1.89
			Cooler/Freezer Door Gaskets	0.20%	25%	2.045	2%	0.000067	H	3.8%	1.33
			Cycle fan off with thermostat; duty c	0.30%	25%	4.090	5%	0.000067	M	1.6%	4.02
			Defrost Control System	0.90%	55%	4.090	3%	0.000067	L	0.5%	1.10
			Floating Head Pressure Control	0.75%	8%	4.090	7%	0.000067	M	1.6%	1.23
			Refrigeration E-Cube	0.95%	5%	4.090	2%	0.000067	H	3.8%	0.66
			Refrigeration System Maintenance	0.90%	8%	4.090	5%	0.000067	O	4.0%	1.69
			Strip Curtains	0.43%	12%	2.045	4%	0.000067	O	6.5%	1.89
		Lighting controls / design	Bi-level stairwell lighting	2.24%	30%	11.191	50%	0.000189	M	1.6%	0.61
			Daylighting controls	3.00%	1%	16.361	20%	0.000189	O	1.0%	0.29
			Exterior light timers	0.79%	95%	3.232	25%	0.000189	O	3.0%	4.36
			Occupancy Sensor	25.54%	26%	149.215	18%	0.000189	O	4.0%	3.37
			Scheduled interior lighting	34.66%	25%	149.215	10%	0.000189	L	0.5%	2.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	2.81%	16%	12.762	15%	0.000490	M	1.6%	0.82
			Desiccant Dehumidification	7.05%	5%	57.694	5%	0.000490	L	0.5%	0.15
			HE Chillers (air and water cooled)	2.81%	60%	12.762	15%	0.000490	H	3.8%	1.47
			HE Motors (VSDs, ECMs, on fans)	11.99%	28%	57.694	2%	0.000490	O	4.0%	1.92
			HE Rooftop AC systems	3.78%	10%	17.179	15%	0.000490	M	1.6%	3.74
			Ultraviolet A/C Coil Cleaning Syster	0.76%	25%	3.436	4%	0.000490	M	1.6%	0.47
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	2.96%	15%	12.762	5%	0.000490	M	1.6%	0.94
			Energy Management System	18.72%	10%	102.074	11%	0.000490	O	2.5%	0.88
			Guest room contls	0.00%	0%	4.786	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	24.96%	50%	102.074	8%	0.000490	O	2.5%	2.79
			HVAC System Retrocommissioning	23.71%	5%	102.074	15%	0.000490	O	2.5%	2.30
			Improve Duct Sealing	11.23%	15%	102.074	1%	0.000490	O	2.5%	3.70
			Insulate Pipes/Lines	24.96%	10%	102.074	1%	0.000490	O	2.5%	0.11
			Programmable Thermostat	8.73%	13%	102.074	10%	0.000490	O	2.5%	1.56
			Time Clock	24.96%	95%	102.074	4%	0.000490	O	2.5%	1.56
			Direct load control AC	5.79%	2%	31.554	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.00%	15%	0.000	60%	-	M	1.6%	0.00
		DHW System improvements	DHW Fuel Switching (elec to gas)	0.59%	20%	7.363	100%	0.000180	L	0.5%	0.85
			Grey Water Heat Exchanger	1.19%	8%	7.363	10%	0.000180	L	0.5%	1.18
			Heat Trap	1.19%	60%	7.363	5%	0.000180	M	1.6%	1.18
			Insulating Blankets	0.90%	65%	7.363	4%	0.000180	M	1.6%	1.07
			Pipe Insulation	0.14%	25%	0.736	1%	0.000180	M	1.6%	1.32
			Reduced Temperature Setpoints	1.19%	65%	7.363	19%	0.000180	O	2.5%	9.20
			Timers	1.19%	60%	7.363	5%	0.000180	O	2.5%	2.63
			Water Heater Cycling	1.19%	60%	7.363	5%	0.000180	O	2.5%	2.63
		Data / computing / office equip	Energy Efficient Data Centers (virtu	3.75%	20%	15.339	45%	0.000189	H	3.8%	2.12
			HE Battery Charging Station	0.50%	10%	2.045	35%	0.000189	M	1.6%	1.33
			Plug Load Sensors	0.50%	70%	2.045	20%	0.000189	L	0.5%	1.70
			Power Management Software	13.06%	25%	56.242	15%	0.000189	M	1.6%	1.41
		Faucets / Nozzles	Faucet Aerators	0.17%	40%	0.736	20%	0.000180	M	1.6%	5.00
			Low Flow Pre-Rinse Nozzles	0.08%	45%	0.736	55%	0.000180	M	1.6%	8.09
			Low Flow Showerhead	0.08%	15%	0.736	1%	0.000180	M	1.6%	1.99
			Ultrasonic Faucet Control	0.16%	15%	0.736	3%	0.000180	M	1.6%	0.80
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	5.731	100%	-	M	1.6%	1.54
		Process equip	TOD Pool Pump Timer	0.20%	5%	0.818	10%	0.000180	M	1.6%	2.51
			Vendor Miser	1.00%	30%	4.090	46%	0.000189	M	1.6%	1.63
		Shell improvement	Shell: Insulating and Air Sealing	21.21%	15%	102.074	12%	0.000461	L	0.5%	1.13
			Shell: Reduced Solar Gain	21.21%	25%	102.074	10%	0.000461	M	1.6%	0.07
		Refrig - Displays	New case doors	0.09%	5%	0.405	10%	0.000067	O	6.5%	1.02
			Night Covers for Display Cases	0.31%	12%	1.350	6%	0.000067	H	3.8%	0.66
			Refrigerated Case Doors - Door Mis	0.31%	8%	1.350	10%	0.000067	H	3.8%	1.89
			Refrigerated Case Doors - Low/No	0.31%	5%	1.350	3%	0.000067	O	6.5%	5.88

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Office	ROB	Lighting equipment	CFL Screw in	0.86%	40%	2.414	71%	0.000189	M	5.0%	2.26
			HPT8 Fixture to replace T8	24.44%	15%	11.757	11%	0.000189	O	20.0%	0.27
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000189	H	12.5%	1.73
			LED Task Lighting	1.03%	2%	0.548	35%	0.000189	M	5.0%	0.23
		Refrig - Cooler/Freezer equip	ECM Motors on fans	0.75%	51%	0.345	7%	0.000067	O	6.3%	2.20
			Evaporative Cooling	0.90%	10%	0.481	5%	0.000067	L	0.5%	1.69
			HE Compressors	0.90%	12%	0.345	8%	0.000067	O	15.0%	4.61
			PSC Motors on fans	0.90%	31%	0.345	1%	0.000067	M	5.0%	0.39
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.00%	5%	0.000	65%	-	L	0.5%	0.00
			HE Dishwashers	0.00%	75%	0.000	25%	0.000180	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	2.81%	33%	0.779	25%	0.000490	H	12.5%	1.07
			HE Packaged AC (non rooftop)	3.78%	25%	1.734	16%	0.000490	O	10.0%	2.47
			HE Rooftop AC systems	3.78%	10%	1.734	25%	0.000490	O	10.0%	2.68
			PTAC and PTHP	1.05%	15%	0.403	30%	0.000490	O	10.0%	0.52
			Geothermal Heat Pumps	0.08%	5%	0.283	36%	0.000490	O	5.0%	1.41
		Process equip: cooking	Connectionless (Boilerless) Steame	0.00%	25%	0.000	50%	-	L	0.5%	0.00
			HE (ES) Fryers	0.00%	25%	0.000	15%	-	L	0.5%	0.00
			HE (ES) Hot Food Holding Cabinet	0.00%	25%	0.000	60%	-	L	0.5%	0.00
			HE (ES) Steam Cookers / Steamer	0.00%	25%	0.000	50%	-	L	0.5%	0.00
			HE Broilers	0.00%	40%	0.000	18%	-	L	0.5%	0.00
			HE Griddles	0.00%	40%	0.000	32%	-	L	0.5%	0.00
			HE Induction Cooking	0.00%	25%	0.000	20%	-	L	0.5%	0.00
			HE Ovens	0.00%	33%	0.000	2%	0.000189	L	0.5%	0.06
			Solid State Temperature Controls	0.00%	15%	0.000	15%	0.000189	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	1.80%	35%	0.866	5%	0.000180	M	5.0%	2.78
			Heat Pump Water Heating	3.56%	5%	2.598	59%	0.000180	M	5.0%	0.94
		Data / computing / office equip	HE (ES) Computers	13.75%	75%	9.024	25%	0.000189	M	5.0%	1.20
			HE (ES) Other Office Equipment	3.75%	65%	1.804	25%	0.000189	M	5.0%	1.41
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.258	8%	-	O	5.0%	1.97
		Process equip	HE (ES) Icemakers	1.25%	25%	0.601	25%	0.000189	L	0.5%	1.38
			HE (ES) Refrig. Bev. Vending Mach	0.35%	25%	0.481	20%	0.000189	M	5.0%	0.83
			HE (ES) Water Cooler	0.16%	25%	0.120	15%	0.000189	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.50%	20%	0.241	10%	-	M	5.0%	0.00
			HE Commercial Clothes Washers	0.50%	43%	0.241	35%	-	M	5.0%	0.00
			Low Pressure Drop Pool Filter	0.18%	5%	0.832	5%	0.000180	M	5.0%	0.38
		Clotheswashing	HE Clothes Washers	0.00%	20%	0.000	45%	0.000180	M	5.0%	0.64

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	NC	Pool	Solar Pool Heater	0.00%	0%	0.005	40%	0.000165	L	0.5%	1.56
		Lighting equipment	CFL Fixture	0.76%	50%	0.011	69%	0.000180	M	5.0%	4.26
			Electronic ballast	4.30%	90%	0.056	30%	0.000180	M	5.0%	2.36
			HPT8 Fixture to replace T8	8.72%	10%	0.113	11%	0.000180	O	30.0%	0.68
			LED Exterior Lighting	0.30%	1%	0.005	90%	0.000180	O	2.5%	0.62
			LED Task Lighting	0.76%	1%	0.011	35%	0.000180	O	2.5%	0.28
		Refrig - Cooler/Freezer equip	Economizer for Coolers	6.00%	20%	0.104	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	12.00%	16%	0.208	30%	0.000097	M	5.0%	1.93
		Lighting controls / design	Bi-level stairwell lighting	0.86%	20%	0.013	50%	0.000180	M	5.0%	4.77
			Efficient lighting design/layout	14.00%	30%	0.182	20%	0.000180	O	3.4%	3.03
		Cooling Equipment	Desiccant Dehumidification	4.07%	5%	0.070	5%	0.000854	L	0.5%	1.03
			Economizer	4.88%	84%	0.070	20%	0.000854	M	5.0%	5.00
		HVAC RCx / Controls	Energy Management System	10.31%	50%	0.141	10%	0.000854	M	5.0%	3.20
			HVAC System Commissioning	10.31%	5%	0.141	10%	0.000854	H	12.5%	2.86
			Thermal Energy Storage	0.00%	0%	0.000	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.45%	15%	0.039	5%	0.000165	M	5.0%	3.42
			Heat Recovery for Hot Water Use	2.25%	28%	0.039	40%	0.000097	M	5.0%	13.74
		Data / computing / office equip	Energy Efficient Data Centers (virtu	27.60%	50%	0.359	40%	0.000180	H	12.5%	6.34
		Shell improvement	High performance integrated desig	8.14%	15%	0.141	30%	0.000854	H	12.5%	3.59
			Shell: Improved Insulation and Air	10.31%	65%	0.141	8%	0.000802	M	5.0%	5.47
			Shell: Reduced Solar Gain	9.77%	25%	0.141	10%	0.000802	H	12.5%	2.03

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	Pool	Pool Cover	0.36%	5%	0.295	60%	0.000165	M	1.6%	1.21
		Lighting equipment	Advanced Metal Halide	0.07%	15%	0.103	30%	0.000180	O	10.0%	1.33
			CFL Screw in	0.63%	40%	0.620	71%	0.000180	O	4.0%	3.10
			Electronic ballast	4.30%	90%	3.172	30%	0.000180	O	6.3%	0.69
			HE Halogen	0.63%	20%	0.620	30%	0.000180	M	1.6%	7.28
			HO T5 lamps	0.11%	15%	0.103	45%	0.000180	O	6.3%	2.24
			HPT8 Fixture to replace T12	4.74%	20%	3.497	28%	0.000180	O	6.3%	1.00
			Induction	0.36%	5%	0.292	10%	0.000180	O	6.3%	0.81
			LED Exit Lights	0.12%	60%	0.093	75%	0.000180	H	3.8%	1.14
			LED Exterior Lighting	0.30%	1%	0.292	90%	0.000180	M	1.6%	0.48
			LED Traffic lights	0.00%	1%	0.000	90%	0.000180	M	1.6%	0.41
			Upgrade Ellipsoidal Reflector Lamp	0.01%	80%	0.006	30%	0.000180	O	6.0%	1.98
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	7.20%	10%	5.906	4%	0.000097	L	0.5%	0.76
			Ambient Sub-Cooling - oversized c	14.40%	10%	11.812	5%	0.000097	O	1.3%	0.73
			Economizer for Coolers	6.00%	20%	5.906	20%	0.000097	L	0.5%	3.77
			Evaporative Cooling	14.40%	35%	11.812	5%	0.000097	L	0.5%	2.46
			Evaporator Fan Controller	0.29%	10%	0.236	10%	0.000097	L	0.5%	4.21
			HE Compressors	14.40%	12%	11.812	8%	0.000097	O	2.0%	1.21
			Insulated Suction Lines	14.40%	75%	11.812	1%	0.000097	L	0.5%	0.57
			Liquid Pressure Amplifiers	14.40%	95%	11.812	5%	0.000097	L	0.5%	2.53
			Mechanical Subcooling - additional	14.40%	95%	11.812	5%	0.000097	L	0.5%	1.98
			Parallel Rack Systems	5.60%	10%	11.812	5%	0.000097	L	0.5%	2.46
			VSD on Refrigeration Circulating P	0.24%	10%	0.236	30%	0.000097	H	3.8%	0.66
			VSD on Refrigeration Fan	0.29%	25%	0.236	30%	0.000097	H	3.8%	1.26
		Refrig - RCx / controls	Anti-sweat heater controls	5.02%	24%	3.898	6%	0.000097	O	9.5%	2.34
			Case Lights-off timer (12am and 6a	2.64%	25%	3.898	3%	0.000097	M	1.6%	2.97
			Cooler/Freezer Door Auto Closers	4.00%	25%	5.906	4%	0.000097	H	3.8%	2.76
			Cooler/Freezer Door Gaskets	3.20%	25%	5.906	2%	0.000097	H	3.8%	1.95
			Cycle fan off with thermostat; duty c	4.80%	25%	11.812	5%	0.000097	M	1.6%	5.50
			Defrost Control System	14.40%	55%	11.812	3%	0.000097	L	0.5%	1.63
			Floating Head Pressure Control	12.00%	8%	11.812	30%	0.000097	M	1.6%	1.41
			Refrigeration E-Cube	15.20%	5%	11.812	2%	0.000097	H	3.8%	0.99
			Refrigeration System Maintenance	14.40%	8%	11.812	5%	0.000097	O	4.0%	2.46
			Strip Curtains	6.80%	12%	5.906	4%	0.000097	O	6.5%	2.76
		Lighting controls / design	Bi-level stairwell lighting	0.86%	10%	0.721	50%	0.000180	M	1.6%	0.88
			Daylighting controls	1.50%	1%	1.477	20%	0.000180	O	1.0%	0.42
			Exterior light timers	0.40%	95%	0.292	25%	0.000180	O	3.0%	5.74
			Occupancy Sensor	9.11%	26%	9.612	18%	0.000180	O	4.0%	3.34
			Scheduled interior lighting	13.02%	50%	9.612	10%	0.000180	L	0.5%	4.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	0.77%	68%	0.628	15%	0.000854	M	1.6%	1.40
			Desiccant Dehumidification	2.71%	5%	4.005	5%	0.000854	L	0.5%	0.27
			HE Chillers (air and water cooled)	0.77%	60%	0.628	15%	0.000854	H	3.8%	2.46
			HE Motors (VSDs, ECMs, on fans)	4.61%	28%	4.005	2%	0.000854	O	4.0%	3.21
			HE Rooftop AC systems	2.43%	10%	1.993	8%	0.000854	M	1.6%	5.77
			Ultraviolet A/C Coil Cleaning Syster	0.49%	25%	0.399	4%	0.000854	M	1.6%	0.81
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	0.81%	15%	0.628	5%	0.000854	M	1.6%	1.61
			Energy Management System	8.14%	10%	8.010	11%	0.000854	O	2.5%	1.32
			Guest room contls	0.00%	0%	0.554	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	10.85%	20%	8.010	8%	0.000854	O	2.5%	4.16
			HVAC System Retrocommissioning	10.31%	5%	8.010	15%	0.000854	O	2.5%	3.54
			Improve Duct Sealing	4.88%	15%	8.010	1%	0.000854	O	2.5%	5.62
			Insulate Pipes/Lines	10.85%	10%	8.010	1%	0.000854	O	2.5%	0.19
			Programmable Thermostat	3.80%	13%	8.010	4%	0.000854	O	2.5%	2.33
			Time Clock	10.85%	95%	8.010	4%	0.000854	O	2.5%	2.33
			Direct load control AC	0.00%	2%	0.000	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.56%	15%	0.554	60%	0.000180	M	1.6%	0.60
		DHW System improvements	DHW Fuel Switching (elec to gas)	0.99%	20%	2.215	100%	0.000165	L	0.5%	1.12
			Grey Water Heat Exchanger	1.98%	8%	2.215	5%	0.000165	L	0.5%	1.71
			Heat Trap	1.98%	60%	2.215	5%	0.000165	M	1.6%	1.71
			Insulating Blankets	1.50%	65%	2.215	4%	0.000165	M	1.6%	1.57
			Pipe Insulation	0.23%	25%	0.221	1%	0.000165	M	1.6%	1.92
			Reduced Temperature Setpoints	1.98%	65%	2.215	19%	0.000165	O	2.5%	10.51
			Timers	1.98%	60%	2.215	5%	0.000165	O	2.5%	3.65
			Water Heater Cycling	1.98%	60%	2.215	5%	0.000165	O	2.5%	3.65
		Data / computing / office equip	Energy Efficient Data Centers (virtu	27.60%	20%	20.376	45%	0.000180	H	3.8%	2.89
			HE Battery Charging Station	0.03%	10%	0.022	35%	0.000180	M	1.6%	1.82
			Plug Load Sensors	1.20%	70%	0.886	20%	0.000180	L	0.5%	2.31
			Power Management Software	0.03%	35%	0.022	15%	0.000180	M	1.6%	1.93
		Faucets / Nozzles	Faucet Aerators	0.29%	40%	0.221	20%	0.000165	M	1.6%	5.55
			Low Flow Pre-Rinse Nozzles	0.14%	45%	0.221	55%	0.000165	M	1.6%	9.76
			Low Flow Showerhead	0.14%	15%	0.221	1%	0.000165	M	1.6%	2.82
			Ultrasonic Faucet Control	0.27%	5%	0.221	3%	0.000165	M	1.6%	1.18
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	1.034	100%	-	M	1.6%	1.62
		Process equip	TOD Pool Pump Timer	0.40%	5%	0.295	10%	0.000165	M	1.6%	3.53
			Vendor Miser	0.10%	30%	0.074	46%	0.000180	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	9.22%	15%	8.010	12%	0.000802	L	0.5%	1.68
			Shell: Reduced Solar Gain	9.22%	25%	8.010	10%	0.000802	M	1.6%	0.12
		Refrig - Displays	New case doors	1.50%	8%	1.169	10%	0.000097	O	6.5%	1.52
			Night Covers for Display Cases	5.02%	12%	3.898	6%	0.000097	H	3.8%	1.01
			Refrigerated Case Doors - Door Mis	5.02%	8%	3.898	10%	0.000097	H	3.8%	2.76
			Refrigerated Case Doors - Low/No	5.02%	5%	3.898	3%	0.000097	O	6.5%	7.44

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	ROB	Lighting equipment	CFL Screw in	0.63%	40%	0.321	71%	0.000180	M	5.0%	3.10
			HPT8 Fixture to replace T8	8.72%	20%	0.757	11%	0.000180	O	20.0%	0.40
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000180	H	12.5%	3.21
			LED Task Lighting	0.76%	1%	0.073	35%	0.000180	M	5.0%	0.33
		Refrig - Cooler/Freezer equip	ECM Motors on fans	12.00%	51%	0.995	7%	0.000097	O	6.3%	3.13
			Evaporative Cooling	14.40%	10%	1.389	5%	0.000097	L	0.5%	2.46
			HE Compressors	14.40%	12%	0.995	8%	0.000097	O	15.0%	6.00
			PSC Motors on fans	14.40%	31%	0.995	1%	0.000097	M	5.0%	0.59
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.43%	5%	0.043	65%	0.000180	L	0.5%	2.32
			HE Dishwashers	0.59%	20%	0.078	25%	0.000165	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	0.77%	33%	0.038	25%	0.000854	H	12.5%	1.80
			HE Packaged AC (non rooftop)	2.43%	25%	0.201	16%	0.000854	O	10.0%	4.04
			HE Rooftop AC systems	2.43%	10%	0.201	17%	0.000854	O	10.0%	4.25
			PTAC and PTHP	0.68%	15%	0.047	30%	0.000854	O	10.0%	0.87
			Geothermal Heat Pumps	0.05%	5%	0.033	36%	0.000854	O	5.0%	1.55
		Process equip: cooking	Connectionless (Boilerless) Steame	0.19%	25%	0.022	50%	0.000180	L	0.5%	2.86
			HE (ES) Fryers	0.13%	25%	0.022	15%	0.000180	L	0.5%	0.98
			HE (ES) Hot Food Holding Cabinet	0.45%	25%	0.043	60%	0.000180	L	0.5%	3.32
			HE (ES) Steam Cookers / Steamer	0.19%	25%	0.022	50%	0.000180	L	0.5%	2.86
			HE Broilers	0.25%	25%	0.022	18%	0.000180	L	0.5%	1.16
			HE Griddles	0.25%	40%	0.022	32%	0.000180	L	0.5%	1.96
			HE Induction Cooking	0.23%	25%	0.022	0%	-	L	0.5%	0.00
			HE Ovens	0.25%	20%	0.022	2%	0.000180	L	0.5%	0.08
			Solid State Temperature Controls	0.05%	15%	0.004	15%	0.000180	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	3.00%	35%	0.260	5%	0.000165	M	5.0%	2.76
			Heat Pump Water Heating	3.56%	5%	0.469	59%	0.000165	M	5.0%	1.38
		Data / computing / office equip	HE (ES) Computers	0.03%	75%	0.004	25%	0.000180	M	5.0%	1.65
			HE (ES) Other Office Equipment	0.03%	65%	0.003	25%	0.000180	M	5.0%	1.93
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.047	8%	-	O	5.0%	2.68
		Process equip	HE (ES) Icemakers	0.06%	75%	0.005	25%	0.000180	L	0.5%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.04%	25%	0.009	20%	0.000180	M	5.0%	0.83
			HE (ES) Water Cooler	0.02%	25%	0.003	15%	0.000180	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.15%	20%	0.013	10%	0.000180	M	5.0%	0.94
			HE Commercial Clothes Washers	0.15%	43%	0.013	35%	0.000180	M	5.0%	2.76
			Low Pressure Drop Pool Filter	0.36%	5%	0.300	5%	0.000165	M	5.0%	0.57
		Clotheswashing	HE Clothes Washers	0.45%	20%	0.078	45%	0.000165	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Asser	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000165	L	0.5%	1.02
		Lighting equipment	CFL Fixture	1.78%	50%	0.033	69%	0.000180	M	5.0%	3.14
			Electronic ballast	10.13%	90%	0.171	30%	0.000180	M	5.0%	1.60
			HPT8 Fixture to replace T8	20.56%	10%	0.347	11%	0.000180	O	30.0%	0.44
			LED Exterior Lighting	0.59%	1%	0.013	90%	0.000180	O	2.5%	0.40
			LED Task Lighting	1.78%	2%	0.033	35%	0.000180	O	2.5%	0.18
		Refrig - Cooler/Freezer equip	Economizer for Coolers	0.75%	0%	0.017	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	1.50%	16%	0.034	7%	0.000097	M	5.0%	1.66
		Lighting controls / design	Bi-level stairwell lighting	1.98%	30%	0.039	50%	0.000180	M	5.0%	3.51
			Efficient lighting design/layout	33.00%	30%	0.556	20%	0.000180	O	3.4%	2.10
		Cooling Equipment	Desiccant Dehumidification	14.65%	5%	0.329	5%	0.000854	L	0.5%	0.66
			Economizer	7.81%	84%	0.146	20%	0.000854	M	5.0%	3.48
		HVAC RCx / Controls	Energy Management System	27.31%	50%	0.485	10%	0.000854	M	5.0%	2.01
			HVAC System Commissioning	27.31%	5%	0.485	10%	0.000854	H	12.5%	1.83
			Thermal Energy Storage	5.01%	0%	0.113	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.81%	15%	0.091	5%	0.000165	M	5.0%	3.42
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000097	M	5.0%	8.60
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.16%	50%	0.003	40%	0.000180	H	12.5%	4.65
		Shell improvement	High performance integrated desig	21.56%	15%	0.485	30%	0.000854	H	12.5%	2.29
			Shell: Improved Insulation and Air	27.31%	65%	0.485	8%	0.000802	M	5.0%	3.49
			Shell: Reduced Solar Gain	25.88%	25%	0.485	10%	0.000802	H	12.5%	1.30

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Asse	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000165	M	1.6%	0.76
		Lighting equipment	Advanced Metal Halide	0.17%	15%	0.316	30%	0.000180	O	10.0%	0.87
			CFL Screw in	1.49%	40%	1.896	71%	0.000180	O	4.0%	2.13
			Electronic ballast	10.13%	90%	9.700	30%	0.000180	O	6.3%	0.44
			HE Halogen	1.49%	20%	1.896	30%	0.000180	M	1.6%	5.91
			HO T5 lamps	0.25%	30%	0.316	45%	0.000180	O	6.3%	1.51
			HPT8 Fixture to replace T12	11.17%	30%	10.694	28%	0.000180	O	6.3%	1.00
			Induction	0.71%	5%	0.757	10%	0.000180	O	6.3%	0.51
			LED Exit Lights	0.28%	60%	0.284	75%	0.000180	H	3.8%	0.74
			LED Exterior Lighting	0.59%	1%	0.757	90%	0.000180	M	1.6%	0.30
			LED Traffic lights	0.00%	1%	0.000	90%	0.000180	M	1.6%	0.26
			Upgrade Ellipsoidal Reflector Lamp	0.01%	80%	0.019	30%	0.000180	O	6.0%	1.32
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	0.90%	10%	0.958	4%	0.000097	L	0.5%	0.49
			Ambient Sub-Cooling - oversized c	1.80%	10%	1.915	5%	0.000097	O	1.3%	0.47
			Economizer for Coolers	0.75%	0%	0.958	20%	0.000097	L	0.5%	2.66
			Evaporative Cooling	1.80%	35%	1.915	5%	0.000097	L	0.5%	1.66
			Evaporator Fan Controller	0.04%	10%	0.038	10%	0.000097	L	0.5%	2.97
			HE Compressors	1.80%	12%	1.915	8%	0.000097	O	2.0%	0.79
			Insulated Suction Lines	1.80%	75%	1.915	1%	0.000097	L	0.5%	0.36
			Liquid Pressure Amplifiers	1.80%	95%	1.915	5%	0.000097	L	0.5%	1.70
			Mechanical Subcooling - additional	1.80%	95%	1.915	5%	0.000097	L	0.5%	1.32
			Parallel Rack Systems	0.70%	10%	1.915	5%	0.000097	L	0.5%	1.66
			VSD on Refrigeration Circulating P	0.03%	10%	0.038	30%	0.000097	H	3.8%	0.42
			VSD on Refrigeration Fan	0.04%	25%	0.038	30%	0.000097	H	3.8%	0.82
		Refrig - RCx / controls	Anti-sweat heater controls	0.63%	0%	0.632	6%	0.000097	O	9.5%	1.57
			Case Lights-off timer (12am and 6a	0.33%	0%	0.632	3%	0.000097	M	1.6%	1.99
			Cooler/Freezer Door Auto Closers	0.50%	0%	0.958	4%	0.000097	H	3.8%	1.86
			Cooler/Freezer Door Gaskets	0.40%	0%	0.958	2%	0.000097	H	3.8%	1.31
			Cycle fan off with thermostat; duty c	0.60%	0%	1.915	5%	0.000097	M	1.6%	3.96
			Defrost Control System	1.80%	55%	1.915	3%	0.000097	L	0.5%	1.07
			Floating Head Pressure Control	1.50%	8%	1.915	7%	0.000097	M	1.6%	1.20
			Refrigeration E-Cube	1.90%	5%	1.915	2%	0.000097	H	3.8%	0.64
			Refrigeration System Maintenance	1.80%	8%	1.915	5%	0.000097	O	4.0%	1.66
			Strip Curtains	0.85%	0%	0.958	4%	0.000097	O	6.5%	1.86
		Lighting controls / design	Bi-level stairwell lighting	1.98%	40%	2.204	50%	0.000180	M	1.6%	0.57
			Daylighting controls	3.00%	1%	3.831	20%	0.000180	O	1.0%	0.27
			Exterior light timers	0.79%	95%	0.757	25%	0.000180	O	3.0%	4.15
			Occupancy Sensor	21.48%	26%	29.393	18%	0.000180	O	4.0%	3.34
			Scheduled interior lighting	30.69%	25%	29.393	10%	0.000180	L	0.5%	2.77

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Asser	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	1.29%	16%	1.370	15%	0.000854	M	1.6%	0.91
			Desiccant Dehumidification	9.77%	5%	18.705	5%	0.000854	L	0.5%	0.17
			HE Chillers (air and water cooled)	1.29%	60%	1.370	15%	0.000854	H	3.8%	1.64
			HE Motors (VSDs, ECMs, on fans)	16.60%	28%	18.705	2%	0.000854	O	4.0%	2.13
			HE Rooftop AC systems	3.47%	10%	3.697	15%	0.000854	M	1.6%	4.07
			Ultraviolet A/C Coil Cleaning Syster	0.74%	25%	0.785	4%	0.000854	M	1.6%	0.52
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	1.36%	15%	1.370	5%	0.000854	M	1.6%	1.04
			Energy Management System	21.56%	10%	27.537	11%	0.000854	O	2.5%	0.83
			Guest room contls	0.00%	0%	1.101	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	28.75%	50%	27.537	8%	0.000854	O	2.5%	2.64
			HVAC System Retrocommissioning	27.31%	5%	27.537	15%	0.000854	O	2.5%	2.28
			Improve Duct Sealing	12.94%	15%	27.537	1%	0.000854	O	2.5%	3.70
			Insulate Pipes/Lines	28.75%	10%	27.537	1%	0.000854	O	2.5%	0.12
			Programmable Thermostat	10.06%	13%	27.537	4%	0.000854	O	2.5%	1.47
			Time Clock	28.75%	95%	27.537	4%	0.000854	O	2.5%	1.47
			Direct load control AC	5.14%	2%	6.567	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.56%	15%	0.718	60%	0.000180	M	1.6%	0.38
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.78%	20%	5.172	100%	0.000165	L	0.5%	0.78
			Grey Water Heat Exchanger	3.56%	8%	5.172	5%	0.000165	L	0.5%	1.10
			Heat Trap	3.56%	60%	5.172	5%	0.000165	M	1.6%	1.10
			Insulating Blankets	2.70%	65%	5.172	4%	0.000165	M	1.6%	1.00
			Pipe Insulation	0.41%	25%	0.517	1%	0.000165	M	1.6%	1.23
			Reduced Temperature Setpoints	3.56%	50%	5.172	19%	0.000165	O	2.5%	8.90
			Timers	3.56%	60%	5.172	5%	0.000165	O	2.5%	2.47
			Water Heater Cycling	3.56%	60%	5.172	5%	0.000165	O	2.5%	2.47
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.16%	20%	0.153	45%	0.000180	H	3.8%	1.94
			HE Battery Charging Station	0.04%	10%	0.038	35%	0.000180	M	1.6%	1.21
			Plug Load Sensors	1.80%	70%	1.724	20%	0.000180	L	0.5%	1.56
			Power Management Software	0.38%	25%	0.383	15%	0.000180	M	1.6%	1.29
		Faucets / Nozzles	Faucet Aerators	0.51%	40%	0.517	20%	0.000165	M	1.6%	4.74
			Low Flow Pre-Rinse Nozzles	0.24%	45%	0.517	55%	0.000165	M	1.6%	7.76
			Low Flow Showerhead	0.24%	15%	0.517	1%	0.000165	M	1.6%	1.87
			Ultrasonic Faucet Control	0.49%	15%	0.517	3%	0.000165	M	1.6%	0.74
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	1.342	100%	-	M	1.6%	1.53
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000165	M	1.6%	2.36
			Vendor Miser	0.10%	30%	0.096	46%	0.000180	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	24.44%	15%	27.537	12%	0.000802	L	0.5%	1.06
			Shell: Reduced Solar Gain	24.44%	25%	27.537	10%	0.000802	M	1.6%	0.07
		Refrig - Displays	New case doors	0.19%	0%	0.190	10%	0.000097	O	6.5%	1.00
			Night Covers for Display Cases	0.63%	0%	0.632	6%	0.000097	H	3.8%	0.65
			Refrigerated Case Doors - Door Mis	0.63%	0%	0.632	10%	0.000097	H	3.8%	1.86
			Refrigerated Case Doors - Low/No	0.63%	0%	0.632	3%	0.000097	O	6.5%	5.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Asse	ROB	Lighting equipment	CFL Screw in	1.49%	40%	0.982	71%	0.000180	M	5.0%	2.13
			HPT8 Fixture to replace T8	20.56%	5%	2.316	11%	0.000180	O	20.0%	0.25
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000180	H	12.5%	2.22
			LED Task Lighting	1.78%	2%	0.223	35%	0.000180	M	5.0%	0.21
		Refrig - Cooler/Freezer equip	ECM Motors on fans	1.50%	0%	0.161	7%	0.000097	O	6.3%	2.16
			Evaporative Cooling	1.80%	10%	0.225	5%	0.000097	L	0.5%	1.66
			HE Compressors	1.80%	12%	0.161	8%	0.000097	O	15.0%	4.56
			PSC Motors on fans	1.80%	0%	0.161	1%	0.000097	M	5.0%	0.38
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.43%	5%	0.056	65%	0.000180	L	0.5%	1.54
			HE Dishwashers	0.00%	20%	0.000	25%	0.000165	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	1.29%	33%	0.084	25%	0.000854	H	12.5%	1.18
			HE Packaged AC (non rooftop)	3.70%	25%	0.397	16%	0.000854	O	10.0%	2.75
			HE Rooftop AC systems	3.70%	10%	0.397	25%	0.000854	O	10.0%	2.90
			PTAC and PTHP	1.04%	15%	0.093	30%	0.000854	O	10.0%	0.55
			Geothermal Heat Pumps	0.08%	5%	0.065	36%	0.000854	O	5.0%	1.43
		Process equip: cooking	Connectionless (Boilerless) Steame	0.19%	25%	0.028	50%	0.000180	L	0.5%	1.92
			HE (ES) Fryers	0.13%	25%	0.028	15%	0.000180	L	0.5%	0.63
			HE (ES) Hot Food Holding Cabinet	0.45%	25%	0.056	60%	0.000180	L	0.5%	2.25
			HE (ES) Steam Cookers / Steamer	0.19%	25%	0.028	50%	0.000180	L	0.5%	1.92
			HE Broilers	0.25%	40%	0.028	18%	0.000180	L	0.5%	0.75
			HE Griddles	0.25%	40%	0.028	32%	0.000180	L	0.5%	1.28
			HE Induction Cooking	0.23%	25%	0.028	20%	0.000180	L	0.5%	0.83
			HE Ovens	0.25%	33%	0.028	2%	0.000180	L	0.5%	0.05
			Solid State Temperature Controls	0.05%	15%	0.006	15%	0.000180	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	5.40%	35%	0.608	5%	0.000165	M	5.0%	2.76
			Heat Pump Water Heating	3.56%	5%	0.608	59%	0.000165	M	5.0%	0.88
		Data / computing / office equip	HE (ES) Computers	0.40%	75%	0.061	25%	0.000180	M	5.0%	1.09
			HE (ES) Other Office Equipment	0.40%	65%	0.045	25%	0.000180	M	5.0%	1.29
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.060	8%	-	O	5.0%	1.87
		Process equip	HE (ES) Icemakers	0.80%	25%	0.090	25%	0.000180	L	0.5%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.09%	25%	0.011	20%	0.000180	M	5.0%	0.83
			HE (ES) Water Cooler	0.03%	25%	0.005	15%	0.000180	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.20%	20%	0.023	10%	0.000180	M	5.0%	0.61
			HE Commercial Clothes Washers	0.20%	43%	0.023	35%	0.000180	M	5.0%	1.89
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000165	M	5.0%	0.36
		Clotheswashing	HE Clothes Washers	0.00%	20%	0.000	45%	0.000165	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Order	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000165	L	0.5%	1.02
		Lighting equipment	CFL Fixture	0.43%	50%	0.003	69%	0.000180	H	12.5%	3.28
			Electronic ballast	2.46%	90%	0.014	30%	0.000180	H	12.5%	1.69
			HPT8 Fixture to replace T8	4.98%	10%	0.028	11%	0.000180	O	30.0%	0.41
			LED Exterior Lighting	0.38%	1%	0.003	90%	0.000180	O	2.5%	0.42
			LED Task Lighting	0.45%	2%	0.003	35%	0.000180	O	2.5%	0.19
		Refrig - Cooler/Freezer equip	Economizer for Coolers	0.00%	0%	0.000	20%	0.000097	M	5.0%	2.66
		Refrig - RCx / controls	Floating Head Pressure Control	0.00%	16%	0.000	7%	0.000097	M	5.0%	2.22
		Lighting controls / design	Bi-level stairwell lighting	0.48%	30%	0.003	50%	0.000180	M	5.0%	3.67
			Efficient lighting design/layout	8.00%	30%	0.045	20%	0.000180	O	3.4%	2.20
		Cooling Equipment	Desiccant Dehumidification	1.63%	5%	0.012	5%	0.000854	M	5.0%	0.70
			Economizer	1.95%	84%	0.012	20%	0.000854	H	12.5%	3.66
		HVAC RCx / Controls	Energy Management System	20.62%	50%	0.122	10%	0.000854	H	12.5%	5.60
			HVAC System Commissioning	20.62%	5%	0.122	10%	0.000854	H	12.5%	1.87
			Thermal Energy Storage	0.00%	0%	0.000	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.00%	15%	0.000	5%	0.000165	M	5.0%	3.42
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000097	M	5.0%	7.82
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.40%	50%	0.002	40%	0.000180	H	12.5%	7.22
		Shell improvement	High performance integrated desig	16.28%	15%	0.122	30%	0.000854	H	12.5%	2.32
			Shell: Improved Insulation and Air	20.62%	65%	0.122	8%	0.000802	H	12.5%	3.49
			Shell: Reduced Solar Gain	19.53%	25%	0.122	10%	0.000802	H	12.5%	1.30

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Public Order	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000165	M	1.6%	0.76
		Lighting equipment	Advanced Metal Halide	0.04%	15%	0.026	30%	0.000180	O	10.0%	0.92
			CFL Screw in	0.36%	40%	0.153	71%	0.000180	O	4.0%	2.24
			Electronic ballast	2.46%	90%	0.784	30%	0.000180	O	6.3%	0.47
			HE Halogen	0.36%	20%	0.153	30%	0.000180	H	3.8%	6.10
			HO T5 lamps	0.06%	30%	0.026	45%	0.000180	O	6.3%	1.59
			HPT8 Fixture to replace T12	2.71%	30%	0.864	28%	0.000180	O	6.3%	1.00
			Induction	0.45%	5%	0.160	10%	0.000180	O	6.3%	0.55
			LED Exit Lights	0.07%	60%	0.023	75%	0.000180	H	3.8%	0.78
			LED Exterior Lighting	0.38%	1%	0.160	90%	0.000180	M	1.6%	0.32
			LED Traffic lights	1.00%	5%	0.319	90%	0.000180	H	3.8%	0.28
			Upgrade Ellipsoidal Reflector Lamp	0.00%	80%	0.002	30%	0.000180	O	6.0%	1.40
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	0.00%	10%	0.000	4%	0.000097	L	0.5%	0.49
			Ambient Sub-Cooling - oversized c	0.00%	10%	0.000	5%	0.000097	O	1.3%	0.47
			Economizer for Coolers	0.00%	0%	0.000	20%	0.000097	L	0.5%	2.66
			Evaporative Cooling	0.00%	35%	0.000	5%	0.000097	L	0.5%	1.66
			Evaporator Fan Controller	0.00%	10%	0.000	10%	0.000097	L	0.5%	2.97
			HE Compressors	0.00%	12%	0.000	8%	0.000097	O	2.0%	4.57
			Insulated Suction Lines	0.00%	75%	0.000	1%	0.000097	L	0.5%	0.36
			Liquid Pressure Amplifiers	0.00%	95%	0.000	5%	0.000097	L	0.5%	1.70
			Mechanical Subcooling - additional	0.00%	95%	0.000	5%	0.000097	L	0.5%	1.32
			Parallel Rack Systems	0.00%	10%	0.000	5%	0.000097	L	0.5%	1.66
			VSD on Refrigeration Circulating P	0.00%	10%	0.000	30%	0.000097	H	3.8%	0.42
			VSD on Refrigeration Fan	0.00%	25%	0.000	30%	0.000097	H	3.8%	0.82
		Refrig - RCx / controls	Anti-sweat heater controls	0.00%	0%	0.000	6%	0.000097	O	9.5%	1.57
			Case Lights-off timer (12am and 6a	0.00%	0%	0.000	3%	0.000097	M	1.6%	0.44
			Cooler/Freezer Door Auto Closers	0.00%	0%	0.000	4%	0.000097	H	3.8%	1.86
			Cooler/Freezer Door Gaskets	0.00%	0%	0.000	2%	0.000097	H	3.8%	1.31
			Cycle fan off with thermostat; duty c	0.00%	0%	0.000	5%	0.000097	M	1.6%	3.96
			Defrost Control System	0.00%	55%	0.000	3%	0.000097	L	0.5%	1.07
			Floating Head Pressure Control	0.00%	8%	0.000	7%	0.000097	M	1.6%	1.20
			Refrigeration E-Cube	0.00%	5%	0.000	2%	0.000097	H	3.8%	0.64
			Refrigeration System Maintenance	0.00%	8%	0.000	5%	0.000097	O	4.0%	1.66
			Strip Curtains	0.00%	0%	0.000	4%	0.000097	O	6.5%	1.86
		Lighting controls / design	Bi-level stairwell lighting	0.48%	40%	0.178	50%	0.000180	M	1.6%	0.60
			Daylighting controls	3.00%	1%	1.277	20%	0.000180	O	1.0%	0.25
			Exterior light timers	0.50%	95%	0.160	5%	0.000180	O	3.0%	2.11
			Occupancy Sensor	5.21%	26%	2.375	18%	0.000180	O	4.0%	3.34
			Scheduled interior lighting	7.44%	25%	2.375	5%	0.000180	L	0.5%	2.70

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Order	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	4.83%	16%	1.714	15%	0.000854	H	3.8%	0.96
			Desiccant Dehumidification	1.09%	5%	0.693	5%	0.000854	M	1.6%	0.18
			HE Chillers (air and water cooled)	4.83%	60%	1.714	15%	0.000854	H	3.8%	1.73
			HE Motors (VSDs, ECMs, on fans)	1.84%	28%	0.693	2%	0.000854	O	4.0%	4.11
			HE Rooftop AC systems	3.16%	10%	1.121	15%	0.000854	H	3.8%	4.07
			Ultraviolet A/C Coil Cleaning Syster	0.15%	25%	0.054	4%	0.000854	H	3.8%	0.55
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	5.10%	15%	1.714	5%	0.000854	H	3.8%	1.10
			Energy Management System	16.28%	10%	6.928	11%	0.000854	O	2.5%	0.85
			Guest room contls	0.00%	0%	0.070	0%	-	H	3.8%	0.00
			HVAC System maintenance (servic	21.70%	20%	6.928	8%	0.000854	O	2.5%	2.68
			HVAC System Retrocommissioning	20.62%	5%	6.928	15%	0.000854	O	2.5%	2.34
			Improve Duct Sealing	9.77%	15%	6.928	1%	0.000854	O	2.5%	3.80
			Insulate Pipes/Lines	21.70%	10%	6.928	1%	0.000854	O	2.5%	0.61
			Programmable Thermostat	7.60%	13%	6.928	4%	0.000854	O	2.5%	1.49
			Time Clock	21.70%	95%	6.928	4%	0.000854	O	2.5%	1.49
			Direct load control AC	0.00%	2%	0.000	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.11%	15%	0.048	60%	0.000180	M	1.6%	0.38
		DHW System improvements	DHW Fuel Switching (elec to gas)	0.00%	20%	0.000	100%	0.000165	L	0.5%	0.78
			Grey Water Heat Exchanger	0.00%	8%	0.000	5%	0.000165	L	0.5%	1.10
			Heat Trap	0.00%	60%	0.000	5%	0.000165	M	1.6%	1.10
			Insulating Blankets	0.00%	65%	0.000	4%	0.000165	M	1.6%	1.00
			Pipe Insulation	0.00%	25%	0.000	1%	0.000165	M	1.6%	1.23
			Reduced Temperature Setpoints	0.00%	50%	0.000	19%	0.000165	O	2.5%	8.90
			Timers	0.00%	60%	0.000	5%	0.000165	O	2.5%	2.47
			Water Heater Cycling	0.00%	60%	0.000	5%	0.000165	O	2.5%	2.47
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.40%	20%	0.128	45%	0.000180	H	3.8%	3.46
			HE Battery Charging Station	0.10%	10%	0.032	35%	0.000180	M	1.6%	0.37
			Plug Load Sensors	4.50%	70%	1.437	20%	0.000180	M	1.6%	2.76
			Power Management Software	0.95%	35%	0.319	15%	0.000180	M	1.6%	2.32
		Faucets / Nozzles	Faucet Aerators	0.00%	40%	0.000	20%	0.000165	M	1.6%	4.74
			Low Flow Pre-Rinse Nozzles	0.00%	45%	0.000	55%	0.000165	M	1.6%	7.75
			Low Flow Showerhead	0.00%	15%	0.000	1%	0.000165	M	1.6%	1.86
			Ultrasonic Faucet Control	0.00%	15%	0.000	3%	0.000165	M	1.6%	0.74
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	0.447	100%	-	M	1.6%	1.53
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000165	M	1.6%	2.36
			Vendor Miser	0.02%	30%	0.006	46%	0.000180	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	18.45%	15%	6.928	12%	0.000802	M	1.6%	3.14
			Shell: Reduced Solar Gain	18.45%	25%	6.928	10%	0.000802	H	3.8%	0.07
		Refrig - Displays	New case doors	0.00%	0%	0.000	10%	0.000097	O	6.5%	1.00
			Night Covers for Display Cases	0.00%	0%	0.000	6%	0.000097	H	3.8%	0.65
			Refrigerated Case Doors - Door Mis	0.00%	0%	0.000	10%	0.000097	H	3.8%	1.86
			Refrigerated Case Doors - Low/No	0.00%	0%	0.000	3%	0.000097	O	6.5%	5.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Public Order	ROB	Lighting equipment	CFL Screw in	0.36%	40%	0.079	71%	0.000180	H	12.5%	2.24
			HPT8 Fixture to replace T8	4.98%	15%	0.187	11%	0.000180	O	20.0%	0.24
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000180	H	12.5%	2.33
			LED Task Lighting	0.45%	2%	0.019	35%	0.000180	M	5.0%	0.23
		Refrig - Cooler/Freezer equip	ECM Motors on fans	0.00%	0%	0.000	7%	0.000097	O	6.3%	2.16
			Evaporative Cooling	0.00%	10%	0.000	5%	0.000097	L	0.5%	1.66
			HE Compressors	0.00%	12%	0.000	8%	0.000097	O	15.0%	4.57
			PSC Motors on fans	0.00%	0%	0.000	1%	0.000097	M	5.0%	0.38
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.09%	5%	0.004	65%	0.000180	L	0.5%	3.03
			HE Dishwashers	0.00%	20%	0.000	25%	0.000165	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	4.83%	33%	0.105	25%	0.000854	H	12.5%	1.25
			HE Packaged AC (non rooftop)	0.79%	25%	0.028	16%	0.000854	O	10.0%	2.90
			HE Rooftop AC systems	0.79%	10%	0.028	25%	0.000854	O	10.0%	2.90
			PTAC and PTHP	0.20%	15%	0.006	30%	0.000854	O	10.0%	0.55
			Geothermal Heat Pumps	0.02%	5%	0.005	36%	0.000854	O	5.0%	1.44
		Process equip: cooking	Connectionless (Boilerless) Steame	0.04%	25%	0.002	50%	0.000180	L	0.5%	1.92
			HE (ES) Fryers	0.03%	25%	0.002	15%	0.000180	L	0.5%	0.63
			HE (ES) Hot Food Holding Cabinet	0.09%	25%	0.004	60%	0.000180	L	0.5%	2.25
			HE (ES) Steam Cookers / Steamer	0.04%	25%	0.002	50%	0.000180	L	0.5%	1.92
			HE Broilers	0.05%	40%	0.002	18%	0.000180	L	0.5%	0.75
			HE Griddles	0.05%	40%	0.002	32%	0.000180	L	0.5%	1.28
			HE Induction Cooking	0.05%	25%	0.002	20%	0.000180	L	0.5%	0.83
			HE Ovens	0.05%	33%	0.002	2%	0.000180	L	0.5%	1.56
			Solid State Temperature Controls	0.01%	15%	0.000	15%	0.000180	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	0.00%	35%	0.000	5%	0.000165	M	5.0%	2.76
			Heat Pump Water Heating	0.00%	5%	0.000	59%	0.000165	M	5.0%	0.88
		Data / computing / office equip	HE (ES) Computers	1.00%	75%	0.051	25%	0.000180	M	5.0%	1.09
			HE (ES) Other Office Equipment	1.00%	65%	0.038	25%	0.000180	M	5.0%	1.29
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.020	8%	-	O	5.0%	1.87
		Process equip	HE (ES) Icemakers	2.00%	25%	0.075	25%	0.000180	M	5.0%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.02%	25%	0.001	20%	0.000180	M	5.0%	0.83
			HE (ES) Water Cooler	0.07%	25%	0.004	15%	0.000180	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.50%	20%	0.019	10%	0.000180	M	5.0%	1.89
			HE Commercial Clothes Washers	0.50%	43%	0.019	35%	0.000180	M	5.0%	1.89
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000165	M	5.0%	0.36
		Clotheswashing	HE Clothes Washers	0.00%	20%	0.000	45%	0.000165	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Religious W	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000165	L	0.5%	1.02
		Lighting equipment	CFL Fixture	2.00%	50%	0.020	69%	0.000180	M	5.0%	3.28
			Electronic ballast	11.36%	90%	0.104	30%	0.000180	M	5.0%	1.69
			HPT8 Fixture to replace T8	23.05%	10%	0.210	11%	0.000180	O	30.0%	0.39
			LED Exterior Lighting	0.59%	1%	0.007	90%	0.000180	O	2.5%	0.42
			LED Task Lighting	2.00%	1%	0.020	35%	0.000180	O	2.5%	0.19
		Refrig - Cooler/Freezer equip	Economizer for Coolers	0.75%	0%	0.009	20%	0.000097	M	5.0%	2.66
		Refrig - RCx / controls	Floating Head Pressure Control	1.50%	16%	0.018	7%	0.000097	M	5.0%	2.22
		Lighting controls / design	Bi-level stairwell lighting	2.04%	10%	0.024	50%	0.000180	M	5.0%	3.67
			Efficient lighting design/layout	37.00%	30%	0.338	20%	0.000180	O	3.4%	2.20
		Cooling Equipment	Desiccant Dehumidification	14.65%	5%	0.178	5%	0.000854	L	0.5%	0.70
			Economizer	7.81%	84%	0.079	20%	0.000854	M	5.0%	3.66
		HVAC RCx / Controls	Energy Management System	27.31%	50%	0.263	10%	0.000854	M	5.0%	5.60
			HVAC System Commissioning	27.31%	5%	0.263	10%	0.000854	H	12.5%	1.87
			Thermal Energy Storage	5.01%	0%	0.061	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.81%	15%	0.049	5%	0.000165	M	5.0%	3.42
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000097	M	5.0%	7.82
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.16%	50%	0.001	40%	0.000180	H	12.5%	7.60
		Shell improvement	High performance integrated desig	21.56%	15%	0.263	30%	0.000854	H	12.5%	2.32
			Shell: Improved Insulation and Air	27.31%	65%	0.263	8%	0.000802	M	5.0%	3.49
			Shell: Reduced Solar Gain	25.88%	25%	0.263	10%	0.000802	H	12.5%	1.30

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Religious W	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000165	M	1.6%	0.76
		Lighting equipment	Advanced Metal Halide	0.19%	15%	0.192	30%	0.000180	O	10.0%	0.92
			CFL Screw in	1.67%	40%	1.152	71%	0.000180	O	4.0%	2.24
			Electronic ballast	11.36%	90%	5.891	30%	0.000180	O	6.3%	0.47
			HE Halogen	1.67%	20%	1.152	30%	0.000180	M	1.6%	6.10
			HO T5 lamps	0.28%	5%	0.192	45%	0.000180	O	6.3%	1.59
			HPT8 Fixture to replace T12	12.52%	2%	6.495	28%	0.000180	O	6.3%	1.00
			Induction	0.71%	5%	0.410	10%	0.000180	O	6.3%	0.55
			LED Exit Lights	0.32%	60%	0.173	75%	0.000180	H	3.8%	0.78
			LED Exterior Lighting	0.59%	1%	0.410	90%	0.000180	M	1.6%	0.32
			LED Traffic lights	0.00%	1%	0.000	90%	0.000180	M	1.6%	0.28
			Upgrade Ellipsoidal Reflector Lamp	0.02%	90%	0.012	30%	0.000180	O	6.0%	1.40
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	0.90%	10%	0.519	4%	0.000097	L	0.5%	0.49
			Ambient Sub-Cooling - oversized c	1.80%	10%	1.038	5%	0.000097	O	1.3%	0.47
			Economizer for Coolers	0.75%	0%	0.519	20%	0.000097	L	0.5%	2.66
			Evaporative Cooling	1.80%	35%	1.038	5%	0.000097	L	0.5%	1.66
			Evaporator Fan Controller	0.04%	10%	0.021	10%	0.000097	L	0.5%	2.97
			HE Compressors	1.80%	12%	1.038	8%	0.000097	O	2.0%	4.57
			Insulated Suction Lines	1.80%	75%	1.038	1%	0.000097	L	0.5%	0.36
			Liquid Pressure Amplifiers	1.80%	95%	1.038	5%	0.000097	L	0.5%	1.70
			Mechanical Subcooling - additional	1.80%	95%	1.038	5%	0.000097	L	0.5%	1.32
			Parallel Rack Systems	0.70%	10%	1.038	5%	0.000097	L	0.5%	1.66
			VSD on Refrigeration Circulating P	0.03%	10%	0.021	30%	0.000097	H	3.8%	0.42
			VSD on Refrigeration Fan	0.04%	25%	0.021	30%	0.000097	H	3.8%	0.82
		Refrig - RCx / controls	Anti-sweat heater controls	0.63%	0%	0.342	6%	0.000097	O	9.5%	1.57
			Case Lights-off timer (12am and 6a	0.33%	0%	0.342	3%	0.000097	M	1.6%	0.44
			Cooler/Freezer Door Auto Closers	0.50%	0%	0.519	4%	0.000097	H	3.8%	1.86
			Cooler/Freezer Door Gaskets	0.40%	0%	0.519	2%	0.000097	H	3.8%	1.31
			Cycle fan off with thermostat; duty c	0.60%	0%	1.038	5%	0.000097	M	1.6%	3.96
			Defrost Control System	1.80%	55%	1.038	3%	0.000097	L	0.5%	1.07
			Floating Head Pressure Control	1.50%	8%	1.038	7%	0.000097	M	1.6%	1.20
			Refrigeration E-Cube	1.90%	5%	1.038	2%	0.000097	H	3.8%	0.64
			Refrigeration System Maintenance	1.80%	8%	1.038	5%	0.000097	O	4.0%	1.66
			Strip Curtains	0.85%	0%	0.519	4%	0.000097	O	6.5%	1.86
		Lighting controls / design	Bi-level stairwell lighting	2.04%	5%	1.339	50%	0.000180	M	1.6%	0.60
			Daylighting controls	3.00%	1%	2.075	20%	0.000180	O	1.0%	0.24
			Exterior light timers	0.79%	50%	0.410	25%	0.000180	O	3.0%	4.34
			Occupancy Sensor	24.09%	26%	17.851	18%	0.000180	O	4.0%	3.34
			Scheduled interior lighting	32.69%	0%	17.851	10%	0.000180	L	0.5%	2.63

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Religious W	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	1.29%	16%	0.742	15%	0.000854	M	1.6%	0.96
			Desiccant Dehumidification	9.77%	5%	10.132	5%	0.000854	L	0.5%	0.18
			HE Chillers (air and water cooled)	1.29%	60%	0.742	15%	0.000854	H	3.8%	1.73
			HE Motors (VSDs, ECMs, on fans)	16.60%	28%	10.132	2%	0.000854	O	4.0%	5.97
			HE Rooftop AC systems	3.47%	10%	2.002	15%	0.000854	M	1.6%	4.07
			Ultraviolet A/C Coil Cleaning Syster	0.74%	25%	0.425	4%	0.000854	M	1.6%	0.55
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	1.36%	15%	0.742	5%	0.000854	M	1.6%	1.10
			Energy Management System	21.56%	10%	14.916	11%	0.000854	O	2.5%	0.85
			Guest room contls	0.00%	0%	0.597	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	28.75%	20%	14.916	8%	0.000854	O	2.5%	2.68
			HVAC System Retrocommissioning	27.31%	5%	14.916	15%	0.000854	O	2.5%	2.34
			Improve Duct Sealing	12.94%	15%	14.916	1%	0.000854	O	2.5%	3.80
			Insulate Pipes/Lines	28.75%	10%	14.916	1%	0.000854	O	2.5%	0.61
			Programmable Thermostat	10.06%	13%	14.916	4%	0.000854	O	2.5%	1.49
			Time Clock	28.75%	95%	14.916	4%	0.000854	O	2.5%	1.49
			Direct load control AC	5.14%	2%	3.557	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.06%	15%	0.039	60%	0.000180	M	1.6%	0.38
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.78%	20%	2.801	100%	0.000165	L	0.5%	0.78
			Grey Water Heat Exchanger	3.56%	8%	2.801	5%	0.000165	L	0.5%	1.10
			Heat Trap	3.56%	60%	2.801	5%	0.000165	M	1.6%	1.10
			Insulating Blankets	2.70%	65%	2.801	4%	0.000165	M	1.6%	1.00
			Pipe Insulation	0.41%	25%	0.280	1%	0.000165	M	1.6%	1.23
			Reduced Temperature Setpoints	3.56%	50%	2.801	19%	0.000165	O	2.5%	8.90
			Timers	3.56%	60%	2.801	5%	0.000165	O	2.5%	2.47
			Water Heater Cycling	3.56%	60%	2.801	5%	0.000165	O	2.5%	2.47
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.16%	20%	0.083	45%	0.000180	H	3.8%	3.73
			HE Battery Charging Station	0.04%	10%	0.021	35%	0.000180	M	1.6%	0.37
			Plug Load Sensors	1.80%	70%	0.934	20%	0.000180	L	0.5%	2.96
			Power Management Software	0.38%	25%	0.208	15%	0.000180	M	1.6%	2.50
		Faucets / Nozzles	Faucet Aerators	0.51%	40%	0.280	20%	0.000165	M	1.6%	4.74
			Low Flow Pre-Rinse Nozzles	0.24%	45%	0.280	55%	0.000165	M	1.6%	7.75
			Low Flow Showerhead	0.24%	15%	0.280	1%	0.000165	M	1.6%	1.86
			Ultrasonic Faucet Control	0.49%	15%	0.280	3%	0.000165	M	1.6%	0.74
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	0.727	100%	-	M	1.6%	1.53
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000165	M	1.6%	2.36
			Vendor Miser	0.01%	30%	0.005	46%	0.000180	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	24.44%	15%	14.916	12%	0.000802	L	0.5%	3.14
			Shell: Reduced Solar Gain	24.44%	25%	14.916	10%	0.000802	M	1.6%	0.07
		Refrig - Displays	New case doors	0.19%	0%	0.103	10%	0.000097	O	6.5%	1.00
			Night Covers for Display Cases	0.63%	0%	0.342	6%	0.000097	H	3.8%	0.65
			Refrigerated Case Doors - Door Mis	0.63%	0%	0.342	10%	0.000097	H	3.8%	1.86
			Refrigerated Case Doors - Low/No	0.63%	0%	0.342	3%	0.000097	O	6.5%	5.85

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Religious W	ROB	Lighting equipment	CFL Screw in	1.67%	40%	0.596	71%	0.000180	M	5.0%	2.24
			HPT8 Fixture to replace T8	23.05%	2%	1.407	11%	0.000180	O	20.0%	0.22
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000180	H	12.5%	2.33
			LED Task Lighting	2.00%	1%	0.135	35%	0.000180	M	5.0%	0.23
		Refrig - Cooler/Freezer equip	ECM Motors on fans	1.50%	0%	0.087	7%	0.000097	O	6.3%	2.16
			Evaporative Cooling	1.80%	10%	0.122	5%	0.000097	L	0.5%	1.66
			HE Compressors	1.80%	12%	0.087	8%	0.000097	O	15.0%	4.57
			PSC Motors on fans	1.80%	0%	0.087	1%	0.000097	M	5.0%	0.38
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.04%	5%	0.003	65%	0.000180	L	0.5%	2.80
			HE Dishwashers	1.05%	20%	0.099	25%	0.000165	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	1.29%	33%	0.045	25%	0.000854	H	12.5%	1.25
			HE Packaged AC (non rooftop)	3.70%	25%	0.215	16%	0.000854	O	10.0%	2.90
			HE Rooftop AC systems	3.70%	10%	0.215	25%	0.000854	O	10.0%	2.90
			PTAC and PTHP	1.04%	15%	0.050	30%	0.000854	O	10.0%	0.55
			Geothermal Heat Pumps	0.08%	5%	0.035	36%	0.000854	O	5.0%	1.44
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.002	50%	0.000180	L	0.5%	1.92
			HE (ES) Fryers	0.01%	25%	0.002	15%	0.000180	L	0.5%	0.63
			HE (ES) Hot Food Holding Cabinet	0.05%	25%	0.003	60%	0.000180	L	0.5%	2.25
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.002	50%	0.000180	L	0.5%	1.92
			HE Broilers	0.03%	40%	0.002	18%	0.000180	L	0.5%	0.75
			HE Griddles	0.03%	40%	0.002	32%	0.000180	L	0.5%	1.28
			HE Induction Cooking	0.02%	25%	0.002	0%	-	L	0.5%	0.00
			HE Ovens	0.03%	33%	0.002	2%	0.000180	L	0.5%	1.56
			Solid State Temperature Controls	0.01%	15%	0.000	15%	0.000180	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	5.40%	35%	0.329	5%	0.000165	M	5.0%	2.76
			Heat Pump Water Heating	3.56%	5%	0.329	59%	0.000165	M	5.0%	0.88
		Data / computing / office equip	HE (ES) Computers	0.40%	75%	0.033	25%	0.000180	M	5.0%	1.09
			HE (ES) Other Office Equipment	0.40%	65%	0.024	25%	0.000180	M	5.0%	1.29
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.033	8%	-	O	5.0%	1.87
		Process equip	HE (ES) Icemakers	0.80%	25%	0.049	25%	0.000180	L	0.5%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.00%	25%	0.001	20%	0.000180	M	5.0%	0.83
			HE (ES) Water Cooler	0.03%	25%	0.002	15%	0.000180	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.20%	20%	0.012	10%	0.000180	M	5.0%	1.89
			HE Commercial Clothes Washers	0.20%	43%	0.012	35%	0.000180	M	5.0%	1.89
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000165	M	5.0%	0.36
		Clotheswashing	HE Clothes Washers	0.81%	20%	0.099	45%	0.000165	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service	NC	Pool	Solar Pool Heater	0.00%	0%	0.000	40%	0.000165	L	0.5%	1.56
		Lighting equipment	CFL Fixture	1.48%	50%	0.033	69%	0.000180	M	5.0%	4.26
			Electronic ballast	16.60%	90%	0.338	30%	0.000180	M	5.0%	2.36
			HPT8 Fixture to replace T8	19.48%	10%	0.397	11%	0.000180	O	30.0%	0.68
			LED Exterior Lighting	1.04%	1%	0.028	90%	0.000180	O	2.5%	0.62
			LED Task Lighting	1.48%	1%	0.033	35%	0.000180	O	2.5%	0.28
		Refrig - Cooler/Freezer equip	Economizer for Coolers	3.00%	20%	0.081	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	6.00%	16%	0.163	7%	0.000097	M	5.0%	2.46
		Lighting controls / design	Bi-level stairwell lighting	0.49%	20%	0.011	50%	0.000180	M	5.0%	4.77
			Efficient lighting design/layout	41.00%	30%	0.835	20%	0.000180	O	3.4%	3.03
		Cooling Equipment	Desiccant Dehumidification	9.77%	5%	0.265	5%	0.000854	L	0.5%	1.03
			Economizer	1.95%	84%	0.044	20%	0.000854	M	5.0%	5.00
		HVAC RCx / Controls	Energy Management System	25.77%	50%	0.552	10%	0.000854	M	5.0%	3.20
			HVAC System Commissioning	25.77%	5%	0.552	10%	0.000854	H	12.5%	2.86
			Thermal Energy Storage	1.46%	0%	0.040	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.68%	15%	0.092	5%	0.000165	M	5.0%	3.42
			Heat Recovery for Hot Water Use	0.00%	28%	0.000	40%	0.000097	M	5.0%	13.74
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.40%	50%	0.008	40%	0.000180	H	12.5%	6.34
		Shell improvement	High performance integrated desig	20.34%	15%	0.552	30%	0.000854	H	12.5%	3.59
			Shell: Improved Insulation and Air	25.77%	65%	0.552	8%	0.000802	M	5.0%	5.47
			Shell: Reduced Solar Gain	24.41%	25%	0.552	10%	0.000802	H	12.5%	2.03

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service	Retrofit	Pool	Pool Cover	0.00%	5%	0.000	60%	0.000165	M	1.6%	1.21
		Lighting equipment	Advanced Metal Halide	1.64%	15%	3.796	30%	0.000180	O	10.0%	1.33
			CFL Screw in	1.23%	40%	1.898	71%	0.000180	O	4.0%	3.10
			Electronic ballast	16.60%	90%	19.207	30%	0.000180	O	6.3%	0.69
			HE Halogen	1.23%	20%	1.898	30%	0.000180	M	1.6%	7.28
			HO T5 lamps	2.46%	50%	3.796	45%	0.000180	O	6.3%	2.24
			HPT8 Fixture to replace T12	18.30%	40%	21.176	28%	0.000180	O	6.3%	1.00
			Induction	1.24%	5%	1.600	10%	0.000180	O	6.3%	0.81
			LED Exit Lights	0.23%	60%	0.285	75%	0.000180	H	3.8%	1.14
			LED Exterior Lighting	1.04%	1%	1.600	90%	0.000180	M	1.6%	0.48
			LED Traffic lights	0.00%	1%	0.000	90%	0.000180	M	1.6%	0.41
			Upgrade Ellipsoidal Reflector Lamp	0.01%	60%	0.019	30%	0.000180	O	6.0%	1.98
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	3.60%	10%	4.629	4%	0.000097	L	0.5%	0.76
			Ambient Sub-Cooling - oversized c	7.20%	10%	9.258	5%	0.000097	O	1.3%	0.73
			Economizer for Coolers	3.00%	20%	4.629	20%	0.000097	L	0.5%	3.77
			Evaporative Cooling	7.20%	35%	9.258	5%	0.000097	L	0.5%	2.46
			Evaporator Fan Controller	0.14%	10%	0.185	10%	0.000097	L	0.5%	4.21
			HE Compressors	7.20%	12%	9.258	8%	0.000097	O	2.0%	1.21
			Insulated Suction Lines	7.20%	75%	9.258	1%	0.000097	L	0.5%	0.57
			Liquid Pressure Amplifiers	7.20%	95%	9.258	5%	0.000097	L	0.5%	2.53
			Mechanical Subcooling - additional	7.20%	95%	9.258	5%	0.000097	L	0.5%	1.98
			Parallel Rack Systems	2.80%	10%	9.258	5%	0.000097	L	0.5%	2.46
			VSD on Refrigeration Circulating P	0.12%	10%	0.185	30%	0.000097	H	3.8%	0.66
			VSD on Refrigeration Fan	0.15%	25%	0.185	30%	0.000097	H	3.8%	1.26
		Refrig - RCx / controls	Anti-sweat heater controls	2.51%	24%	3.055	6%	0.000097	O	9.5%	2.34
			Case Lights-off timer (12am and 6a	1.32%	25%	3.055	3%	0.000097	M	1.6%	2.97
			Cooler/Freezer Door Auto Closers	2.00%	25%	4.629	4%	0.000097	H	3.8%	2.76
			Cooler/Freezer Door Gaskets	1.60%	25%	4.629	2%	0.000097	H	3.8%	1.95
			Cycle fan off with thermostat; duty c	2.40%	25%	9.258	5%	0.000097	M	1.6%	5.50
			Defrost Control System	7.20%	55%	9.258	3%	0.000097	L	0.5%	1.63
			Floating Head Pressure Control	6.00%	8%	9.258	7%	0.000097	M	1.6%	1.82
			Refrigeration E-Cube	7.60%	5%	9.258	2%	0.000097	H	3.8%	0.99
			Refrigeration System Maintenance	7.20%	8%	9.258	5%	0.000097	O	4.0%	2.46
			Strip Curtains	3.40%	12%	4.629	4%	0.000097	O	6.5%	2.76
		Lighting controls / design	Bi-level stairwell lighting	0.49%	10%	0.626	50%	0.000180	M	1.6%	0.88
			Daylighting controls	5.25%	1%	8.101	20%	0.000180	O	1.0%	0.42
			Exterior light timers	1.38%	95%	1.600	25%	0.000180	O	3.0%	5.74
			Occupancy Sensor	25.26%	26%	41.754	18%	0.000180	O	4.0%	3.34
			Scheduled interior lighting	34.28%	25%	41.754	10%	0.000180	L	0.5%	3.95

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	0.39%	16%	0.498	15%	0.000854	M	1.6%	1.40
			Desiccant Dehumidification	6.51%	5%	15.068	5%	0.000854	L	0.5%	0.27
			HE Chillers (air and water cooled)	0.39%	60%	0.498	15%	0.000854	H	3.8%	2.46
			HE Motors (VSDs, ECMs, on fans)	11.07%	28%	15.068	2%	0.000854	O	4.0%	3.21
			HE Rooftop AC systems	3.83%	10%	4.918	15%	0.000854	M	1.6%	5.77
			Ultraviolet A/C Coil Cleaning Syster	0.19%	25%	0.243	4%	0.000854	M	1.6%	0.81
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	0.41%	15%	0.498	5%	0.000854	M	1.6%	1.61
			Energy Management System	20.34%	10%	31.391	11%	0.000854	O	2.5%	1.32
			Guest room contls	0.00%	0%	0.347	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	27.13%	20%	31.391	8%	0.000854	O	2.5%	4.16
			HVAC System Retrocommissioning	25.77%	5%	31.391	15%	0.000854	O	2.5%	3.54
			Improve Duct Sealing	12.21%	15%	31.391	1%	0.000854	O	2.5%	5.62
			Insulate Pipes/Lines	27.13%	10%	31.391	1%	0.000854	O	2.5%	0.19
			Programmable Thermostat	9.49%	13%	31.391	4%	0.000854	O	2.5%	2.33
			Time Clock	27.13%	95%	31.391	4%	0.000854	O	2.5%	2.33
			Direct load control AC	1.29%	2%	1.984	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.11%	15%	0.174	60%	-	M	1.6%	0.00
		DHW System improvements	DHW Fuel Switching (elec to gas)	1.49%	20%	5.208	100%	0.000165	L	0.5%	1.12
			Grey Water Heat Exchanger	2.97%	8%	5.208	5%	0.000165	L	0.5%	1.71
			Heat Trap	2.97%	60%	5.208	5%	0.000165	M	1.6%	1.71
			Insulating Blankets	2.25%	65%	5.208	4%	0.000165	M	1.6%	1.57
			Pipe Insulation	0.34%	25%	0.521	1%	0.000165	M	1.6%	1.92
			Reduced Temperature Setpoints	2.97%	50%	5.208	19%	0.000165	O	2.5%	10.51
			Timers	2.97%	60%	5.208	5%	0.000165	O	2.5%	3.65
			Water Heater Cycling	2.97%	60%	5.208	5%	0.000165	O	2.5%	3.65
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.40%	20%	0.463	45%	0.000180	H	3.8%	2.89
			HE Battery Charging Station	0.10%	10%	0.116	35%	0.000180	M	1.6%	1.82
			Plug Load Sensors	4.50%	70%	5.208	20%	0.000180	L	0.5%	2.31
			Power Management Software	0.95%	25%	1.157	15%	0.000180	M	1.6%	1.93
		Faucets / Nozzles	Faucet Aerators	0.43%	40%	0.521	20%	0.000165	M	1.6%	6.55
			Low Flow Pre-Rinse Nozzles	0.20%	45%	0.521	55%	0.000165	M	1.6%	9.76
			Low Flow Showerhead	0.20%	15%	0.521	1%	0.000165	M	1.6%	2.82
			Ultrasonic Faucet Control	0.41%	15%	0.521	3%	0.000165	M	1.6%	1.18
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	1.621	100%	-	M	1.6%	1.62
		Process equip	TOD Pool Pump Timer	0.00%	5%	0.000	10%	0.000165	M	1.6%	3.53
			Vendor Miser	0.02%	30%	0.023	46%	0.000180	M	1.6%	1.62
		Shell improvement	Shell: Insulating and Air Sealing	23.06%	15%	31.391	12%	0.000802	L	0.5%	1.68
			Shell: Reduced Solar Gain	23.06%	25%	31.391	10%	0.000802	M	1.6%	0.12
		Refrig - Displays	New case doors	0.75%	5%	0.917	10%	0.000097	O	6.5%	1.52
			Night Covers for Display Cases	2.51%	12%	3.055	6%	0.000097	H	3.8%	1.01
			Refrigerated Case Doors - Door Mis	2.51%	8%	3.055	10%	0.000097	H	3.8%	2.76
			Refrigerated Case Doors - Low/No	2.51%	5%	3.055	3%	0.000097	O	6.5%	7.44

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service	ROB	Lighting equipment	CFL Screw in	1.23%	40%	0.982	71%	0.000180	M	5.0%	3.10
			HPT8 Fixture to replace T8	19.48%	30%	2.652	11%	0.000180	O	20.0%	0.40
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000180	H	12.5%	3.21
			LED Task Lighting	1.48%	1%	0.223	35%	0.000180	M	5.0%	0.33
		Refrig - Cooler/Freezer equip	ECM Motors on fans	6.00%	51%	0.780	7%	0.000097	O	6.3%	3.13
			Evaporative Cooling	7.20%	10%	1.089	5%	0.000097	L	0.5%	2.46
			HE Compressors	7.20%	12%	0.780	8%	0.000097	O	15.0%	6.00
			PSC Motors on fans	7.20%	31%	0.780	1%	0.000097	M	5.0%	0.59
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.09%	5%	0.014	65%	-	L	0.5%	0.00
			HE Dishwashers	0.88%	20%	0.184	25%	0.000165	M	5.0%	0.93
		Cooling Equipment	HE Chillers (air and water cooled)	0.39%	33%	0.030	25%	0.000854	H	12.5%	1.80
			HE Packaged AC (non rooftop)	0.95%	25%	0.124	16%	0.000854	O	10.0%	4.04
			HE Rooftop AC systems	0.95%	10%	0.124	25%	0.000854	O	10.0%	4.25
			PTAC and PTHP	0.27%	15%	0.029	30%	0.000854	O	10.0%	0.87
			Geothermal Heat Pumps	0.02%	5%	0.020	36%	0.000854	O	5.0%	1.55
		Process equip: cooking	Connectionless (Boilerless) Steame	0.04%	25%	0.007	50%	-	L	0.5%	0.00
			HE (ES) Fryers	0.03%	25%	0.007	15%	-	L	0.5%	0.00
			HE (ES) Hot Food Holding Cabinet	0.09%	25%	0.014	60%	-	L	0.5%	0.00
			HE (ES) Steam Cookers / Steamer	0.04%	25%	0.007	50%	-	L	0.5%	0.00
			HE Broilers	0.05%	40%	0.007	18%	-	L	0.5%	0.00
			HE Griddles	0.05%	40%	0.007	32%	-	L	0.5%	0.00
			HE Induction Cooking	0.05%	25%	0.007	0%	-	L	0.5%	0.00
			HE Ovens	0.05%	33%	0.007	2%	0.000180	L	0.5%	0.08
			Solid State Temperature Controls	0.01%	15%	0.001	15%	0.000180	M	5.0%	0.19
		DHW System improvements	HE Water Heaters	4.50%	35%	0.612	5%	0.000165	M	5.0%	2.76
			Heat Pump Water Heating	3.56%	5%	0.735	59%	0.000165	M	5.0%	1.38
		Data / computing / office equip	HE (ES) Computers	1.00%	75%	0.186	25%	0.000180	M	5.0%	1.65
			HE (ES) Other Office Equipment	1.00%	65%	0.136	25%	0.000180	M	5.0%	1.93
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.073	8%	-	O	5.0%	2.68
		Process equip	HE (ES) Icemakers	2.00%	25%	0.272	25%	0.000180	L	0.5%	1.37
			HE (ES) Refrig. Bev. Vending Mach	0.02%	25%	0.003	20%	0.000180	M	5.0%	0.83
			HE (ES) Water Cooler	0.07%	25%	0.014	15%	0.000180	M	5.0%	0.28
			HE Commercial Clothes Dryers	0.50%	20%	0.068	10%	-	M	5.0%	0.00
			HE Commercial Clothes Washers	0.50%	43%	0.068	35%	-	M	5.0%	0.00
			Low Pressure Drop Pool Filter	0.00%	5%	0.000	5%	0.000165	M	5.0%	0.57
		Clotheswashing	HE Clothes Washers	0.68%	20%	0.184	45%	0.000165	M	5.0%	0.63

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	NC	Pool	Solar Pool Heater	0.00%	0%	0.007	40%	0.000281	L	0.5%	1.18
		Lighting equipment	CFL Fixture	0.65%	50%	0.026	69%	0.000286	M	5.0%	3.53
			Electronic ballast	7.29%	90%	0.261	30%	0.000286	H	12.5%	1.81
			HPT8 Fixture to replace T8	8.55%	10%	0.306	11%	0.000286	O	30.0%	0.69
			LED Exterior Lighting	0.44%	1%	0.021	90%	0.000286	O	2.5%	0.44
			LED Task Lighting	0.65%	1%	0.026	35%	0.000286	O	2.5%	0.20
		Refrig - Cooler/Freezer equip	Economizer for Coolers	21.75%	20%	1.039	20%	-	M	5.0%	0.00
		Refrig - RCx / controls	Floating Head Pressure Control	43.50%	40%	2.078	30%	0.000374	L	0.5%	1.57
		Lighting controls / design	Bi-level stairwell lighting	0.21%	40%	0.009	50%	0.000286	M	5.0%	3.95
			Efficient lighting design/layout	18.00%	30%	0.645	20%	0.000286	O	3.4%	2.37
		Cooling Equipment	Desiccant Dehumidification	8.14%	5%	0.389	5%	0.002538	L	0.5%	1.18
			Economizer	1.95%	84%	0.078	20%	0.002538	M	5.0%	6.14
		HVAC RCx / Controls	Energy Management System	12.88%	50%	0.486	10%	0.002538	M	5.0%	4.06
			HVAC System Commissioning	12.88%	5%	0.486	10%	0.002538	H	12.5%	2.52
			Thermal Energy Storage	0.00%	0%	0.000	0%	5.937500	H	13.0%	0.95
		DHW System improvements	HE Water Heating System Design	0.15%	15%	0.036	5%	0.000281	M	5.0%	3.64
			Heat Recovery for Hot Water Use	0.75%	28%	0.036	40%	0.000374	M	5.0%	9.46
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.08%	50%	0.003	40%	0.000286	H	12.5%	5.25
		Shell improvement	High performance integrated desig	10.17%	15%	0.486	30%	0.002538	H	12.5%	2.86
			Shell: Improved Insulation and Air	12.88%	65%	0.486	8%	0.002385	M	5.0%	4.28
			Shell: Reduced Solar Gain	12.21%	25%	0.486	3%	0.002385	H	12.5%	2.39

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	Retrofit	Pool	Pool Cover	0.18%	5%	0.407	60%	0.000281	M	1.6%	0.89
		Lighting equipment	Advanced Metal Halide	0.72%	15%	2.931	30%	0.000286	O	10.0%	1.12
			CFL Screw in	0.54%	40%	1.465	71%	0.000286	O	4.0%	2.41
			Electronic ballast	7.29%	90%	14.829	30%	0.000286	O	6.3%	0.50
			HE Halogen	0.54%	20%	1.465	30%	0.000286	M	1.6%	6.56
			HO T5 lamps	1.08%	60%	2.931	45%	0.000286	O	6.3%	1.71
			HPT8 Fixture to replace T12	8.03%	30%	16.349	28%	0.000286	O	6.3%	1.07
			Induction	0.53%	5%	1.206	10%	0.000286	O	6.3%	0.58
			LED Exit Lights	0.10%	60%	0.220	75%	0.000286	H	3.8%	0.84
			LED Exterior Lighting	0.44%	1%	1.206	90%	0.000286	M	1.6%	0.34
			LED Traffic lights	0.00%	1%	0.000	90%	0.000286	M	1.6%	0.29
			Upgrade Ellipsoidal Reflector Lamp	0.01%	80%	0.015	30%	0.000286	O	6.0%	1.50
		Refrig - Cooler/Freezer equip	Air Curtain Technologies	26.10%	10%	59.020	4%	0.000374	L	0.5%	0.60
			Ambient Sub-Cooling - oversized c	52.20%	10%	118.041	5%	0.000374	O	1.3%	0.58
			Economizer for Coolers	21.75%	20%	59.020	20%	0.000374	L	0.5%	3.25
			Evaporative Cooling	52.20%	35%	118.041	5%	0.000374	L	0.5%	2.04
			Evaporator Fan Controller	1.04%	10%	2.361	10%	0.000374	L	0.5%	3.63
			HE Compressors	52.20%	12%	118.041	8%	0.000374	O	2.0%	0.97
			Insulated Suction Lines	52.20%	75%	118.041	1%	0.000374	L	0.5%	0.45
			Liquid Pressure Amplifiers	52.20%	95%	118.041	5%	0.000374	L	0.5%	2.09
			Mechanical Subcooling - additional	52.20%	95%	118.041	5%	0.000374	L	0.5%	1.62
			Parallel Rack Systems	20.30%	10%	118.041	5%	0.000374	L	0.5%	2.04
			VSD on Refrigeration Circulating P	0.87%	10%	2.361	30%	0.000374	H	3.8%	0.52
			VSD on Refrigeration Fan	1.07%	25%	2.361	30%	0.000374	H	3.8%	1.01
		Refrig - RCx / controls	Anti-sweat heater controls	0.95%	24%	2.035	6%	0.000374	H	10.0%	1.93
			Case Lights-off timer (12am and 6a	0.50%	25%	2.035	3%	0.000374	M	1.6%	2.45
			Cooler/Freezer Door Auto Closers	14.50%	25%	59.020	4%	0.000374	H	3.8%	2.28
			Cooler/Freezer Door Gaskets	11.60%	25%	59.020	2%	0.000374	H	3.8%	1.70
			Cycle fan off with thermostat; duty c	17.40%	25%	118.041	5%	0.000374	M	1.6%	4.83
			Defrost Control System	52.20%	55%	118.041	3%	0.000374	L	0.5%	1.32
			Floating Head Pressure Control	43.50%	25%	118.041	30%	0.000374	L	0.5%	1.13
			Refrigeration E-Cube	55.10%	5%	118.041	2%	0.000374	H	3.8%	0.79
			Refrigeration System Maintenance	52.20%	8%	118.041	5%	0.000374	O	4.0%	2.04
			Strip Curtains	24.65%	22%	59.020	4%	0.000374	O	6.5%	2.28
		Lighting controls / design	Bi-level stairwell lighting	0.21%	20%	0.484	50%	0.000286	M	1.6%	0.65
			Daylighting controls	2.25%	1%	6.106	20%	0.000286	O	1.0%	0.43
			Exterior light timers	0.59%	95%	1.206	25%	0.000286	O	3.0%	4.58
			Occupancy Sensor	11.09%	26%	32.237	18%	0.000286	O	4.0%	3.60
			Scheduled interior lighting	15.05%	40%	32.237	10%	0.000286	M	1.6%	4.13

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	Retrofit	Cooling Equipment	Chilled Water Free Cooling Control	0.61%	68%	1.384	15%	0.002538	M	1.6%	1.61
			Desiccant Dehumidification	5.43%	5%	22.082	5%	0.002538	L	0.5%	0.30
			HE Chillers (air and water cooled)	0.61%	60%	1.384	15%	0.002538	H	3.8%	2.90
			HE Motors (VSDs, ECMs, on fans)	9.22%	28%	22.082	2%	0.002538	O	4.0%	5.68
			HE Rooftop AC systems	0.70%	10%	1.587	8%	0.002538	M	1.6%	7.37
			Ultraviolet A/C Coil Cleaning Syster	0.19%	25%	0.427	4%	0.002538	M	1.6%	0.92
		HVAC RCx / Controls	Chilled Water Reset, Optimizer for	0.65%	15%	1.384	5%	0.002538	M	1.6%	1.85
			Energy Management System	10.17%	10%	27.602	11%	0.002538	O	2.5%	1.05
			Guest room contls	0.00%	0%	0.590	0%	-	M	1.6%	0.00
			HVAC System maintenance (servic	13.56%	20%	27.602	8%	0.002538	O	2.5%	3.31
			HVAC System Retrocommissioning	12.88%	5%	27.602	15%	0.002538	O	2.5%	3.22
			Improve Duct Sealing	6.10%	15%	27.602	1%	0.002538	O	2.5%	5.32
			Insulate Pipes/Lines	13.56%	20%	27.602	1%	0.002538	O	2.5%	1.03
			Programmable Thermostat	4.75%	13%	27.602	4%	0.002538	O	2.5%	1.85
			Time Clock	13.56%	95%	27.602	4%	0.002538	O	2.5%	1.85
			Direct load control AC	0.00%	2%	0.000	0%	5.937500	H	2.5%	4.07
		Process equip: cooking	HE Ventilation Hoods	0.05%	15%	0.122	60%	-	M	1.6%	0.00
		DHW System improvements	DHW Fuel Switching (elec to gas)	0.33%	20%	2.035	100%	0.000281	L	0.5%	1.06
			Grey Water Heat Exchanger	0.66%	8%	2.035	5%	0.000281	L	0.5%	1.28
			Heat Trap	0.66%	60%	2.035	5%	0.000281	M	1.6%	1.28
			Insulating Blankets	0.50%	65%	2.035	4%	0.000281	M	1.6%	1.17
			Pipe Insulation	0.08%	25%	0.204	1%	0.000281	M	1.6%	1.43
			Reduced Temperature Setpoints	0.66%	50%	2.035	19%	0.000281	O	2.5%	9.85
			Timers	0.66%	60%	2.035	5%	0.000281	O	2.5%	2.85
			Water Heater Cycling	0.66%	60%	2.035	5%	0.000281	O	2.5%	2.85
		Data / computing / office equip	Energy Efficient Data Centers (virtu	0.08%	20%	0.163	45%	0.000286	H	3.8%	2.22
			HE Battery Charging Station	0.02%	10%	0.041	35%	0.000286	M	1.6%	1.42
			Plug Load Sensors	0.90%	70%	1.832	20%	0.000286	L	0.5%	1.82
			Power Management Software	0.19%	25%	0.407	15%	0.000286	M	1.6%	1.51
		Faucets / Nozzles	Faucet Aerators	0.10%	40%	0.204	20%	0.000281	M	1.6%	5.41
			Low Flow Pre-Rinse Nozzles	0.05%	45%	0.204	55%	0.000281	M	1.6%	8.69
			Low Flow Showerhead	0.05%	15%	0.204	0%	-	M	1.6%	0.00
			Ultrasonic Faucet Control	0.09%	5%	0.204	3%	0.000281	M	1.6%	0.87
		Elec heating	Fuel Switching (elec to gas)	0.70%	0%	2.851	100%	-	M	1.6%	1.54
		Process equip	TOD Pool Pump Timer	0.20%	5%	0.407	10%	0.000281	M	1.6%	2.73
			Vendor Miser	0.01%	30%	0.016	46%	0.000286	M	1.6%	1.71
		Shell improvement	Shell: Insulating and Air Sealing	11.53%	15%	27.602	12%	0.002385	L	0.5%	1.28
			Shell: Reduced Solar Gain	11.53%	25%	27.602	3%	0.002385	M	1.6%	0.14
		Refrig - Displays	New case doors	0.29%	8%	0.611	10%	0.000374	O	6.5%	1.23
			Night Covers for Display Cases	0.95%	12%	2.035	6%	0.000374	H	3.8%	0.80
			Refrigerated Case Doors - Door Mis	0.95%	8%	2.035	10%	0.000374	H	3.8%	2.28
			Refrigerated Case Doors - Low/No	0.95%	5%	2.035	3%	0.000374	O	6.5%	7.04

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	ROB	Lighting equipment	CFL Screw in	0.54%	40%	0.758	71%	0.000286	M	5.0%	2.41
			HPT8 Fixture to replace T8	8.55%	20%	2.047	11%	0.000286	O	20.0%	0.40
			LED Refrigerated Case Door Lighti	0.00%	0%	0.000	25%	0.000286	H	12.5%	2.46
			LED Task Lighting	0.65%	1%	0.172	35%	0.000286	M	5.0%	0.24
		Refrig - Cooler/Freezer equip	ECM Motors on fans	43.50%	51%	9.947	7%	0.000374	O	6.3%	2.65
			Evaporative Cooling	52.20%	10%	13.882	5%	0.000374	L	0.5%	2.04
			HE Compressors	52.20%	12%	9.947	8%	0.000374	O	15.0%	5.52
			PSC Motors on fans	52.20%	31%	9.947	1%	0.000374	M	5.0%	0.47
		Dishwashing	Chemical Sanitizing (Low Temp) Di	0.03%	5%	0.010	65%	-	L	0.5%	0.00
			HE Dishwashers	0.20%	20%	0.072	25%	0.000281	M	5.0%	0.99
		Cooling Equipment	HE Chillers (air and water cooled)	0.61%	33%	0.085	25%	0.002538	H	12.5%	2.10
			HE Packaged AC (non rooftop)	0.94%	25%	0.214	16%	0.002538	O	10.0%	4.87
			HE Rooftop AC systems	0.94%	10%	0.214	17%	0.002538	O	10.0%	5.28
			PTAC and PTHP	0.26%	15%	0.050	30%	0.002538	O	10.0%	1.02
			Geothermal Heat Pumps	0.02%	5%	0.035	36%	0.002538	O	5.0%	1.60
		Process equip: cooking	Connectionless (Boilerless) Steame	0.02%	25%	0.005	50%	-	L	0.5%	0.00
			HE (ES) Fryers	0.01%	25%	0.005	15%	-	L	0.5%	0.00
			HE (ES) Hot Food Holding Cabinet	0.04%	25%	0.010	60%	-	L	0.5%	0.00
			HE (ES) Steam Cookers / Steamer	0.02%	25%	0.005	50%	-	L	0.5%	0.00
			HE Broilers	0.02%	40%	0.005	18%	-	L	0.5%	0.00
			HE Griddles	0.02%	40%	0.005	32%	-	L	0.5%	0.00
			HE Induction Cooking	0.02%	25%	0.005	0%	-	L	0.5%	0.00
			HE Ovens	0.02%	33%	0.005	2%	0.000286	L	0.5%	0.06
			Solid State Temperature Controls	0.00%	15%	0.001	15%	0.000286	M	5.0%	0.20
		DHW System improvements	HE Water Heaters	1.00%	35%	0.239	5%	0.000281	M	5.0%	2.94
			Heat Pump Water Heating	3.56%	5%	1.292	59%	0.000281	M	5.0%	1.02
		Data / computing / office equip	HE (ES) Computers	0.20%	75%	0.065	25%	0.000286	M	5.0%	1.28
			HE (ES) Other Office Equipment	0.20%	65%	0.048	25%	0.000286	M	5.0%	1.51
		Elec heating	HE Air Source Heat Pumps - heatir	0.23%	33%	0.128	8%	-	O	5.0%	1.97
		Process equip	HE (ES) Icemakers	0.40%	25%	0.096	25%	0.000286	L	0.5%	1.47
			HE (ES) Refrig. Bev. Vending Mach	0.00%	25%	0.002	20%	0.000286	M	5.0%	0.87
			HE (ES) Water Cooler	0.01%	25%	0.005	15%	0.000286	M	5.0%	0.30
			HE Commercial Clothes Dryers	0.10%	20%	0.024	10%	-	M	5.0%	0.00
			HE Commercial Clothes Washers	0.10%	43%	0.024	35%	-	M	5.0%	0.00
			Low Pressure Drop Pool Filter	0.18%	5%	0.414	5%	0.000281	M	5.0%	0.42
		Clotheswashing	HE Clothes Washers	0.15%	20%	0.072	45%	0.000281	M	5.0%	0.68

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Education	NC	DHW	Grey Water Heat Exchanger	14%	8%	3	30%	10	M	5%	4.72
			HE Water Heaters	17%	35%	3.2615	15%	10	H	13%	5.30
			HE Water Heating System Design	22%	5%	3.2615	5%	15	M	5%	3.91
		Heating - Furnace	Combination Water Heater/Furnace	4%	1%	1	14%	15	L	1%	3.21
		Heating	Heat Recovery: Air to Air	14%	14%	3	40%	15	M	5%	4.61
			Micro Channel Heat Exchangers	25%	0%	4	5%	15	M	0.05	2.82
			Radiant floor heating	4%	5%	3.7912	12%	15	M	0.05	2.06
			Solar ventilation pre-heat	2%	0%	3	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	53%	50%	8	4%	20	M	5%	2.49
	Retrofit	DHW	Grey Water Heat Exchanger	14%	8%	185	30%	10	L	1%	0.51
			Heat Trap	22%	35%	185.31	5%	10	M	2%	6.56
			Insulating Blankets	11%	65%	185.31	4%	5	M	0.0156	10.25
			Pipe Insulation	16%	25%	185.31	1%	5	M	0.0156	3.45
			Reduced Temperature Setpoints	0.162	85%	185.31	6%	10	O	3%	11.71
			Timers	22%	40%	185.31	5%	10	O	0.025	6.56
			Water Heater Cycling	0.216	0.4	185.31	0.05	10	O	0.025	6.56
		Pool	Pool Cover	2%	50%	21	60%	10	L	1%	10.67
			TOD Pool Pump Timer	2%	30%	20.59	10%	5	L	0.005	19.41
		Heating - Boiler	Boiler - Automatic Chemical feed	27%	10%	254	15%	15	L	0.005	3.43
			Boiler - Steam System Isolation	13%	0.1	120	0.15	20	L	0.005	2.16
			Boiler - Steam to Hot Water Conversion	7%	0.1	120.44	10%	15	M	2%	4.37
			Boiler Blowdown Heat Exchanger	22%	1%	254	4%	15	L	1%	0.62
			Boiler Controls / Cx and RCx	28%	5%	253.69	15%	15	O	3%	2.18
			HE Boilers	15%	49%	253.69	25%	15	H	4%	1.13
			Heating Stack Economizer	22%	40%	253.69	4%	15	M	2%	0.81
			Steam Trap Maintenance	13%	55%	120	17%	2	O	3%	3.48
		DHW - faucet	Faucet Aerators	2%	40%	19	3%	5	M	2%	18.53
			Ultrasonic Faucet Control	2%	25%	18.531	3%	10	M	0.0156	8.03
			Low Flow Rinse/Nozzles	1%	45%	18.531	55%	5	H	4%	26.22
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	18.531	65%	15	L	1%	2.70
			Wastewater Reclamation	2%	0.05	18.531	40%	15	L	0.005	1.74
		Vent hoods	HE Ventilation Hoods	1%	15%	17	60%	10	M	2%	3.81
		Heating	Heat Recovery: Air to Air	14%	14%	158	40%	15	M	0.0156	1.36
			Insulate Pipes/Lines	56%	10%	479	3%	5	O	3%	0.97
			Solar ventilation pre-heat	2%	0%	158	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	49%	50%	479	5%	20	L	0.005	0.46
		DHW - showers	Low Flow Showerhead	1%	15%	19	1%	10	H	4%	11.71

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Education	ROB	DHW	HE Water Heaters	21%	25%	22	25%	15	M	5%	7.85
			Heat Pump Water Heating	2%	5%	21.793	100%	15	L	1%	7.51
		Pool	HE Gas Pool Water Heater	2%	30%	2	25%	10	M	5%	12.82
		Heating - Boiler	HE Boilers	15%	49%	21	15%	15	M	0.05	5.74
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	2	65%	10	L	1%	11.18
			HE Dishwashers	4%	20%	7	25%	10	M	5%	2.62
		Heating - Furnace	HE Furnaces (<=300kBTU)	2%	45%	1	19%	15	M	0.05	2.70
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	1	50%	10	L	1%	12.82
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.6558	5%	10	L	0.005	2.26
		Fryers	HE (ES) Fryers	0%	0.25	0.6558	15%	10	M	5%	5.80
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	1	7%	10	L	1%	3.06
		Broilers	HE Broilers	1%	40%	1	19%	10	L	0.005	10.88
		DHW - Clotheswa	HE Clothes Washers	3%	20%	7	5%	10	M	5%	4.76
		Griddles	HE Griddles	1%	40%	1	6%	10	L	1%	2.47
		Ovens	HE Ovens	0.007	50%	0.6558	66%	10	M	5%	11.28
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	0%	0.5	0	6%	10	M	0.05	2.69
Food Sales	NC	DHW	Grey Water Heat Exchanger	15%	8%	1	30%	10	M	0.05	8.57
			HE Water Heaters	18%	35%	0.5763	15%	10	H	13%	9.41
			HE Water Heating System Design	23%	5%	0.5763	5%	15	M	5%	7.19
		Heating - Furnace	Combination Water Heater/Furnace	19%	1%	1	14%	15	L	1%	6.11
		Heating	Heat Recovery: Air to Air	13%	14%	0	40%	15	M	5%	1.90
			Micro Channel Heat Exchangers	24%	0%	1	5%	15	M	0.05	5.46
			Radiant floor heating	4%	5%	0.6003	12%	15	M	0.05	4.57
			Solar ventilation pre-heat	2%	0%	0	15%	15	L	1%	3.07
		Heating	Improved Roof/Ceiling Insulation	50%	50%	1	4%	20	M	5%	1.61
	Retrofit	DHW	Grey Water Heat Exchanger	15%	8%	33	30%	10	L	1%	1.10
			Heat Trap	23%	35%	32.747	5%	10	M	2%	11.14
			Insulating Blankets	11%	65%	32.747	4%	5	M	0.0156	15.98
			Pipe Insulation	17%	25%	32.747	1%	5	M	0.0156	6.67
			Reduced Temperature Setpoints	0.169	50%	32.747	6%	10	O	3%	16.86
			Timers	23%	40%	32.747	5%	10	O	0.025	11.14
			Water Heater Cycling	0.225	0.4	32.747	0.05	10	O	0.025	11.14
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	15.85
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	23.99
		Heating - Boiler	Boiler - Automatic Chemical feed	0	10%	0	15%	15	L	0.005	6.47
			Boiler - Steam System Isolation	0	0.1	0	0.15	20	L	0.005	4.26
			Boiler - Steam to Hot Water Conversion	0	0.1	0	10%	15	M	2%	7.94
			Boiler Blowdown Heat Exchanger	0	1%	0	4%	15	L	1%	1.33
			Boiler Controls / Cx and RCx	0	5%	0	15%	15	O	3%	2.38

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Food Sales	Retrofit	Heating - Boiler	HE Boilers	0	49%	0	25%	15	M	2%	1.48
			Heating Stack Economizer	0	10%	0	4%	15	M	0.0156	1.72
			Steam Trap Maintenance	0	30%	0	17%	2	O	3%	5.92
		DHW - faucet	Faucet Aerators	2%	40%	3	1%	5	M	2%	23.37
			Ultrasonic Faucet Control	2%	5%	3.2747	3%	10	M	0.0156	12.97
			Low Flow Rinse/Nozzles	1%	45%	3.2747	55%	5	H	4%	28.09
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	3.2747	65%	15	L	1%	5.23
			Wastewater Reclamation	2%	0.05	3.2747	40%	15	L	0.005	3.51
		Vent hoods	HE Ventilation Hoods	2%	15%	4	60%	10	M	2%	7.16
		Heating	Heat Recovery: Air to Air	13%	14%	25	40%	15	M	0.0156	0.75
			Insulate Pipes/Lines	52%	10%	76	3%	5	O	3%	2.05
			Solar ventilation pre-heat	2%	0%	25	15%	15	L	1%	3.07
		Heating	Improved Roof/Ceiling Insulation	46%	50%	76	5%	20	L	0.005	0.29
		DHW - showers	Low Flow Showerhead	1%	15%	3	1%	10	H	4%	16.86
	ROB	DHW	HE Water Heaters	21%	25%	4	25%	15	M	5%	12.38
			Heat Pump Water Heating	2%	5%	3.851	100%	15	L	1%	10.22
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	17.88
		Heating - Boiler	HE Boilers	0	49%	0	15%	15	M	0.05	10.39
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	0	65%	10	L	1%	16.36
			HE Dishwashers	4%	20%	1	3%	10	M	5%	5.15
		Heating - Furnace	HE Furnaces (<=300kBTU)	47%	45%	6	19%	15	M	0.05	5.25
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	0	50%	10	L	1%	17.88
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.1455	5%	10	L	0.005	4.51
		Fryers	HE (ES) Fryers	0%	0.25	0.1455	15%	10	M	5%	10.12
		Cabinets	HE (ES) Hot Food Holding Cabinets	2%	0.25	0	7%	10	L	1%	5.92
		Broilers	HE Broilers	1%	40%	0	19%	10	L	0.005	11.50
		DHW - Clotheswa	HE Clothes Washers	3%	20%	1	7%	10	M	5%	8.63
		Griddles	HE Griddles	1%	40%	0	6%	10	L	1%	4.88
		Ovens	HE Ovens	0.009	33%	0.1455	66%	10	M	5%	16.46
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	7%	50%	1	6%	10	M	0.05	2.96
Food Servic	NC	DHW	Grey Water Heat Exchanger	16%	8%	2	25%	10	M	0.05	8.03
			HE Water Heaters	19%	35%	2.2277	15%	10	H	13%	8.84
			HE Water Heating System Design	24%	5%	2.2277	5%	15	M	5%	6.72
		Heating - Furnace	Combination Water Heater/Furnace	12%	1%	1	14%	15	L	1%	5.68
		Heating	Heat Recovery: Air to Air	8%	7%	1	40%	15	M	5%	1.80
			Micro Channel Heat Exchangers	14%	0%	1	5%	15	M	0.05	5.07
			Radiant floor heating	2%	5%	1.3043	12%	15	M	0.05	4.23
			Solar ventilation pre-heat	1%	0%	1	15%	15	L	1%	2.82
		Heating	Improved Roof/Ceiling Insulation	30%	50%	3	4%	20	M	5%	1.19

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	Retrofit	DHW	Grey Water Heat Exchanger	16%	8%	127	25%	10	L	1%	1.00
			Heat Trap	24%	35%	126.57	5%	10	M	2%	10.53
			Insulating Blankets	12%	65%	126.57	4%	5	M	0.0156	15.27
			Pipe Insulation	18%	25%	126.57	1%	5	M	0.0156	6.19
			Reduced Temperature Setpoints	0.182	50%	126.57	6%	10	O	3%	16.26
			Timers	24%	40%	126.57	5%	10	O	0.025	10.53
			Water Heater Cycling	0.243	0.4	126.57	0.05	10	O	0.025	10.53
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	15.23
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	23.53
		Heating - Boiler	Boiler - Automatic Chemical feed	1%	10%	5	15%	15	L	0.005	6.03
			Boiler - Steam System Isolation	0%	0.1	3	0.15	20	L	0.005	3.94
			Boiler - Steam to Hot Water Conversion	0%	0.1	2.5931	10%	15	M	2%	7.44
			Boiler Blowdown Heat Exchanger	1%	1%	5	4%	15	L	1%	1.21
			Boiler Controls / Cx and RCx	1%	5%	5.1861	15%	15	O	3%	2.18
			HE Boilers	1%	49%	5.1861	25%	15	M	2%	1.36
			Heating Stack Economizer	1%	10%	5.1861	4%	15	M	0.0156	1.58
			Steam Trap Maintenance	1%	30%	3	17%	2	O	3%	6.30
		DHW - faucet	Faucet Aerators	2%	40%	13	1%	5	M	2%	22.87
			Ultrasonic Faucet Control	2%	25%	12.657	3%	10	M	0.0156	12.34
			Low Flow Rinse/Nozzles	1%	45%	12.657	55%	5	H	4%	27.93
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	12.657	65%	15	L	1%	4.85
			Wastewater Reclamation	2%	0.05	12.657	40%	15	L	0.005	3.24
		Vent hoods	HE Ventilation Hoods	4%	15%	29	60%	10	M	2%	6.67
		Heating	Heat Recovery: Air to Air	8%	7%	54	40%	15	M	0.0156	0.76
			Insulate Pipes/Lines	32%	20%	165	3%	5	O	3%	1.87
			Solar ventilation pre-heat	1%	0%	54	15%	15	L	1%	2.82
		Heating	Improved Roof/Ceiling Insulation	28%	50%	165	5%	20	L	0.005	0.21
		DHW - showers	Low Flow Showerhead	1%	15%	13	1%	10	H	4%	16.26
	ROB	DHW	HE Water Heaters	23%	25%	15	25%	15	M	5%	11.82
			Heat Pump Water Heating	2%	5%	14.885	100%	15	L	1%	10.05
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	17.31
		Heating - Boiler	HE Boilers	1%	49%	0	15%	15	M	0.05	9.32
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	1	65%	10	L	1%	15.75
			HE Dishwashers	5%	20%	4	25%	10	M	5%	4.76
		Heating - Furnace	HE Furnaces (<=300kBTU)	31%	45%	15	19%	15	M	0.05	4.87
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	1	50%	10	L	1%	17.31
			HE (ES) Steam Cookers / Steamers	2%	0.25	1.1332	5%	10	L	0.005	4.17
		Fryers	HE (ES) Fryers	1%	0.25	1.1332	15%	10	M	5%	9.52
		Cabinets	HE (ES) Hot Food Holding Cabinets	3%	0.25	2	7%	10	L	1%	5.49
		Broilers	HE Broilers	2%	0.25	1	19%	10	L	0.005	15.45

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Servic	ROB	DHW - Clotheswa	HE Clothes Washers	4%	20%	4	35%	10	M	5%	8.08
		Griddles	HE Griddles	2%	25%	1	6%	10	L	1%	4.51
		Ovens	HE Ovens	0.019	20%	1.1332	66%	10	M	5%	15.85
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	3%	50%	2	6%	10	M	0.05	2.74
Health Care	NC	DHW	Grey Water Heat Exchanger	22%	8%	4	30%	10	M	0.05	11.07
			HE Water Heaters	27%	35%	3.9955	15%	10	H	13%	12.00
			HE Water Heating System Design	33%	5%	3.9955	5%	15	M	5%	9.38
		Heating - Furnace	Combination Water Heater/Furnace	9%	1%	1	14%	15	L	1%	2.71
		Heating	Heat Recovery: Air to Air	10%	14%	2	40%	15	M	5%	2.80
			Micro Channel Heat Exchangers	19%	0%	2	5%	15	M	0.05	2.51
			Radiant floor heating	3%	5%	2.2595	12%	15	M	0.05	1.57
			Solar ventilation pre-heat	1%	0%	2	15%	15	L	1%	1.27
		Heating	Improved Roof/Ceiling Insulation	40%	50%	5	4%	20	M	5%	1.34
	Retrofit	DHW	Grey Water Heat Exchanger	22%	8%	227	30%	10	L	1%	1.62
			Heat Trap	33%	35%	227.02	5%	10	M	2%	13.82
			Insulating Blankets	17%	65%	227.02	4%	5	M	0.0156	18.91
			Pipe Insulation	25%	25%	227.02	1%	5	M	0.0156	9.00
			Reduced Temperature Setpoints	0.25	0.25	227.02	6%	10	O	3%	19.21
			Timers	33%	40%	227.02	5%	10	O	0.025	13.82
			Water Heater Cycling	0.333	0.4	227.02	0.05	10	O	0.025	13.82
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	18.32
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	25.68
		Heating - Boiler	Boiler - Automatic Chemical feed	11%	10%	84	15%	15	L	0.005	8.59
			Boiler - Steam System Isolation	5%	0.1	40	0.15	20	L	0.005	4.47
			Boiler - Steam to Hot Water Conversion	3%	0.1	40.047	10%	15	M	2%	10.27
			Boiler Blowdown Heat Exchanger	9%	1%	84	4%	15	L	1%	0.81
			Boiler Controls / Cx and RCx	12%	5%	84.168	15%	15	O	3%	3.40
			HE Boilers	6%	49%	84.168	25%	15	H	4%	2.16
			Heating Stack Economizer	9%	40%	84.168	4%	15	M	2%	2.50
			Steam Trap Maintenance	6%	30%	40	17%	2	O	3%	5.92
		DHW - faucet	Faucet Aerators	3%	40%	23	4%	5	M	2%	25.20
			Ultrasonic Faucet Control	3%	10%	22.702	3%	10	M	0.0156	15.64
			Low Flow Rinse/Nozzles	1%	45%	22.702	55%	5	H	4%	28.66
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	22.702	65%	15	L	1%	7.07
			Wastewater Reclamation	2%	0.05	22.702	40%	15	L	0.005	4.91
		Vent hoods	HE Ventilation Hoods	2%	15%	15	60%	10	M	2%	9.46
		Heating	Heat Recovery: Air to Air	10%	14%	94	40%	15	M	0.0156	1.38
			Insulate Pipes/Lines	42%	10%	285	3%	5	O	3%	0.68
			Solar ventilation pre-heat	1%	0%	94	15%	15	L	1%	0.44
		Heating	Improved Roof/Ceiling Insulation	37%	50%	285	5%	20	L	0.005	0.24
		DHW - showers	Low Flow Showerhead	1%	15%	23	1%	10	H	4%	19.21

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Health Care	ROB	DHW	HE Water Heaters	32%	25%	27	25%	15	M	5%	14.75
			Heat Pump Water Heating	3%	5%	26.697	100%	15	L	1%	11.45
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	20.08
		Heating - Boiler	HE Boilers	6%	49%	7	15%	15	M	0.05	7.05
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	3%	5%	3	65%	10	L	1%	18.77
			HE Dishwashers	6%	20%	8	25%	10	M	5%	7.04
		Heating - Furnace	HE Furnaces (<=300kBTU)	13%	45%	8	19%	15	M	0.05	2.27
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	1	50%	10	L	1%	20.08
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.6013	5%	10	L	0.005	6.24
		Fryers	HE (ES) Fryers	0%	0.25	0.6013	15%	10	M	5%	12.75
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	1	7%	10	L	1%	7.99
		Broilers	HE Broilers	1%	40%	1	19%	10	L	0.005	14.18
		DHW - Clotheswa	HE Clothes Washers	5%	20%	8	35%	10	M	5%	11.14
		Griddles	HE Griddles	1%	40%	1	6%	10	L	1%	6.71
		Ovens	HE Ovens	0.008	70%	0.6013	66%	10	M	5%	18.86
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	2%	50%	2	6%	10	M	0.05	2.26
Lodging	NC	DHW	Grey Water Heat Exchanger	20%	8%	6	30%	10	M	0.05	11.07
			HE Water Heaters	24%	35%	5.528	15%	10	H	13%	12.00
			HE Water Heating System Design	31%	5%	5.528	5%	15	M	5%	9.38
		Heating - Furnace	Combination Water Heater/Furnace	8%	1%	2	14%	15	L	1%	2.71
		Heating	Heat Recovery: Air to Air	7%	14%	3	40%	15	M	5%	2.80
			Micro Channel Heat Exchangers	26%	0%	5	5%	15	M	0.05	2.38
			Radiant floor heating	4%	5%	4.7627	12%	15	M	0.05	1.94
			Solar ventilation pre-heat	2%	0%	3	15%	15	L	1%	1.25
		Heating	Improved Roof/Ceiling Insulation	56%	50%	11	4%	20	M	5%	3.07
	Retrofit	DHW	Grey Water Heat Exchanger	20%	8%	314	10%	10	L	1%	1.62
			Heat Trap	31%	35%	314.09	5%	10	M	2%	13.82
			Insulating Blankets	15%	65%	314.09	4%	5	M	0.0156	18.91
			Pipe Insulation	23%	25%	314.09	1%	5	M	0.0156	9.00
			Reduced Temperature Setpoints	0.23	65%	314.09	6%	10	O	3%	19.21
			Timers	31%	40%	314.09	5%	10	O	0.025	13.82
			Water Heater Cycling	0.306	0.4	314.09	0.05	10	O	0.025	13.82
		Pool	Pool Cover	3%	20%	35	60%	10	L	1%	18.32
			TOD Pool Pump Timer	3%	30%	34.899	10%	5	L	0.005	25.68
		Heating - Boiler	Boiler - Automatic Chemical feed	19%	10%	220	15%	15	L	0.005	8.59
			Boiler - Steam System Isolation	9%	0.1	104	0.15	20	L	0.005	4.47
			Boiler - Steam to Hot Water Conversion	5%	0.1	104.24	10%	15	M	2%	10.27
			Boiler Blowdown Heat Exchanger	16%	1%	220	4%	15	L	1%	1.94
			Boiler Controls / Cx and RCx	20%	5%	219.72	15%	15	O	3%	3.40

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Lodging	Retrofit	Heating - Boiler	HE Boilers	11%	49%	219.72	25%	15	M	2%	2.16
			Heating Stack Economizer	16%	10%	219.72	4%	15	M	0.0156	2.50
			Steam Trap Maintenance	9%	55%	104	17%	2	O	3%	1.89
		DHW - faucet	Faucet Aerators	3%	40%	31	2%	5	M	2%	25.20
			Ultrasonic Faucet Control	3%	15%	31.409	3%	10	M	0.0156	15.64
			Low Flow Rinse/Nozzles	1%	45%	31.409	55%	5	H	4%	28.66
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	6%	31.409	65%	15	L	1%	7.07
			Wastewater Reclamation	2%	0.06	31.409	40%	15	L	0.005	4.91
		Vent hoods	HE Ventilation Hoods	1%	15%	14	60%	10	M	2%	9.46
		Heating	Heat Recovery: Air to Air	7%	14%	198	40%	15	M	0.0156	1.38
			Insulate Pipes/Lines	59%	10%	601	3%	5	O	3%	0.80
			Solar ventilation pre-heat	2%	0%	198	15%	15	L	1%	1.25
		Heating	Improved Roof/Ceiling Insulation	52%	50%	601	5%	20	L	0.005	0.58
		DHW - showers	Low Flow Showerhead	1%	15%	31	9%	10	H	4%	19.21
	ROB	DHW	HE Water Heaters	29%	25%	37	25%	15	M	5%	14.75
			Heat Pump Water Heating	3%	5%	36.937	100%	15	L	1%	11.55
		Pool	HE Gas Pool Water Heater	3%	30%	4	25%	10	M	5%	20.08
		Heating - Boiler	HE Boilers	11%	49%	19	15%	15	M	0.05	3.60
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	3%	5%	4	65%	10	L	1%	18.77
			HE Dishwashers	6%	20%	11	25%	10	M	5%	7.04
		Heating - Furnace	HE Furnaces (<=300kBTU)	8%	45%	7	19%	15	M	0.05	2.27
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	1	50%	10	L	1%	20.08
			HE (ES) Steam Cookers / Steamers	0%	0.25	0.5432	5%	10	L	0.005	6.24
		Fryers	HE (ES) Fryers	0%	0.25	0.5432	15%	10	M	5%	12.75
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	1	7%	10	L	1%	7.99
		Broilers	HE Broilers	0%	0.25	1	19%	10	L	0.005	14.18
		DHW - Clotheswa	HE Clothes Washers	5%	20%	11	35%	10	M	5%	11.14
		Griddles	HE Griddles	0%	40%	1	6%	10	L	1%	6.71
		Ovens	HE Ovens	0.005	72%	0.5432	66%	10	M	5%	18.86
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	4%	50%	5	6%	10	M	0.05	2.93
Mercantile	NC	DHW	Grey Water Heat Exchanger	13%	8%	3	5%	10	M	0.05	6.83
			HE Water Heaters	16%	35%	3.2032	15%	10	H	13%	7.57
			HE Water Heating System Design	20%	5%	3.2032	5%	15	M	5%	5.70
		Heating - Furnace	Combination Water Heater/Furnace	17%	1%	4	14%	15	L	1%	4.77
		Heating	Heat Recovery: Air to Air	7%	14%	3	40%	15	M	5%	1.45
			Micro Channel Heat Exchangers	26%	0%	4	5%	15	M	0.05	4.23
			Radiant floor heating	4%	5%	4.1974	12%	15	M	0.05	3.50
			Solar ventilation pre-heat	2%	0%	3	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	55%	50%	9	4%	20	M	5%	1.29

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Mercantile	Retrofit	DHW	Grey Water Heat Exchanger	13%	8%	182	5%	10	L	1%	0.81
			Heat Trap	20%	35%	182	0.05	10	M	2%	9.14
			Insulating Blankets	10%	65%	182	4%	5	M	0.0156	13.60
			Pipe Insulation	15%	25%	182	1%	5	M	0.0156	5.17
			Reduced Temperature Setpoints	0.149	50%	182	6%	10	O	3%	14.82
			Timers	20%	40%	182	5%	10	O	0.025	9.14
			Water Heater Cycling	0.198	0.4	182	0.05	10	O	0.025	9.14
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	13.76
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	22.34
		Heating - Boiler	Boiler - Automatic Chemical feed	5%	10%	55	15%	15	L	0.005	5.07
			Boiler - Steam System Isolation	3%	0.1	26	0.15	20	L	0.005	3.27
			Boiler - Steam to Hot Water Conversion	1%	0.1	25.626	10%	15	M	2%	6.33
			Boiler Blowdown Heat Exchanger	5%	1%	55	4%	15	L	1%	0.98
			Boiler Controls / Cx and RCx	6%	5%	54.912	15%	15	O	3%	1.77
			HE Boilers	3%	49%	54.912	25%	15	M	2%	1.10
			Heating Stack Economizer	5%	10%	54.912	4%	15	M	0.0156	1.28
			Steam Trap Maintenance	3%	30%	26	17%	2	O	3%	5.23
		DHW - faucet	Faucet Aerators	2%	40%	18	2%	5	M	2%	21.60
			Ultrasonic Faucet Control	2%	15%	18.2	3%	10	M	0.0156	10.88
			Low Flow Rinse/Nozzles	1%	45%	18.2	55%	5	H	4%	27.48
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	18.2	65%	15	L	1%	4.04
			Wastewater Reclamation	1%	0.05	18.2	40%	15	L	0.005	2.66
		Vent hoods	HE Ventilation Hoods	2%	15%	21	60%	10	M	2%	5.62
		Heating	Heat Recovery: Air to Air	7%	14%	175	40%	15	M	0.0156	0.38
			Insulate Pipes/Lines	58%	10%	530	3%	5	O	3%	1.52
			Solar ventilation pre-heat	2%	0%	175	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	51%	50%	530	5%	20	L	0.005	0.23
		DHW - showers	Low Flow Showerhead	1%	15%	18	1%	10	H	4%	14.82
	ROB	DHW	HE Water Heaters	19%	25%	21	25%	15	M	5%	10.49
			Heat Pump Water Heating	2%	5%	21.403	100%	15	L	1%	9.02
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	15.91
		Heating - Boiler	HE Boilers	3%	49%	5	15%	15	M	0.05	8.06
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	2	65%	10	L	1%	14.29
			HE Dishwashers	4%	20%	6	25%	10	M	5%	3.95
		Heating - Furnace	HE Furnaces (<=300kBTU)	36%	45%	31	19%	15	M	0.05	4.05
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	1	50%	10	L	1%	15.91
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.8107	5%	10	L	0.005	3.44
		Fryers	HE (ES) Fryers	0%	0.25	0.8107	15%	10	M	5%	8.21
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	2	7%	10	L	1%	4.58
		Broilers	HE Broilers	1%	40%	1	19%	10	L	0.005	13.98
		DHW - Clotheswa	HE Clothes Washers	3%	20%	6	35%	10	M	5%	6.88
		Griddles	HE Griddles	1%	40%	1	6%	10	L	1%	3.74
		Ovens	HE Ovens	0.008	33%	0.8107	66%	10	M	5%	14.39
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	7%	50%	7	6%	10	M	0.05	4.07

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Office	NC	DHW	Grey Water Heat Exchanger	15%	8%	4	10%	10	M	0.05	5.11
			HE Water Heaters	19%	35%	3.8487	15%	10	H	13%	5.71
			HE Water Heating System Design	23%	5%	3.8487	5%	15	M	5%	4.23
		Heating - Furnace	Combination Water Heater/Furnace	17%	1%	4	14%	15	L	1%	3.49
		Heating	Heat Recovery: Air to Air	8%	14%	4	40%	15	M	5%	1.90
			Micro Channel Heat Exchangers	30%	0%	5	5%	15	M	0.05	3.07
			Radiant floor heating	5%	5%	4.9556	12%	15	M	0.05	2.52
			Solar ventilation pre-heat	2%	0%	4	15%	15	L	1%	1.64
		Heating	Improved Roof/Ceiling Insulation	64%	50%	11	4%	20	M	5%	1.13
	Retrofit	DHW	Grey Water Heat Exchanger	15%	8%	219	10%	10	L	1%	0.56
			Heat Trap	23%	35%	218.68	5%	10	M	2%	7.04
			Insulating Blankets	12%	65%	218.68	4%	5	M	0.0156	10.90
			Pipe Insulation	18%	25%	218.68	1%	5	M	0.0156	3.75
			Reduced Temperature Setpoints	0.176	65%	218.68	6%	10	O	3%	12.34
			Timers	23%	40%	218.68	5%	10	O	0.025	7.04
			Water Heater Cycling	0.234	0.4	218.68	0.05	10	O	0.025	7.04
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	11.28
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	20.05
		Heating - Boiler	Boiler - Automatic Chemical feed	13%	10%	130	15%	15	L	0.005	3.72
			Boiler - Steam System Isolation	6%	0.1	62	0.15	20	L	0.005	2.35
			Boiler - Steam to Hot Water Conversion	3%	0.1	62.34	10%	15	M	2%	4.73
			Boiler Blowdown Heat Exchanger	11%	1%	130	4%	15	L	1%	0.68
			Boiler Controls / Cx and RCx	13%	5%	130.26	15%	15	O	3%	2.38
			HE Boilers	7%	49%	130.26	25%	15	M	2%	1.13
			Heating Stack Economizer	11%	10%	130.26	4%	15	M	0.0156	0.89
			Steam Trap Maintenance	7%	30%	62	17%	2	O	3%	3.78
		DHW - faucet	Faucet Aerators	2%	40%	22	1%	5	M	2%	19.19
			Ultrasonic Faucet Control	2%	15%	21.868	3%	10	M	0.0156	8.57
			Low Flow Rinse/Nozzles	1%	45%	21.868	55%	5	H	4%	26.52
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	22	65%	15	L	1%	2.93
			Wastewater Reclamation	2%	0.05	21.868	40%	15	L	0.005	1.90
		Vent hoods	HE Ventilation Hoods	0%	15%	0	60%	10	M	2%	4.13
		Heating	Heat Recovery: Air to Air	8%	14%	206	40%	15	M	0.0156	0.51
			Insulate Pipes/Lines	67%	10%	626	3%	5	O	3%	1.06
			Solar ventilation pre-heat	2%	0%	206	15%	15	L	1%	1.64
		Heating	Improved Roof/Ceiling Insulation	59%	50%	626	5%	20	L	0.005	0.20
		DHW - showers	Low Flow Showerhead	1%	15%	22	1%	10	H	4%	12.34

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Office	ROB	DHW	HE Water Heaters	22%	25%	26	25%	15	M	5%	8.36
			Heat Pump Water Heating	2%	5%	25.717	100%	15	L	1%	7.67
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	13.45
		Heating - Boiler	HE Boilers	7%	49%	11	15%	15	M	0.05	6.17
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	3	65%	10	L	1%	11.81
			HE Dishwashers	5%	75%	8	25%	10	M	5%	2.85
		Heating - Furnace	HE Furnaces (<=300kBTU)	30%	45%	26	19%	15	M	0.05	2.94
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	0	50%	10	L	1%	13.45
			HE (ES) Steam Cookers / Steamers	0	0.25	0	5%	10	L	0.005	2.47
		Fryers	HE (ES) Fryers	0	0.25	0	15%	10	M	5%	6.24
		Cabinets	HE (ES) Hot Food Holding Cabinets	0	0.25	0	7%	10	L	1%	3.33
		Broilers	HE Broilers	0	40%	0	19%	10	L	0.005	11.50
		DHW - Clotheswa	HE Clothes Washers	4%	20%	8	35%	10	M	5%	5.15
		Griddles	HE Griddles	0%	40%	0	6%	10	L	1%	2.69
		Ovens	HE Ovens	0	33%	0	66%	10	M	5%	11.91
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	5%	50%	5	6%	10	M	0.05	2.93
Other (incl. U	NC	DHW	Grey Water Heat Exchanger	17%	8%	1	5%	10	M	0.05	6.83
			HE Water Heaters	21%	35%	1.4779	15%	10	H	13%	7.57
			HE Water Heating System Design	26%	5%	1.4779	5%	15	M	5%	5.70
		Heating - Furnace	Combination Water Heater/Furnace	11%	1%	1	14%	15	L	1%	4.77
		Heating	Heat Recovery: Air to Air	11%	7%	1	40%	15	M	5%	1.46
			Micro Channel Heat Exchangers	20%	0%	1	5%	15	M	0.05	4.23
			Radiant floor heating	3%	5%	1.1374	12%	15	M	0.05	3.50
			Solar ventilation pre-heat	1%	0%	1	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	43%	50%	3	4%	20	M	5%	4.19

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Other (incl. L	Retrofit	DHW	Grey Water Heat Exchanger	17%	8%	84	5%	10	L	1%	0.81
			Heat Trap	26%	35%	83.969	0.05	10	M	2%	9.14
			Insulating Blankets	13%	65%	83.969	4%	5	M	0.0156	13.60
			Pipe Insulation	20%	25%	83.969	1%	5	M	0.0156	5.17
			Reduced Temperature Setpoints	0.196	65%	83.969	6%	10	O	3%	14.82
			Timers	26%	40%	83.969	5%	10	O	0.025	9.14
			Water Heater Cycling	0.261	0.4	83.969	0.05	10	O	0.025	9.14
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	13.76
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	22.34
		Heating - Boiler	Boiler - Automatic Chemical feed	7%	10%	24	15%	15	L	0.005	5.07
			Boiler - Steam System Isolation	3%	0.1	11	0.15	20	L	0.005	3.27
			Boiler - Steam to Hot Water Conversion	2%	0.1	11.211	10%	15	M	2%	6.33
			Boiler Blowdown Heat Exchanger	6%	1%	24	4%	15	L	1%	0.98
			Boiler Controls / Cx and RCx	7%	5%	23.704	15%	15	O	3%	1.77
			HE Boilers	4%	49%	23.704	25%	15	M	2%	1.10
			Heating Stack Economizer	6%	10%	23.704	4%	15	M	0.0156	1.28
			Steam Trap Maintenance	3%	55%	11	17%	2	O	3%	5.23
		DHW - faucet	Faucet Aerators	2%	40%	8	1%	5	M	2%	21.60
			Ultrasonic Faucet Control	3%	5%	8.3969	3%	10	M	0.0156	10.88
			Low Flow Rinse/Nozzles	1%	45%	8.3969	55%	5	H	4%	27.48
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	8.3969	65%	15	L	1%	4.04
			Wastewater Reclamation	2%	0.05	8.3969	40%	15	L	0.005	2.66
		Vent hoods	HE Ventilation Hoods	2%	15%	10	0%	10	M	2%	0.00
		Heating	Heat Recovery: Air to Air	11%	7%	47	40%	15	M	0.0156	0.38
			Insulate Pipes/Lines	45%	10%	144	3%	5	O	3%	1.52
			Solar ventilation pre-heat	1%	0%	47	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	39%	50%	144	5%	20	L	0.005	0.84
		DHW - showers	Low Flow Showerhead	1%	15%	8	1%	10	H	4%	14.82
	ROB	DHW	HE Water Heaters	25%	25%	10	25%	15	M	5%	10.49
			Heat Pump Water Heating	3%	5%	9.8748	100%	15	L	1%	9.07
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	15.91
		Heating - Boiler	HE Boilers	4%	49%	2	15%	15	M	0.05	8.06
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	1	65%	10	L	1%	14.29
			HE Dishwashers	5%	20%	3	25%	10	M	5%	3.95
		Heating - Furnace	HE Furnaces (<=300kBTU)	18%	45%	5	19%	15	M	0.05	4.05
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	0	50%	10	L	1%	15.91
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.3783	0%	10	L	0.005	0.00
		Fryers	HE (ES) Fryers	1%	0.25	0.3783	0	10	M	5%	0.00
		Cabinets	HE (ES) Hot Food Holding Cabinets	2%	0.25	1	0	10	L	1%	0.00
		Broilers	HE Broilers	1%	0.25	0	19%	10	L	0.005	13.98
		DHW - Clotheswa	HE Clothes Washers	4%	20%	3	35%	10	M	5%	6.88
		Griddles	HE Griddles	1%	40%	0	6%	10	L	1%	3.74
		Ovens	HE Ovens	0.01	20%	0.3783	66%	10	M	5%	14.39
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	6%	50%	2	6%	10	M	0.05	4.07

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Public Asser	NC	DHW	Grey Water Heat Exchanger	14%	8%	2	5%	10	M	0.05	4.72
			HE Water Heaters	17%	35%	1.9802	15%	10	H	13%	5.30
			HE Water Heating System Design	22%	5%	1.9802	5%	15	M	5%	3.91
		Heating - Furnace	Combination Water Heater/Furnace	15%	1%	2	14%	15	L	1%	3.21
		Heating	Heat Recovery: Air to Air	14%	14%	2	40%	15	M	5%	4.60
			Micro Channel Heat Exchangers	25%	0%	2	5%	15	M	0.05	2.82
			Radiant floor heating	4%	5%	2.3018	12%	15	M	0.05	2.31
			Solar ventilation pre-heat	2%	0%	2	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	53%	50%	5	4%	20	M	5%	1.75
	Retrofit	DHW	Grey Water Heat Exchanger	14%	8%	113	5%	10	L	1%	0.51
			Heat Trap	22%	35%	112.51	0.05	10	M	2%	6.56
			Insulating Blankets	11%	65%	112.51	4%	5	M	0.0156	10.25
			Pipe Insulation	16%	25%	112.51	1%	5	M	0.0156	3.45
			Reduced Temperature Setpoints	0.162	50%	112.51	6%	10	O	3%	11.71
			Timers	22%	40%	112.51	5%	10	O	0.025	6.56
			Water Heater Cycling	0.216	0.4	112.51	0.05	10	O	0.025	6.56
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	10.67
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	19.41
		Heating - Boiler	Boiler - Automatic Chemical feed	9%	10%	49	15%	15	L	0.005	3.43
			Boiler - Steam System Isolation	4%	0.1	23	0.15	20	L	0.005	2.16
			Boiler - Steam to Hot Water Conversion	2%	0.1	23.338	10%	15	M	2%	4.37
			Boiler Blowdown Heat Exchanger	7%	1%	49	4%	15	L	1%	0.62
			Boiler Controls / Cx and RCx	9%	5%	49.268	15%	15	O	3%	2.18
			HE Boilers	5%	49%	49.268	25%	15	H	4%	1.13
			Heating Stack Economizer	7%	10%	49.268	4%	15	M	2%	0.81
			Steam Trap Maintenance	5%	30%	23	17%	2	O	3%	3.48
		DHW - faucet	Faucet Aerators	2%	40%	11	1%	5	M	2%	18.53
			Ultrasonic Faucet Control	2%	15%	11.251	3%	10	M	0.0156	8.03
			Low Flow Rinse/Nozzles	1%	45%	11.251	55%	5	H	4%	26.22
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	11.251	65%	15	L	1%	2.70
			Wastewater Reclamation	2%	0.05	11.251	40%	15	L	0.005	1.74
		Vent hoods	HE Ventilation Hoods	1%	15%	10	60%	10	M	2%	3.81
		Heating	Heat Recovery: Air to Air	14%	14%	96	40%	15	M	0.0156	1.36
			Insulate Pipes/Lines	56%	10%	291	3%	5	O	3%	0.97
			Solar ventilation pre-heat	2%	0%	96	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	49%	50%	291	5%	20	L	0.005	0.31
		DHW - showers	Low Flow Showerhead	1%	15%	11	1%	10	H	4%	11.71

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Public Asser	ROB	DHW	HE Water Heaters	21%	25%	13	25%	15	M	5%	7.85
			Heat Pump Water Heating	2%	5%	13.231	100%	15	L	1%	7.35
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	12.82
		Heating - Boiler	HE Boilers	5%	49%	4	15%	15	M	0.05	5.74
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	1	0%	10	L	1%	0.00
			HE Dishwashers	4%	20%	4	25%	10	M	5%	2.62
		Heating - Furnace	HE Furnaces (<=300kBTU)	28%	45%	13	19%	15	M	0.05	2.70
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	0	0%	10	L	1%	0.00
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.3982	5%	10	L	0.005	2.26
		Fryers	HE (ES) Fryers	0%	0.25	0.3982	15%	10	M	5%	5.80
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	1	7%	10	L	1%	3.06
		Broilers	HE Broilers	1%	40%	0	19%	10	L	0.005	10.88
		DHW - Clotheswa	HE Clothes Washers	3%	20%	4	35%	10	M	5%	4.76
		Griddles	HE Griddles	1%	40%	0	6%	10	L	1%	2.47
		Ovens	HE Ovens	0.007	33%	0.3982	0%	10	M	5%	0.00
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	5%	50%	3	6%	10	M	0.05	2.69
Public Order	NC	DHW	Grey Water Heat Exchanger	17%	8%	0	5%	10	M	0.05	4.37
			HE Water Heaters	21%	35%	0.4926	15%	10	H	13%	9.14
			HE Water Heating System Design	26%	5%	0.4926	5%	15	M	5%	3.91
		Heating - Furnace	Combination Water Heater/Furnace	12%	1%	0	14%	15	L	1%	3.21
		Heating	Heat Recovery: Air to Air	11%	14%	0	40%	15	M	5%	4.60
			Micro Channel Heat Exchangers	20%	0%	0	5%	15	M	0.05	2.82
			Radiant floor heating	3%	5%	0.3791	12%	15	M	0.05	2.31
			Solar ventilation pre-heat	1%	0%	0	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	43%	50%	1	4%	20	M	5%	4.34
	Retrofit	DHW	Grey Water Heat Exchanger	17%	8%	28	5%	10	L	1%	0.51
			Heat Trap	26%	35%	27.99	0.05	10	M	2%	6.56
			Insulating Blankets	13%	65%	27.99	4%	5	M	0.0156	10.25
			Pipe Insulation	20%	25%	27.99	1%	5	M	0.0156	3.45
			Reduced Temperature Setpoints	0.196	50%	27.99	6%	10	O	3%	11.71
			Timers	26%	40%	27.99	5%	10	O	0.025	6.56
			Water Heater Cycling	0.261	0.4	27.99	0.05	10	O	0.025	6.56
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	10.67
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	19.41
		Heating - Boiler	Boiler - Automatic Chemical feed	7%	10%	8	15%	15	L	0.005	3.43
			Boiler - Steam System Isolation	3%	0.1	4	0.15	20	L	0.005	2.16
			Boiler - Steam to Hot Water Conversion	2%	0.1	3.8438	10%	15	M	2%	8.65
			Boiler Blowdown Heat Exchanger	6%	1%	8	4%	15	L	1%	0.62
			Boiler Controls / Cx and RCx	7%	5%	8.1147	15%	15	O	3%	2.18
			HE Boilers	4%	49%	8.1147	25%	15	H	4%	1.13
			Heating Stack Economizer	6%	10%	8.1147	4%	15	M	2%	0.81
			Steam Trap Maintenance	3%	55%	4	17%	2	O	3%	3.48
		DHW - faucet	Faucet Aerators	2%	40%	3	1%	5	M	2%	18.53
			Ultrasonic Faucet Control	3%	15%	2.799	3%	10	M	0.0156	8.03
			Low Flow Rinse/Nozzles	1%	45%	2.799	55%	5	H	4%	26.22
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	2.799	65%	15	L	1%	2.70
			Wastewater Reclamation	2%	0.05	2.799	40%	15	L	0.005	1.74

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Public Order	Retrofit	Vent hoods	HE Ventilation Hoods	2%	15%	3	60%	10	M	2%	3.81
		Heating	Heat Recovery: Air to Air	11%	14%	16	40%	15	M	0.0156	0.51
			Insulate Pipes/Lines	45%	10%	48	3%	5	O	3%	0.97
			Solar ventilation pre-heat	1%	0%	16	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	39%	50%	48	5%	20	L	0.005	0.87
		DHW - showers	Low Flow Showerhead	1%	15%	3	1%	10	H	4%	11.71
	ROB	DHW	HE Water Heaters	25%	25%	3	25%	15	M	5%	10.49
			Heat Pump Water Heating	3%	5%	3.2916	100%	15	L	1%	5.44
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	7.21
		Heating - Boiler	HE Boilers	4%	49%	1	15%	15	M	0.05	4.15
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	0	0%	10	L	1%	0.00
			HE Dishwashers	5%	20%	1	25%	10	M	5%	2.62
		Heating - Furnace	HE Furnaces (<=300kBTU)	22%	45%	2	19%	15	M	0.05	2.70
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	0	0%	10	L	1%	0.00
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.1261	5%	10	L	0.005	12.82
		Fryers	HE (ES) Fryers	1%	0.25	0.1261	15%	10	M	5%	5.80
		Cabinets	HE (ES) Hot Food Holding Cabinets	2%	0.25	0	7%	10	L	1%	14.03
		Broilers	HE Broilers	1%	40%	0	19%	10	L	0.005	10.88
		DHW - Clotheswa	HE Clothes Washers	4%	20%	1	35%	10	M	5%	4.76
		Griddles	HE Griddles	1%	40%	0	6%	10	L	1%	2.47
		Ovens	HE Ovens	0.01	33%	0.1261	0%	10	M	5%	0.00
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	4%	50%	1	6%	10	M	0.05	2.69
Religious W	NC	DHW	Grey Water Heat Exchanger	14%	8%	2	5%	10	M	0.05	4.37
			HE Water Heaters	17%	35%	1.6599	15%	10	H	13%	9.14
			HE Water Heating System Design	22%	5%	1.6599	5%	15	M	5%	3.91
		Heating - Furnace	Combination Water Heater/Furnace	15%	1%	2	14%	15	L	1%	3.21
		Heating	Heat Recovery: Air to Air	14%	14%	1	40%	15	M	5%	4.60
			Micro Channel Heat Exchangers	25%	0%	2	5%	15	M	0.05	2.82
			Radiant floor heating	4%	5%	1.9294	12%	15	M	0.05	2.31
			Solar ventilation pre-heat	2%	0%	1	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	53%	50%	4	4%	20	M	5%	4.34
	Retrofit	DHW	Grey Water Heat Exchanger	14%	8%	94	5%	10	L	1%	0.51
			Heat Trap	22%	35%	94.31	0.05	10	M	2%	6.56
			Insulating Blankets	11%	65%	94.31	4%	5	M	0.0156	10.25
			Pipe Insulation	16%	25%	94.31	1%	5	M	0.0156	3.45
			Reduced Temperature Setpoints	0.162	50%	94.31	6%	10	O	3%	11.71
			Timers	22%	40%	94.31	5%	10	O	0.025	6.56
			Water Heater Cycling	0.216	0.4	94.31	0.05	10	O	0.025	6.56
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	10.67
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	19.41
		Heating - Boiler	Boiler - Automatic Chemical feed	9%	10%	41	15%	15	L	0.005	3.43
			Boiler - Steam System Isolation	4%	0.1	20	0.15	20	L	0.005	2.16
			Boiler - Steam to Hot Water Conversion	2%	0.1	19.562	10%	15	M	2%	8.65
			Boiler Blowdown Heat Exchanger	7%	1%	41	4%	15	L	1%	0.62
			Boiler Controls / Cx and RCx	9%	5%	41.298	15%	15	O	3%	2.18

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Religious W	Retrofit	Heating - Boiler	HE Boilers	5%	49%	41.298	25%	15	M	2%	1.13
			Heating Stack Economizer	7%	10%	41.298	4%	15	M	0.0156	0.81
			Steam Trap Maintenance	5%	30%	20	17%	2	O	3%	3.48
		DHW - faucet	Faucet Aerators	2%	40%	9	1%	5	M	2%	18.53
			Ultrasonic Faucet Control	2%	15%	9.431	3%	10	M	0.0156	8.03
			Low Flow Rinse/Nozzles	1%	45%	9.431	55%	5	H	4%	26.22
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	9.431	65%	15	L	1%	2.70
			Wastewater Reclamation	2%	0.05	9.431	40%	15	L	0.005	1.74
		Vent hoods	HE Ventilation Hoods	1%	15%	6	0%	10	M	2%	0.00
		Heating	Heat Recovery: Air to Air	14%	14%	80	40%	15	M	0.0156	0.46
			Insulate Pipes/Lines	56%	10%	244	3%	5	O	3%	0.97
			Solar ventilation pre-heat	2%	0%	80	15%	15	L	1%	1.50
		Heating	Improved Roof/Ceiling Insulation	49%	50%	244	5%	20	L	0.005	0.87
		DHW - showers	Low Flow Showerhead	1%	15%	9	1%	10	H	4%	11.71
	ROB	DHW	HE Water Heaters	21%	25%	11	25%	15	M	5%	10.49
			Heat Pump Water Heating	2%	5%	11.091	100%	15	L	1%	5.44
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	7.21
		Heating - Boiler	HE Boilers	5%	49%	3	15%	15	M	0.05	4.15
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	1	0%	10	L	1%	0.00
			HE Dishwashers	4%	20%	3	25%	10	M	5%	2.62
		Heating - Furnace	HE Furnaces (<=300kBTU)	28%	45%	11	19%	15	M	0.05	2.70
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	0	0%	10	L	1%	0.00
			HE (ES) Steam Cookers / Steamers	0%	0.25	0.2311	0	10	L	0.005	0.00
		Fryers	HE (ES) Fryers	0%	0.25	0.2311	0	10	M	5%	0.00
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	0	0	10	L	1%	0.00
		Broilers	HE Broilers	0%	40%	0	19%	10	L	0.005	10.88
		DHW - Clotheswa	HE Clothes Washers	3%	20%	3	35%	10	M	5%	4.76
		Griddles	HE Griddles	0%	40%	0	6%	10	L	1%	2.47
		Ovens	HE Ovens	0.005	33%	0.2311	0%	10	M	5%	0.00
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	5%	50%	3	6%	10	M	0.05	2.69
Service (ligh	NC	DHW	Grey Water Heat Exchanger	17%	8%	3	5%	10	M	0.05	6.83
			HE Water Heaters	21%	35%	2.639	15%	10	H	13%	7.57
			HE Water Heating System Design	26%	5%	2.639	5%	15	M	5%	5.70
		Heating - Furnace	Combination Water Heater/Furnace	12%	1%	2	14%	15	L	1%	4.77
		Heating	Heat Recovery: Air to Air	11%	14%	1	40%	15	M	5%	1.46
			Micro Channel Heat Exchangers	20%	0%	2	5%	15	M	0.05	4.23
			Radiant floor heating	3%	5%	2.031	12%	15	M	0.05	3.50
			Solar ventilation pre-heat	1%	0%	1	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	43%	50%	5	4%	20	M	5%	2.67

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Service (ligh	Retrofit	DHW	Grey Water Heat Exchanger	17%	8%	150	5%	10	L	1%	0.81
			Heat Trap	26%	35%	149.94	0.05	10	M	2%	9.14
			Insulating Blankets	13%	65%	149.94	4%	5	M	0.0156	13.60
			Pipe Insulation	20%	25%	149.94	1%	5	M	0.0156	5.17
			Reduced Temperature Setpoints	0.196	50%	149.94	6%	10	O	3%	14.82
			Timers	26%	40%	149.94	5%	10	O	0.025	9.14
			Water Heater Cycling	0.261	0.4	149.94	0.05	10	O	0.025	9.14
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	13.76
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	22.34
		Heating - Boiler	Boiler - Automatic Chemical feed	7%	10%	43	15%	15	L	0.005	5.07
			Boiler - Steam System Isolation	3%	0.1	21	0.15	20	L	0.005	3.27
			Boiler - Steam to Hot Water Conversion	2%	0.1	20.592	10%	15	M	2%	6.33
			Boiler Blowdown Heat Exchanger	6%	1%	43	4%	15	L	1%	0.98
			Boiler Controls / Cx and RCx	7%	5%	43.472	15%	15	O	3%	1.77
			HE Boilers	4%	49%	43.472	25%	15	M	2%	1.10
			Heating Stack Economizer	6%	10%	43.472	4%	15	M	0.0156	1.28
			Steam Trap Maintenance	4%	30%	21	17%	2	O	3%	5.23
		DHW - faucet	Faucet Aerators	2%	40%	15	1%	5	M	2%	21.60
			Ultrasonic Faucet Control	3%	15%	14.994	3%	10	M	0.0156	10.88
			Low Flow Rinse/Nozzles	1%	45%	14.994	55%	5	H	4%	27.48
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	14.994	65%	15	L	1%	4.04
			Wastewater Reclamation	2%	0.05	14.994	40%	15	L	0.005	2.66
		Vent hoods	HE Ventilation Hoods	2%	15%	13	0%	10	M	2%	0.00
		Heating	Heat Recovery: Air to Air	11%	14%	85	40%	15	M	0.0156	0.38
			Insulate Pipes/Lines	45%	10%	256	3%	5	O	3%	1.52
			Solar ventilation pre-heat	1%	0%	85	15%	15	L	1%	2.31
		Heating	Improved Roof/Ceiling Insulation	39%	50%	256	5%	20	L	0.005	0.50
		DHW - showers	Low Flow Showerhead	1%	15%	15	1%	10	H	4%	14.82
	ROB	DHW	HE Water Heaters	25%	25%	18	25%	15	M	5%	10.49
			Heat Pump Water Heating	3%	5%	17.633	100%	15	L	1%	9.07
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	15.91
		Heating - Boiler	HE Boilers	4%	49%	4	15%	15	M	0.05	8.06
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	2%	5%	2	0%	10	L	1%	0.00
			HE Dishwashers	5%	20%	5	25%	10	M	5%	3.95
		Heating - Furnace	HE Furnaces (<=300kBTU)	22%	45%	12	19%	15	M	0.05	4.05
		Steamers	Connectionless (Boilerless) Steamers	1%	25%	1	0%	10	L	1%	0.00
			HE (ES) Steam Cookers / Steamers	1%	0.25	0.5067	0	10	L	0.005	0.00
		Fryers	HE (ES) Fryers	0%	0.25	0.5067	0	10	M	5%	0.00
		Cabinets	HE (ES) Hot Food Holding Cabinets	1%	0.25	1	0	10	L	1%	0.00
		Broilers	HE Broilers	1%	40%	1	19%	10	L	0.005	13.98
		DHW - Clotheswa	HE Clothes Washers	4%	20%	5	35%	10	M	5%	6.88
		Griddles	HE Griddles	1%	40%	1	6%	10	L	1%	3.74
		Ovens	HE Ovens	0.008	33%	0.5067	0%	10	M	5%	0.00
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	4%	50%	3	6%	10	M	0.05	4.07

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	NC	DHW	Grey Water Heat Exchanger	11%	8%	1	5%	10	M	0.05	5.11
			HE Water Heaters	13%	35%	1.4237	15%	10	H	13%	5.71
			HE Water Heating System Design	16%	5%	1.4237	5%	15	M	5%	4.23
		Heating - Furnace	Combination Water Heater/Furnace	21%	1%	2	14%	15	L	1%	3.49
		Heating	Heat Recovery: Air to Air	18%	7%	2	40%	15	M	5%	1.94
			Micro Channel Heat Exchangers	32%	0%	3	5%	15	M	0.05	3.07
			Radiant floor heating	5%	5%	2.8298	12%	15	M	0.05	2.52
			Solar ventilation pre-heat	2%	0%	2	15%	15	L	1%	1.64
		Heating	Improved Roof/Ceiling Insulation	67%	50%	6	4%	20	M	5%	0.98
	Retrofit	DHW	Grey Water Heat Exchanger	11%	8%	81	5%	10	L	1%	0.56
			Heat Trap	16%	35%	80.89	0.05	10	M	2%	7.04
			Insulating Blankets	8%	65%	80.89	4%	5	M	0.0156	10.90
			Pipe Insulation	12%	25%	80.89	1%	5	M	0.0156	3.75
			Reduced Temperature Setpoints	0.12	50%	80.89	6%	10	O	3%	12.34
			Timers	16%	40%	80.89	5%	10	O	0.025	7.04
			Water Heater Cycling	0.16	0.4	80.89	0.05	10	O	0.025	7.04
		Pool	Pool Cover	0%	10%	0	60%	10	L	1%	11.28
			TOD Pool Pump Timer	0	30%	0	10%	5	L	0.005	20.05
		Heating - Boiler	Boiler - Automatic Chemical feed	5%	10%	27	15%	15	L	0.005	3.72
			Boiler - Steam System Isolation	2%	0.1	13	0.15	20	L	0.005	2.35
			Boiler - Steam to Hot Water Conversion	1%	0.1	13.087	10%	15	M	2%	4.73
			Boiler Blowdown Heat Exchanger	4%	1%	27	4%	15	L	1%	0.68
			Boiler Controls / Cx and RCx	5%	5%	27.181	15%	15	O	3%	2.38
			HE Boilers	3%	49%	27.181	25%	15	M	2%	1.13
			Heating Stack Economizer	4%	10%	27.181	4%	15	M	0.0156	0.89
			Steam Trap Maintenance	3%	30%	13	17%	2	O	3%	3.78
		DHW - faucet	Faucet Aerators	2%	40%	8	1%	5	M	2%	19.19
			Ultrasonic Faucet Control	2%	5%	8.089	3%	10	M	0.0156	8.57
			Low Flow Rinse/Nozzles	1%	45%	8.089	55%	5	H	4%	26.52
		DHW - Clotheswa	Ozone Commercial Laundry System (Gas HW)	1%	5%	8.089	65%	15	L	1%	2.93
			Wastewater Reclamation	1%	0.05	8.089	40%	15	L	0.005	1.90
		Vent hoods	HE Ventilation Hoods	0%	15%	2	0%	10	M	2%	0.00
		Heating	Heat Recovery: Air to Air	18%	7%	118	40%	15	M	0.0156	0.52
			Insulate Pipes/Lines	71%	20%	357	3%	5	O	3%	1.06
			Solar ventilation pre-heat	2%	0%	118	15%	15	L	1%	1.64
		Heating	Improved Roof/Ceiling Insulation	62%	50%	357	5%	20	L	0.005	0.17
		DHW - showers	Low Flow Showerhead	1%	15%	8	0%	10	H	4%	0.00

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Warehouse	ROB	DHW	HE Water Heaters	15%	25%	10	25%	15	M	5%	8.36
			Heat Pump Water Heating	2%	5%	9.5126	100%	15	L	1%	7.40
		Pool	HE Gas Pool Water Heater	0%	30%	0	25%	10	M	5%	13.45
		Heating - Boiler	HE Boilers	3%	49%	2	15%	15	M	0.05	6.17
		DHW - Dishwashi	Chemical Sanitizing (Low Temp) Dishwashing Machine (ES)	1%	5%	1	65%	10	L	1%	11.81
			HE Dishwashers	3%	20%	3	25%	10	M	5%	2.85
		Heating - Furnace	HE Furnaces (<=300kBTU)	43%	45%	20	19%	15	M	0.05	2.94
		Steamers	Connectionless (Boilerless) Steamers	0%	25%	0	50%	10	L	1%	13.45
			HE (ES) Steam Cookers / Steamers	0%	0.25	0.0892	0%	10	L	0.005	0.00
		Fryers	HE (ES) Fryers	0%	0.25	0.0892	0	10	M	5%	0.00
		Cabinets	HE (ES) Hot Food Holding Cabinets	0%	0.25	0	0	10	L	1%	0.00
		Broilers	HE Broilers	0%	40%	0	19%	10	L	0.005	11.50
		DHW - Clotheswa	HE Clothes Washers	2%	20%	3	35%	10	M	5%	5.15
		Griddles	HE Griddles	0%	40%	0	6%	10	L	1%	2.69
		Ovens	HE Ovens	0.002	33%	0.0892	66%	10	M	5%	11.91
		Heating - Unit Hea	HE Unit Heaters and Radiant heaters	11%	50%	6	6%	10	M	0.05	2.93

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	NC	HVAC	Air Sealing	5%	5%	0.288	17%	15	0.0001235	L	0.5%	0.18
			Cool Roofs And Exterior Walls	6%	2%	0.361	12%	15	0.0001235	L	0.5%	0.06
			HE (ES) Building Design	6%	2%	0.361	30%	15	0.0001235	L	0.5%	0.70
			HE (ES) Windows And Skylights	3%	5%	0.180	19%	15	0.0001235	L	0.5%	0.15
			HVAC System Commissioning	6%	0%	0.361	10%	5	0.0001235	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.142	12%	15	0.0001235	M	5.0%	3.00
		Lighting	Efficient Lighting Design/Layout	4%	40%	0.209	37%	11	0.0001235	H	12.5%	1.24
			Exterior Light Timers	1%	85%	0.049	30%	15	0.0001235	M	5.0%	6.11
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	0.172	40%	25	0.0001235	H	12.5%	1.82
			Replace Exterior HID with Induction Lighting	0%	2%	0.003	43%	15	0.0001235	L	0.5%	1.69
			Replace Exterior HID with LED Lighting	0%	2%	0.003	60%	15	0.0001235	O	1.8%	1.79
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.051	10%	15	0.0001235	M	5.0%	1.93
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.051	22%	15	0.0001235	H	12.5%	7.30
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.003	10%	15	0.0001235	M	5.0%	1.93
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.003	10%	15	0.0001235	M	5.0%	1.93
			Replace T12 with HP T8/T5	3%	25%	0.166	49%	15	0.0001235	M	5.0%	5.41
	Retrofit	Air Compression	Advanced Air Compression Controls	0%	30%	0.000	4%	15	0.0001235	O	3.5%	0.89
			Advanced Lubricants	0%	5%	0.000	3%	1	0.0001235	L	0.5%	3.48
			Air Compressor System Management	0%	25%	0.000	20%	2	0.0001235	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.000	50%	15	0.0001235	L	0.5%	6.66
			Compressed Air Storage Tank	0%	50%	0.000	2%	15	0.0001235	L	0.5%	8.00
			Compressed Air System Design/Control	0%	80%	0.000	20%	15	0.0001235	L	0.5%	2.22
			Compressed Air System Isolation	0%	20%	0.000	2%	15	0.0001235	O	6.0%	0.89
			Compressed Air System Leak Repair	0%	50%	0.000	10%	2	0.0001235	O	2.0%	2.98
			Cooler Ambient Temperature (-11 Of)	0%	5%	0.000	1%	20	0.0001235	L	0.5%	7.20
			Cycling Air Dryer	0%	25%	0.000	50%	10	0.0001235	L	0.5%	2.35
			Duct In Outside Air To Compressor	0%	10%	0.000	2%	20	0.0001235	L	0.5%	7.20
			Electric Supply System Improvements	0%	10%	0.000	3%	5	0.0001235	M	1.6%	3.85
			Eliminating Wasteful Uses	0%	50%	0.000	1%	5	0.0001235	O	3.0%	2.78
			Night Shut Off For Compressor	0%	50%	0.000	10%	10	0.0001235	M	1.6%	11.16
			Oil Temperature Control	0%	33%	0.000	2%	10	0.0001235	M	1.6%	0.99
			Process - Swap CA Tools For Electric Ones	0%	70%	0.000	50%	10	0.0001235	L	0.5%	8.92
			Reduce Operating Pressure Of Compressed Air System	0%	50%	0.000	3%	20	0.0001235	O	2.0%	9.00
			Regular Maintenance	0%	50%	0.000	5%	1	0.0001235	O	2.0%	0.37
			Regulated Compressed Air Nozzles	0%	50%	0.000	2%	15	0.0001235	L	0.5%	8.00
			Vacuum Leak Repair	0%	5%	0.000	2%	2	0.0001235	O	2.0%	2.98
			Vacuum System Isolation	0%	5%	0.000	2%	5	0.0001235	O	3.0%	2.78
			VSD For Air Compressor Motors	0%	30%	0.000	10%	15	0.0001235	O	3.0%	2.35

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	6%	50%	19.705	15%	2	0.0001235	M	1.6%	4.25
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	3.153	20%	10	0.0001235	M	1.6%	2.00
			Cool Roofs And Exterior Walls	6%	2%	19.705	12%	15	0.0001235	L	0.5%	0.06
			Energy Management System	6%	10%	19.705	10%	5	0.0001235	M	1.6%	0.82
			HE (ES) Windows And Skylights	3%	5%	9.852	19%	15	0.0001235	L	0.5%	0.15
			HVAC System By-Pass Timer	6%	50%	19.705	5%	5	0.0001235	L	0.5%	2.71
			HVAC System Retrocommissioning*	6%	0%	19.705	10%	5	0.0001235	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	6%	20%	19.705	10%	5	0.0001235	L	0.5%	0.08
			Improve Duct Sealing	6%	15%	19.705	7%	10	0.0001235	M	1.6%	4.17
			Insulate Pipes/Lines	6%	80%	19.705	3%	5	0.0001235	M	1.6%	4.68
			Programmable Thermostat	6%	50%	19.705	4%	5	0.0001235	L	0.5%	6.86
			Thermostat Calibration	6%	10%	19.705	5%	5	0.0001235	L	0.5%	6.86
			Time Clock	6%	10%	19.705	4%	5	0.0001235	L	0.5%	6.86
			Ventilation Controls Installed	5%	5%	15.764	15%	5	0.0001235	L	0.5%	10.50
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	1.970	30%	10	0.0001235	O	3.0%	0.66
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	2.913	30%	15	0.0001235	M	1.6%	5.32
			Chilled Water Reset, Optimizer For Chiller(S)	3%	25%	7.767	5%	15	0.0001235	M	1.6%	0.22
			Chiller Optimization Controls	3%	25%	7.767	5%	15	0.0001235	M	1.6%	1.25
			Chiller, Early Retirement	3%	5%	7.767	5%	15	0.0001235	L	0.5%	0.23
			Cooling Tower Optimization	0%	25%	0.971	5%	5	0.0001235	M	1.6%	0.27
			Economizer (Hydronic Or Outside Air)	1%	2%	1.942	20%	10	0.0001235	M	1.6%	2.12
			Electric Supply System Improvements	3%	10%	7.767	3%	5	0.0001235	L	0.5%	3.96
			Motor System Optimization (Incl. Resizing and Asd)	2%	5%	7.282	6%	10	0.0001235	O	3.0%	0.66
			Ultraviolet A/C Coil Cleaning System	1%	25%	1.942	4%	2	0.0001235	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	4%	40%	11.432	37%	11	0.0001235	M	1.6%	1.24
			Exterior Light Timers	1%	85%	2.690	30%	15	0.0001235	M	1.6%	6.11
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	9.414	40%	25	0.0001235	M	1.6%	1.82
			Replace Exterior HID with Induction Lighting	0%	2%	0.155	43%	15	0.0001235	L	0.5%	0.84
			Replace Exterior HID with LED Lighting	0%	2%	0.155	60%	15	0.0001235	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	0%	50%	2.784	10%	15	0.0001235	O	1.3%	0.55
			Replace High Bay HID with T8 (70% conv)	1%	20%	2.784	22%	15	0.0001235	O	6.0%	3.38
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.155	10%	15	0.0001235	O	1.3%	0.55
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.155	22%	15	0.0001235	O	6.0%	3.38
			Replace T12 with HP T8/T5	3%	25%	9.078	49%	15	0.0001235	O	4.0%	1.71
		Motors	Advanced Lubricants and Drivetrain Maintenance	13%	5%	41.292	3%	1	0.0001235	M	1.6%	9.28
			Fan System Efficiency Improvements	10%	10%	32.315	6%	10	0.0001235	M	1.6%	3.43
			Improved Process Scheduling and Deenergizing Idle Machi	58%	25%	179.530	3%	5	0.0001235	L	0.5%	7.15
			Improved Sensors And Process Controls	17%	40%	53.859	3%	10	0.0001235	M	1.6%	1.04
			Low-Load and Soft Start Technologies (Nola Controllers)	6%	25%	179.530	2%	10	0.0001235	O	1.3%	2.79
			Motor Early Retirement	6%	60%	17.953	5%	10	0.0001235	M	1.6%	3.43
			Motor Optimization / Variable Speed Drives (Process Fans,	22%	60%	68.222	30%	15	0.0001235	O	3.0%	2.86
			Process Rework and Scrap Reduction	58%	25%	179.530	3%	5	0.0001235	L	0.5%	7.15
			Pump System Efficiency Improvements	23%	10%	71.812	16%	10	0.0001235	M	1.6%	3.43
			Trim Existing Pump Impeller To More Closely Match Syster	12%	25%	35.906	2%	5	0.0001235	O	1.5%	0.82
			Use of Energy Efficient Belts and Other Improved Mechanis	15%	40%	179.530	3%	2	0.0001235	O	1.3%	2.89

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	Retrofit	Other	Advanced Lubricants	4%	5%	13.812	2%	1	0.0001235	M	1.6%	3.39
			Electric Supply System Improvements	19%	10%	60.052	3%	5	0.0001235	M	1.6%	3.75
		Process Cooling	Advanced Lubricants	1%	5%	3.021	3%	1	0.0001235	H	3.8%	3.48
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001235	M	1.6%	2.00
			Ambient Sub-Cooling - Install Oversized Condenser Or Larg	3%	50%	7.882	5%	10	0.0001235	M	1.6%	0.40
			Chiller Temperature Reset	8%	50%	26.273	1%	1	0.0001235	M	1.6%	1.02
			Condensate Evaporator	3%	10%	9.852	5%	10	0.0001235	M	1.6%	1.24
			Defrost Control System	4%	25%	13.136	3%	10	0.0001235	M	1.6%	2.79
			Desuperheaters	2%	10%	6.568	5%	10	0.0001235	M	1.6%	4.46
			Economizer For Walk-In Coolers	0%	10%	1.314	10%	10	0.0001235	M	1.6%	0.97
			Electric Supply System Improvements	8%	10%	26.273	3%	5	0.0001235	M	1.6%	3.85
			Evaporate Pre-Cooler	2%	10%	6.568	5%	10	0.0001235	M	1.6%	0.20
			Evaporator Fan Controller	2%	10%	6.568	1%	10	0.0001235	M	1.6%	2.79
			Floating Head Pressure Control	4%	50%	13.136	5%	10	0.0001235	M	1.6%	1.94
			Improved Sensors And Process Controls	3%	40%	7.882	3%	10	0.0001235	M	1.6%	1.49
			Insulated Suction Lines	4%	50%	13.136	1%	5	0.0001235	H	3.8%	0.82
			Liquid Pressure Amplifiers	4%	10%	13.136	5%	5	0.0001235	M	1.6%	1.52
			Refrigeration System Maintenance	8%	25%	26.273	5%	3	0.0001235	M	1.6%	4.64
			Repair Refrigerator/Freezer Leaks	8%	50%	26.273	10%	3	0.0001235	M	1.6%	4.64
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	1%	0%	2.627	7%	15	0.0001235	M	1.6%	3.08
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	1%	0%	2.627	4%	15	0.0001235	M	1.6%	2.00
			VSD On Refrigeration Circulating Pump	4%	30%	13.136	30%	15	0.0001235	O	3.0%	2.35
			VSD On Refrigeration Fan	4%	30%	13.136	30%	15	0.0001235	O	3.0%	2.35
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps /	0%	35%	0.413	2%	15	0.0001235	O	3.0%	0.57
			Heat Containment Improvements	1%	70%	2.580	5%	10	0.0001235	M	1.6%	7.20
			Heat Recovery Improvements	3%	70%	10.321	5%	10	0.0001235	M	1.6%	1.01
			Heat Transfer Improvements	1%	70%	2.580	5%	10	0.0001235	M	1.6%	1.01
			Improved Sensors And Process Controls	3%	70%	10.321	8%	10	0.0001235	M	1.6%	1.01
			Load Management (Process Changes)	3%	25%	10.321	2%	10	0.0001235	M	1.6%	3.43
			Timers (Process Heating)	3%	70%	10.321	3%	10	0.0001235	M	1.6%	6.37
			Water Heater Cycling	0%	50%	0.258	2%	10	0.0001235	M	1.6%	6.29
	ROB	Air Compression	Variable Displacement Compressor	0%	30%	0.000	10%	15	0.0001235	L	0.5%	0.57
		HVAC	Destratification Fans	1%	20%	0.233	20%	10	0.0001235	M	5.0%	0.62
			HE Heat Pumps, Including Geothermal	1%	33%	0.268	8%	15	0.0001235	L	0.5%	0.49
			HE HVAC System Design	5%	10%	1.339	8%	15	0.0001235	L	0.5%	0.77
			Industrial Air Curtains	1%	80%	0.688	2%	5	0.0001235	M	5.0%	0.43
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.660	12%	15	0.0001235	L	0.5%	3.00
			HE Packaged AC	1%	20%	0.230	25%	10	0.0001235	M	5.0%	3.28
			HE Rooftop Ac Systems	1%	10%	0.230	25%	10	0.0001235	M	5.0%	3.28
			Heat Reclaim Absorption Chillers	0%	1%	0.041	90%	15	0.0001235	L	0.5%	5.14
		Motors	Motor - Nema Premium Efficiency	6%	50%	1.047	2%	25	0.0001235	O	1.0%	1.42
				17%	50%	3.140	2%	25	0.0001235	O	1.0%	1.42
				35%	50%	6.280	2%	25	0.0001235	O	1.0%	1.42
			Replace Hydraulic or Inefficient Machine with Efficient, Eelc	6%	10%	15.254	67%	15	0.0001235	L	0.5%	0.55

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Chemicals	ROB	Other	Motor - Nema Premium Efficiency	19%	50%	3.501	1%	25	0.0001235	O	1.0%	1.38
			Transformers (Nema Tier Ii)	4%	5%	0.620	2%	30	0.0001235	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	8%	50%	3.108	1%	10	0.0001235	M	5.0%	0.83
			Energy Efficient Equipment	8%	50%	1.794	1%	20	0.0001235	M	5.0%	0.32
			HE Compressors	4%	50%	1.116	8%	15	0.0001235	L	0.5%	1.74
			HE Condensers	4%	50%	1.116	2%	15	0.0001235	L	0.5%	1.74
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.031	2%	15	0.0001235	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.052	2%	8	0.0001235	M	5.0%	0.36
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.225	15%	5	0.0001235	M	5.0%	2.94
Chemicals Total												
Electrical Equipme	NC	HVAC	Air Sealing	14%	5%	0.441	17%	15	0.0001640	L	0.5%	0.17
			Cool Roofs And Exterior Walls	17%	2%	0.552	12%	15	0.0001640	L	0.5%	0.06
			HE (ES) Building Design	17%	2%	0.552	30%	15	0.0001640	L	0.5%	0.73
			HE (ES) Windows And Skylights	9%	5%	0.276	19%	15	0.0001640	L	0.5%	0.16
			HVAC System Commissioning	17%	0%	0.552	10%	5	0.0001640	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	11%	10%	0.353	12%	15	0.0001640	M	5.0%	3.10
		Lighting	Efficient Lighting Design/Layout	11%	40%	0.352	37%	11	0.0001640	H	12.5%	1.27
			Exterior Light Timers	3%	85%	0.083	30%	15	0.0001640	M	5.0%	6.26
			Interior Lighting Timers/Elapsed Time Switching	9%	33%	0.290	40%	25	0.0001640	H	12.5%	1.87
			Replace Exterior HID with Induction Lighting	0%	2%	0.006	43%	15	0.0001640	L	0.5%	1.74
			Replace Exterior HID with LED Lighting	0%	2%	0.006	60%	15	0.0001640	O	1.8%	1.84
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.104	10%	15	0.0001640	M	5.0%	1.99
			Replace High Bay HID with T8 (70% conv)	2%	20%	0.104	22%	15	0.0001640	H	12.5%	7.50
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.006	22%	15	0.0001640	H	12.5%	7.50
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.006	10%	15	0.0001640	M	5.0%	1.99
			Replace T12 with HP T8/T5	8%	25%	0.257	49%	15	0.0001640	M	5.0%	5.56
	Retrofit	Air Compression	Advanced Air Compression Controls	2%	30%	3.139	4%	15	0.0001640	O	3.5%	0.91
			Advanced Lubricants	0%	5%	0.650	3%	1	0.0001640	L	0.5%	3.57
			Air Compressor System Management	2%	25%	3.693	20%	2	0.0001640	O	3.0%	0.32
			Blower Purge Dryer	0%	20%	0.565	50%	15	0.0001640	L	0.5%	6.84
			Compressed Air Storage Tank	2%	50%	3.693	2%	15	0.0001640	L	0.5%	8.21
			Compressed Air System Design/Control	2%	80%	3.693	20%	15	0.0001640	L	0.5%	2.28
			Compressed Air System Isolation	2%	20%	3.693	2%	15	0.0001640	O	6.0%	0.91
			Compressed Air System Leak Repair	2%	50%	3.693	10%	2	0.0001640	O	2.0%	3.06
			Cooler Ambient Temperature (-11 Of)	2%	5%	3.693	1%	20	0.0001640	L	0.5%	7.39
			Cycling Air Dryer	1%	25%	0.942	50%	10	0.0001640	L	0.5%	2.41
			Duct In Outside Air To Compressor	2%	10%	2.826	2%	20	0.0001640	L	0.5%	7.39
			Electric Supply System Improvements	2%	10%	3.693	3%	5	0.0001640	M	1.6%	3.95
			Eliminating Wasteful Uses	2%	50%	3.693	1%	5	0.0001640	O	3.0%	2.85
			High Efficiency Air Compress (Upgrade)	2%	60%	2.826	10%	15	0.0001640	O	2.0%	0.22
			Night Shut Off For Compressor	2%	50%	2.954	10%	10	0.0001640	M	1.6%	11.45
			Oil Temperature Control	1%	33%	1.413	2%	10	0.0001640	M	1.6%	1.02
			Process - Swap CA Tools For Electric Ones	2%	70%	3.693	50%	10	0.0001640	L	0.5%	9.16
			Reduce Operating Pressure Of Compressed Air System	2%	50%	3.693	3%	20	0.0001640	O	2.0%	9.24
			Regular Maintenance	2%	50%	3.693	5%	1	0.0001640	O	2.0%	0.38
			Regulated Compressed Air Nozzles	2%	50%	3.139	2%	15	0.0001640	L	0.5%	8.21
			Vacuum Leak Repair	0%	5%	0.015	2%	2	0.0001640	O	2.0%	3.06
			Vacuum System Isolation	0%	5%	0.015	2%	5	0.0001640	O	3.0%	2.85
			VSD For Air Compressor Motors	1%	30%	2.826	10%	15	0.0001640	O	3.0%	2.41

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Electrical Equipme	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	17%	50%	30.145	15%	2	0.0001640	M	1.6%	4.39
			Controls Of Paint Or Spray Booth Exhaust/Supply System	3%	50%	4.823	20%	10	0.0001640	M	1.6%	2.06
			Cool Roofs And Exterior Walls	17%	2%	30.145	12%	15	0.0001640	L	0.5%	0.06
			Energy Management System	17%	10%	30.145	10%	5	0.0001640	M	1.6%	0.84
			HE (ES) Windows And Skylights	9%	5%	15.072	19%	15	0.0001640	L	0.5%	0.16
			HVAC System By-Pass Timer	17%	50%	30.145	5%	5	0.0001640	L	0.5%	2.80
			HVAC System Retrocommissioning*	17%	0%	30.145	10%	5	0.0001640	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	17%	20%	30.145	10%	5	0.0001640	L	0.5%	0.08
			Improve Duct Sealing	17%	15%	30.145	7%	10	0.0001640	M	1.6%	4.31
			Insulate Pipes/Lines	17%	80%	30.145	3%	5	0.0001640	M	1.6%	4.83
			Programmable Thermostat	17%	50%	30.145	4%	5	0.0001640	L	0.5%	7.08
			Thermostat Calibration	17%	10%	30.145	5%	5	0.0001640	L	0.5%	7.08
			Time Clock	17%	10%	30.145	4%	5	0.0001640	L	0.5%	7.08
			Ventilation Controls Installed	14%	5%	24.116	15%	5	0.0001640	L	0.5%	10.84
			VSD On THE Pump Or Fan Motor Of A HVAC System	2%	40%	3.014	30%	10	0.0001640	O	3.0%	0.68
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	4%	50%	7.235	30%	15	0.0001640	M	1.6%	5.49
			Chilled Water Reset, Optimizer For Chiller(S)	11%	25%	19.293	5%	15	0.0001640	M	1.6%	0.22
			Chiller Optimization Controls	11%	25%	19.293	5%	15	0.0001640	M	1.6%	1.29
			Chiller, Early Retirement	11%	5%	19.293	5%	15	0.0001640	L	0.5%	0.24
			Cooling Tower Optimization	1%	25%	2.412	5%	5	0.0001640	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	3%	2%	4.823	20%	10	0.0001640	M	1.6%	2.18
			Electric Supply System Improvements	11%	10%	19.293	3%	5	0.0001640	L	0.5%	4.09
			Motor System Optimization (Incl. Resizing and Asd)	10%	5%	18.087	6%	10	0.0001640	O	3.0%	0.68
			Ultraviolet A/C Coil Cleaning System	3%	25%	4.823	4%	2	0.0001640	L	0.5%	0.23
		Lighting	Efficient Lighting Design/Layout	11%	40%	19.217	37%	11	0.0001640	M	1.6%	1.27
			Exterior Light Timers	3%	85%	4.522	30%	15	0.0001640	M	1.6%	6.26
			Interior Lighting Timers/Elapsed Time Switching	9%	33%	15.826	40%	25	0.0001640	M	1.6%	1.87
			Replace Exterior HID with Induction Lighting	0%	2%	0.317	43%	15	0.0001640	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.317	60%	15	0.0001640	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	1%	50%	5.697	10%	15	0.0001640	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	2%	20%	5.697	22%	15	0.0001640	O	6.0%	3.47
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.317	10%	15	0.0001640	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.317	22%	15	0.0001640	O	6.0%	3.47
			Replace T12 with HP T8/T5	8%	25%	14.040	49%	15	0.0001640	O	4.0%	1.76
		Motors	Advanced Lubricants and Drivetrain Maintenance	8%	5%	14.733	3%	1	0.0001640	M	1.6%	9.53
			Fan System Efficiency Improvements	7%	10%	11.530	6%	10	0.0001640	M	1.6%	3.52
			Improved Process Scheduling and Deenergizing Idle Machi	36%	25%	64.058	3%	5	0.0001640	L	0.5%	7.34
			Improved Sensors And Process Controls	11%	40%	19.217	3%	10	0.0001640	M	1.6%	1.07
			Low-Load and Soft Start Technologies (Nola Controllers)	4%	25%	64.058	2%	10	0.0001640	O	1.3%	2.86
			Motor Early Retirement	7%	60%	12.812	5%	10	0.0001640	M	1.6%	3.52
			Motor Optimization / Variable Speed Drives (Process Fans,	10%	60%	18.577	30%	15	0.0001640	O	3.0%	2.93
			Process Rework and Scrap Reduction	36%	25%	64.058	3%	5	0.0001640	L	0.5%	7.34
			Pump System Efficiency Improvements	12%	10%	20.499	16%	10	0.0001640	M	1.6%	3.52
			Trim Existing Pump Impeller To More Closely Match Syster	6%	25%	10.249	2%	5	0.0001640	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	9%	40%	64.058	3%	2	0.0001640	O	1.3%	2.97
		Other	Advanced Lubricants	2%	5%	3.467	2%	1	0.0001640	M	1.6%	3.49
			Electric Supply System Improvements	9%	10%	15.072	3%	5	0.0001640	M	1.6%	3.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Electrical Equipme	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.867	3%	1	0.0001640	H	3.8%	3.57
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001640	M	1.6%	2.05
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1%	50%	2.261	5%	10	0.0001640	M	1.6%	0.41
			Chiller Temperature Reset	4%	50%	7.536	1%	1	0.0001640	M	1.6%	1.05
			Condensate Evaporator	2%	10%	2.826	5%	10	0.0001640	M	1.6%	1.27
			Defrost Control System	2%	25%	3.768	3%	10	0.0001640	M	1.6%	2.86
			Desuperheaters	1%	10%	1.884	5%	10	0.0001640	M	1.6%	4.58
			Economizer For Walk-In Coolers	0%	10%	0.377	10%	10	0.0001640	M	1.6%	1.00
			Electric Supply System Improvements	4%	10%	7.536	3%	5	0.0001640	M	1.6%	3.95
			Evaporate Pre-Cooler	1%	10%	1.884	5%	10	0.0001640	M	1.6%	0.21
			Evaporator Fan Controller	1%	10%	1.884	1%	10	0.0001640	M	1.6%	2.86
			Floating Head Pressure Control	2%	50%	3.768	5%	10	0.0001640	M	1.6%	1.99
			Improved Sensors And Process Controls	1%	40%	2.261	3%	10	0.0001640	M	1.6%	1.53
			Insulated Suction Lines	2%	50%	3.768	1%	5	0.0001640	H	3.8%	0.84
			Liquid Pressure Amplifiers	2%	10%	3.768	5%	5	0.0001640	M	1.6%	1.56
			Refrigeration System Maintenance	4%	25%	7.536	5%	3	0.0001640	M	1.6%	4.77
			Repair Refrigerator/Freezer Leaks	4%	50%	7.536	10%	3	0.0001640	M	1.6%	4.77
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.754	7%	15	0.0001640	M	1.6%	3.16
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.754	4%	15	0.0001640	M	1.6%	2.05
			VSD On Refrigeration Circulating Pump	2%	30%	3.768	30%	15	0.0001640	O	3.0%	2.41
			VSD On Refrigeration Fan	2%	30%	3.768	30%	15	0.0001640	O	3.0%	2.41
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.678	2%	15	0.0001640	O	3.0%	0.59
			Heat Containment Improvements	5%	70%	8.478	5%	10	0.0001640	M	1.6%	7.39
			Heat Recovery Improvements	19%	70%	33.913	5%	10	0.0001640	M	1.6%	1.04
			Heat Transfer Improvements	5%	70%	8.478	5%	10	0.0001640	M	1.6%	1.04
			Improved Sensors And Process Controls	19%	70%	33.913	8%	10	0.0001640	M	1.6%	1.04
			Load Management (Process Changes)	19%	25%	33.913	2%	10	0.0001640	M	1.6%	3.52
			Timers (Process Heating)	19%	70%	33.913	3%	10	0.0001640	M	1.6%	6.54
			Water Heater Cycling	0%	50%	0.424	2%	10	0.0001640	M	1.6%	6.45
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.180	10%	15	0.0001640	L	0.5%	0.59
		HVAC	Destratification Fans	2%	20%	0.357	20%	10	0.0001640	M	5.0%	0.64
			HE Heat Pumps, Including Geothermal	3%	33%	0.410	8%	15	0.0001640	L	0.5%	0.51
			HE HVAC System Design	14%	10%	2.049	8%	15	0.0001640	L	0.5%	0.80
			Industrial Air Curtains	3%	80%	1.053	2%	5	0.0001640	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	11%	10%	1.639	12%	15	0.0001640	L	0.5%	3.10
			HE Packaged AC	3%	20%	0.571	25%	10	0.0001640	M	5.0%	3.39
			HE Rooftop Ac Systems	3%	10%	0.571	25%	10	0.0001640	M	5.0%	3.39
			Heat Reclaim Absorption Chillers	1%	1%	0.102	90%	15	0.0001640	L	0.5%	5.31
		Motors	Motor - Nema Premium Efficiency	7%	50%	0.747	2%	25	0.0001640	O	1.0%	1.45
				11%	50%	1.120	2%	25	0.0001640	O	1.0%	1.45
				18%	50%	1.867	2%	25	0.0001640	O	1.0%	1.45
		Other	Motor - Nema Premium Efficiency	9%	50%	0.879	1%	25	0.0001640	O	1.0%	1.42
			Transformers (Nema Tier Ii)	2%	5%	0.156	2%	30	0.0001640	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	4%	50%	0.892	1%	10	0.0001640	M	5.0%	0.85
			Energy Efficient Equipment	4%	50%	0.515	1%	20	0.0001640	M	5.0%	0.33
			HE Compressors	2%	50%	0.320	8%	15	0.0001640	L	0.5%	1.78
			HE Condensers	2%	50%	0.320	2%	15	0.0001640	L	0.5%	1.78
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.050	2%	15	0.0001640	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.085	2%	8	0.0001640	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	1%	50%	0.370	15%	5	0.0001640	M	5.0%	3.02

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Electrical Equipment and Appliances Total												
Fabricated Metals	NC	HVAC	Air Sealing	8%	5%	0.165	17%	15	0.0001514	L	0.5%	0.43
			Cool Roofs And Exterior Walls	10%	2%	0.206	12%	15	0.0001514	L	0.5%	0.06
			HE (ES) Building Design	10%	2%	0.206	30%	15	0.0001514	L	0.5%	0.72
			HE (ES) Windows And Skylights	5%	5%	0.103	19%	15	0.0001514	L	0.5%	0.16
			HVAC System Commissioning	10%	0%	0.206	10%	5	0.0001514	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.088	12%	15	0.0001514	M	5.0%	3.07
		Lighting	Efficient Lighting Design/Layout	8%	40%	0.163	37%	11	0.0001514	H	12.5%	1.26
			Exterior Light Timers	2%	85%	0.038	30%	15	0.0001514	M	5.0%	6.21
			Interior Lighting Timers/Elapsed Time Switching	7%	33%	0.134	40%	25	0.0001514	H	12.5%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.003	43%	15	0.0001514	L	0.5%	1.72
			Replace Exterior HID with LED Lighting	0%	2%	0.003	60%	15	0.0001514	O	1.8%	1.83
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.059	10%	15	0.0001514	M	5.0%	1.97
			Replace High Bay HID with T8 (70% conv)	2%	20%	0.059	22%	15	0.0001514	H	12.5%	7.44
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.003	22%	15	0.0001514	H	12.5%	7.44
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.003	10%	15	0.0001514	M	5.0%	1.97
			Replace T12 with HP T8/T5	5%	25%	0.111	49%	15	0.0001514	M	5.0%	5.52
	Retrofit	Air Compression	Advanced Air Compression Controls	2%	30%	1.674	4%	15	0.0001514	O	3.5%	0.90
			Advanced Lubricants	0%	5%	0.347	3%	1	0.0001514	L	0.5%	3.55
			Air Compressor System Management	2%	25%	1.969	20%	2	0.0001514	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.301	50%	15	0.0001514	L	0.5%	6.79
			Compressed Air Storage Tank	2%	50%	1.969	2%	15	0.0001514	L	0.5%	8.14
			Compressed Air System Design/Control	2%	80%	1.969	20%	15	0.0001514	L	0.5%	2.26
			Compressed Air System Isolation	2%	20%	1.969	2%	15	0.0001514	O	6.0%	0.90
			Compressed Air System Leak Repair	2%	50%	1.969	10%	2	0.0001514	O	2.0%	3.04
			Cooler Ambient Temperature (-11 Of)	2%	5%	1.969	1%	20	0.0001514	L	0.5%	7.33
			Cycling Air Dryer	0%	25%	0.502	50%	10	0.0001514	L	0.5%	2.39
			Duct In Outside Air To Compressor	1%	10%	1.507	2%	20	0.0001514	L	0.5%	7.33
			Electric Supply System Improvements	2%	10%	1.969	3%	5	0.0001514	M	1.6%	3.92
			Eliminating Wasteful Uses	2%	50%	1.969	1%	5	0.0001514	O	3.0%	2.83
			High Efficiency Air Compress (Upgrade)	1%	60%	1.507	10%	15	0.0001514	O	2.0%	0.22
			Night Shut Off For Compressor	1%	50%	1.575	10%	10	0.0001514	M	1.6%	11.36
			Oil Temperature Control	1%	33%	0.754	2%	10	0.0001514	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	2%	70%	1.969	50%	10	0.0001514	L	0.5%	9.09
			Reduce Operating Pressure Of Compressed Air System	2%	50%	1.969	3%	20	0.0001514	O	2.0%	9.17
			Regular Maintenance	2%	50%	1.969	5%	1	0.0001514	O	2.0%	0.38
			Regulated Compressed Air Nozzles	2%	50%	1.674	2%	15	0.0001514	L	0.5%	8.14
			Vacuum Leak Repair	0%	5%	0.008	2%	2	0.0001514	O	2.0%	3.04
			Vacuum System Isolation	0%	5%	0.008	2%	5	0.0001514	O	3.0%	2.83
			VSD For Air Compressor Motors	1%	30%	1.507	10%	15	0.0001514	O	3.0%	2.40

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Fabricated Metals	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	10%	50%	11.276	15%	2	0.0001514	M	1.6%	4.35
			Controls Of Paint Or Spray Booth Exhaust/Supply System	2%	50%	1.804	20%	10	0.0001514	M	1.6%	2.04
			Cool Roofs And Exterior Walls	10%	2%	11.276	12%	15	0.0001514	L	0.5%	0.06
			Energy Management System	10%	10%	11.276	10%	5	0.0001514	M	1.6%	0.84
			HE (ES) Windows And Skylights	5%	5%	5.638	19%	15	0.0001514	L	0.5%	0.16
			HVAC System By-Pass Timer	10%	50%	11.276	5%	5	0.0001514	L	0.5%	2.77
			HVAC System Retrocommissioning*	10%	0%	11.276	10%	5	0.0001514	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	10%	20%	11.276	10%	5	0.0001514	L	0.5%	0.08
			Improve Duct Sealing	10%	15%	11.276	7%	10	0.0001514	M	1.6%	4.27
			Insulate Pipes/Lines	10%	80%	11.276	3%	5	0.0001514	M	1.6%	4.78
			Programmable Thermostat	10%	50%	11.276	4%	5	0.0001514	L	0.5%	7.01
			Thermostat Calibration	10%	10%	11.276	5%	5	0.0001514	L	0.5%	7.01
			Time Clock	10%	10%	11.276	4%	5	0.0001514	L	0.5%	7.01
			Ventilation Controls Installed	8%	5%	9.021	15%	5	0.0001514	L	0.5%	10.74
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	1.128	30%	10	0.0001514	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	2%	50%	1.810	30%	15	0.0001514	M	1.6%	5.44
			Chilled Water Reset, Optimizer For Chiller(S)	4%	25%	4.828	5%	15	0.0001514	M	1.6%	0.22
			Chiller Optimization Controls	4%	25%	4.828	5%	15	0.0001514	M	1.6%	1.27
			Chiller, Early Retirement	4%	5%	4.828	5%	15	0.0001514	L	0.5%	0.23
			Cooling Tower Optimization	1%	25%	0.603	5%	5	0.0001514	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	1%	2%	1.207	20%	10	0.0001514	M	1.6%	2.16
			Electric Supply System Improvements	4%	10%	4.828	3%	5	0.0001514	L	0.5%	4.05
			Motor System Optimization (Incl. Resizing and Asd)	4%	5%	4.526	6%	10	0.0001514	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	1%	25%	1.207	4%	2	0.0001514	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	8%	40%	8.920	37%	11	0.0001514	M	1.6%	1.26
			Exterior Light Timers	2%	85%	2.099	30%	15	0.0001514	M	1.6%	6.21
			Interior Lighting Timers/Elapsed Time Switching	7%	33%	7.346	40%	25	0.0001514	M	1.6%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.178	43%	15	0.0001514	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.178	60%	15	0.0001514	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	1%	50%	3.211	10%	15	0.0001514	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	2%	20%	3.211	22%	15	0.0001514	O	6.0%	3.44
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.178	10%	15	0.0001514	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.178	22%	15	0.0001514	O	6.0%	3.44
			Replace T12 with HP T8/T5	5%	25%	6.045	49%	15	0.0001514	O	4.0%	1.75
		Motors	Advanced Lubricants and Drivetrain Maintenance	10%	5%	11.324	3%	1	0.0001514	M	1.6%	9.46
			Fan System Efficiency Improvements	8%	10%	8.862	6%	10	0.0001514	M	1.6%	3.50
			Improved Process Scheduling and Deenergizing Idle Machi	44%	25%	49.233	3%	5	0.0001514	L	0.5%	7.28
			Improved Sensors And Process Controls	13%	40%	14.770	3%	10	0.0001514	M	1.6%	1.06
			Low-Load and Soft Start Technologies (Nola Controllers)	4%	25%	49.233	2%	10	0.0001514	O	1.3%	2.84
			Motor Early Retirement	9%	60%	9.847	5%	10	0.0001514	M	1.6%	3.50
			Motor Optimization / Variable Speed Drives (Process Fans,	13%	60%	14.278	30%	15	0.0001514	O	3.0%	2.91
			Process Rework and Scrap Reduction	44%	25%	49.233	3%	5	0.0001514	L	0.5%	7.28
			Pump System Efficiency Improvements	14%	10%	15.755	16%	10	0.0001514	M	1.6%	3.50
			Trim Existing Pump Impeller To More Closely Match Syster	7%	25%	7.877	2%	5	0.0001514	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	11%	40%	49.233	3%	2	0.0001514	O	1.3%	2.94
		Other	Advanced Lubricants	2%	5%	2.080	2%	1	0.0001514	M	1.6%	3.46
			Electric Supply System Improvements	8%	10%	9.043	3%	5	0.0001514	M	1.6%	3.82

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Fabricated Metals	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.449	3%	1	0.0001514	H	3.8%	3.55
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001514	M	1.6%	2.04
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1%	50%	1.172	5%	10	0.0001514	M	1.6%	0.41
			Chiller Temperature Reset	4%	50%	3.907	1%	1	0.0001514	M	1.6%	1.04
			Condensate Evaporator	1%	10%	1.465	5%	10	0.0001514	M	1.6%	1.26
			Defrost Control System	2%	25%	1.954	3%	10	0.0001514	M	1.6%	2.84
			Desuperheaters	1%	10%	0.977	5%	10	0.0001514	M	1.6%	4.54
			Economizer For Walk-In Coolers	0%	10%	0.195	10%	10	0.0001514	M	1.6%	0.99
			Electric Supply System Improvements	4%	10%	3.907	3%	5	0.0001514	M	1.6%	3.92
			Evaporate Pre-Cooler	1%	10%	0.977	5%	10	0.0001514	M	1.6%	0.20
			Evaporator Fan Controller	1%	10%	0.977	1%	10	0.0001514	M	1.6%	2.84
			Floating Head Pressure Control	2%	50%	1.954	5%	10	0.0001514	M	1.6%	1.98
			Improved Sensors And Process Controls	1%	40%	1.172	3%	10	0.0001514	M	1.6%	1.51
			Insulated Suction Lines	2%	50%	1.954	1%	5	0.0001514	H	3.8%	0.84
			Liquid Pressure Amplifiers	2%	10%	1.954	5%	5	0.0001514	M	1.6%	1.54
			Refrigeration System Maintenance	4%	25%	3.907	5%	3	0.0001514	M	1.6%	4.73
			Repair Refrigerator/Freezer Leaks	4%	50%	3.907	10%	3	0.0001514	M	1.6%	4.73
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.391	7%	15	0.0001514	M	1.6%	3.13
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.391	4%	15	0.0001514	M	1.6%	2.04
			VSD On Refrigeration Circulating Pump	2%	30%	1.954	30%	15	0.0001514	O	3.0%	2.40
			VSD On Refrigeration Fan	2%	30%	1.954	30%	15	0.0001514	O	3.0%	2.40
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.511	2%	15	0.0001514	O	3.0%	0.58
			Heat Containment Improvements	6%	70%	6.391	5%	10	0.0001514	M	1.6%	7.33
			Heat Recovery Improvements	23%	70%	25.566	5%	10	0.0001514	M	1.6%	1.03
			Heat Transfer Improvements	6%	70%	6.391	5%	10	0.0001514	M	1.6%	1.03
			Improved Sensors And Process Controls	23%	70%	25.566	8%	10	0.0001514	M	1.6%	1.03
			Load Management (Process Changes)	23%	25%	25.566	2%	10	0.0001514	M	1.6%	3.50
			Timers (Process Heating)	23%	70%	25.566	3%	10	0.0001514	M	1.6%	6.49
			Water Heater Cycling	0%	50%	0.320	2%	10	0.0001514	M	1.6%	6.40
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.096	10%	15	0.0001514	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.133	20%	10	0.0001514	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	2%	33%	0.153	8%	15	0.0001514	L	0.5%	0.50
			HE HVAC System Design	8%	10%	0.766	8%	15	0.0001514	L	0.5%	0.79
			Industrial Air Curtains	2%	80%	0.394	2%	5	0.0001514	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.410	12%	15	0.0001514	L	0.5%	3.07
			HE Packaged AC	1%	20%	0.143	25%	10	0.0001514	M	5.0%	3.35
			HE Rooftop Ac Systems	1%	10%	0.143	25%	10	0.0001514	M	5.0%	3.35
			Heat Reclaim Absorption Chillers	0%	1%	0.026	90%	15	0.0001514	L	0.5%	5.26
		Motors	Motor - Nema Premium Efficiency	9%	50%	0.574	2%	25	0.0001514	O	1.0%	1.44
				13%	50%	0.861	2%	25	0.0001514	O	1.0%	1.44
				22%	50%	1.435	2%	25	0.0001514	O	1.0%	1.44
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	4%	10%	4.183	67%	15	0.0001514	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	8%	50%	0.527	1%	25	0.0001514	O	1.0%	1.41
			Transformers (Nema Tier Ii)	2%	5%	0.093	2%	30	0.0001514	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	4%	50%	0.462	1%	10	0.0001514	M	5.0%	0.84
			Energy Efficient Equipment	4%	50%	0.267	1%	20	0.0001514	M	5.0%	0.33
			HE Compressors	2%	50%	0.166	8%	15	0.0001514	L	0.5%	1.77
			HE Condensers	2%	50%	0.166	2%	15	0.0001514	L	0.5%	1.77
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.038	2%	15	0.0001514	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.064	2%	8	0.0001514	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	1%	50%	0.279	15%	5	0.0001514	M	5.0%	3.00

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Fabricated Metals Total												
Food	NC	HVAC	Air Sealing	6%	5%	0.348	17%	15	0.0001442	L	0.5%	0.20
			Cool Roofs And Exterior Walls	8%	2%	0.435	12%	15	0.0001442	L	0.5%	0.06
			HE (ES) Building Design	8%	2%	0.435	30%	15	0.0001442	L	0.5%	0.71
			HE (ES) Windows And Skylights	4%	5%	0.217	19%	15	0.0001442	L	0.5%	0.16
			HVAC System Commissioning	8%	0%	0.435	10%	5	0.0001442	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.159	12%	15	0.0001442	M	5.0%	3.05
		Lighting	Efficient Lighting Design/Layout	6%	40%	0.301	37%	11	0.0001442	H	12.5%	1.26
			Exterior Light Timers	1%	85%	0.071	30%	15	0.0001442	M	5.0%	6.19
			Interior Lighting Timers/Elapsed Time Switching	5%	33%	0.248	40%	25	0.0001442	H	12.5%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.006	43%	15	0.0001442	L	0.5%	1.72
			Replace Exterior HID with LED Lighting	0%	2%	0.006	60%	15	0.0001442	O	1.8%	1.82
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.105	10%	15	0.0001442	M	5.0%	1.96
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.105	22%	15	0.0001442	H	12.5%	7.41
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.006	22%	15	0.0001442	H	12.5%	7.41
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.006	10%	15	0.0001442	M	5.0%	1.96
			Replace T12 with HP T8/T5	4%	25%	0.207	49%	15	0.0001442	M	5.0%	5.49
	Retrofit	Air Compression	Advanced Air Compression Controls	1%	30%	2.445	4%	15	0.0001442	O	3.5%	0.90
			Advanced Lubricants	0%	5%	0.506	3%	1	0.0001442	L	0.5%	3.53
			Air Compressor System Management	1%	25%	2.876	20%	2	0.0001442	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.440	50%	15	0.0001442	L	0.5%	6.76
			Compressed Air Storage Tank	1%	50%	2.876	2%	15	0.0001442	L	0.5%	8.11
			Compressed Air System Design/Control	1%	80%	2.876	20%	15	0.0001442	L	0.5%	2.25
			Compressed Air System Isolation	1%	20%	2.876	2%	15	0.0001442	O	6.0%	0.90
			Compressed Air System Leak Repair	1%	50%	2.876	10%	2	0.0001442	O	2.0%	3.03
			Cooler Ambient Temperature (-11 Of)	1%	5%	2.876	1%	20	0.0001442	L	0.5%	7.30
			Cycling Air Dryer	0%	25%	0.734	50%	10	0.0001442	L	0.5%	2.38
			Duct In Outside Air To Compressor	1%	10%	2.201	2%	20	0.0001442	L	0.5%	7.30
			Electric Supply System Improvements	1%	10%	2.876	3%	5	0.0001442	M	1.6%	3.90
			Eliminating Wasteful Uses	1%	50%	2.876	1%	5	0.0001442	O	3.0%	2.82
			High Efficiency Air Compress (Upgrade)	1%	60%	2.201	10%	15	0.0001442	O	2.0%	0.22
			Night Shut Off For Compressor	1%	50%	2.301	10%	10	0.0001442	M	1.6%	11.31
			Oil Temperature Control	0%	33%	1.100	2%	10	0.0001442	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	1%	70%	2.876	50%	10	0.0001442	L	0.5%	9.05
			Reduce Operating Pressure Of Compressed Air System	1%	50%	2.876	3%	20	0.0001442	O	2.0%	9.12
			Regular Maintenance	1%	50%	2.876	5%	1	0.0001442	O	2.0%	0.38
			Regulated Compressed Air Nozzles	1%	50%	2.445	2%	15	0.0001442	L	0.5%	8.11
			Vacuum Leak Repair	0%	5%	0.012	2%	2	0.0001442	O	2.0%	3.03
			Vacuum System Isolation	0%	5%	0.012	2%	5	0.0001442	O	3.0%	2.82
			VSD For Air Compressor Motors	0%	30%	2.201	10%	15	0.0001442	O	3.0%	2.38

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	8%	50%	23.770	15%	2	0.0001442	M	1.6%	4.32
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	3.803	20%	10	0.0001442	M	1.6%	2.03
			Cool Roofs And Exterior Walls	8%	2%	23.770	12%	15	0.0001442	L	0.5%	0.06
			Energy Management System	8%	10%	23.770	10%	5	0.0001442	M	1.6%	0.83
			HE (ES) Windows And Skylights	4%	5%	11.885	19%	15	0.0001442	L	0.5%	0.16
			HVAC System By-Pass Timer	8%	50%	23.770	5%	5	0.0001442	L	0.5%	2.75
			HVAC System Retrocommissioning*	8%	0%	23.770	10%	5	0.0001442	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	8%	20%	23.770	10%	5	0.0001442	L	0.5%	0.08
			Improve Duct Sealing	8%	15%	23.770	7%	10	0.0001442	M	1.6%	4.24
			Insulate Pipes/Lines	8%	80%	23.770	3%	5	0.0001442	M	1.6%	4.76
			Programmable Thermostat	8%	50%	23.770	4%	5	0.0001442	L	0.5%	6.98
			Thermostat Calibration	8%	10%	23.770	5%	5	0.0001442	L	0.5%	6.98
			Time Clock	8%	10%	23.770	4%	5	0.0001442	L	0.5%	6.98
			Ventilation Controls Installed	6%	5%	19.016	15%	5	0.0001442	L	0.5%	10.68
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	2.377	30%	10	0.0001442	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	3.251	30%	15	0.0001442	M	1.6%	5.41
			Chilled Water Reset, Optimizer For Chiller(S)	3%	25%	8.670	5%	15	0.0001442	M	1.6%	0.22
			Chiller Optimization Controls	3%	25%	8.670	5%	15	0.0001442	M	1.6%	1.27
			Chiller, Early Retirement	3%	5%	8.670	5%	15	0.0001442	L	0.5%	0.23
			Cooling Tower Optimization	0%	25%	1.084	5%	5	0.0001442	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	1%	2%	2.167	20%	10	0.0001442	M	1.6%	2.15
			Electric Supply System Improvements	3%	10%	8.670	3%	5	0.0001442	L	0.5%	4.02
			Motor System Optimization (Incl. Resizing and Asd)	3%	5%	8.128	6%	10	0.0001442	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	1%	25%	2.167	4%	2	0.0001442	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	6%	40%	16.463	37%	11	0.0001442	M	1.6%	1.26
			Exterior Light Timers	1%	85%	3.874	30%	15	0.0001442	M	1.6%	6.19
			Interior Lighting Timers/Elapsed Time Switching	5%	33%	13.558	40%	25	0.0001442	M	1.6%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.320	43%	15	0.0001442	L	0.5%	0.85
			Replace Exterior HID with LED Lighting	0%	2%	0.320	60%	15	0.0001442	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	1%	50%	5.752	10%	15	0.0001442	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	1%	20%	5.752	22%	15	0.0001442	O	6.0%	3.43
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.320	10%	15	0.0001442	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.320	22%	15	0.0001442	O	6.0%	3.43
			Replace T12 with HP T8/T5	4%	25%	11.330	49%	15	0.0001442	O	4.0%	1.74
		Motors	Advanced Lubricants and Drivetrain Maintenance	11%	5%	33.680	3%	1	0.0001442	M	1.6%	9.41
			Fan System Efficiency Improvements	6%	10%	17.426	6%	10	0.0001442	M	1.6%	3.48
			Improved Process Scheduling and Deenergizing Idle Machi	50%	25%	146.437	3%	5	0.0001442	L	0.5%	7.25
			Improved Sensors And Process Controls	15%	40%	43.931	3%	10	0.0001442	M	1.6%	1.05
			Low-Load and Soft Start Technologies (Nola Controllers)	5%	25%	146.437	2%	10	0.0001442	O	1.3%	2.83
			Motor Early Retirement	10%	60%	30.752	5%	10	0.0001442	M	1.6%	3.48
			Motor Optimization / Variable Speed Drives (Process Fans,	12%	60%	34.266	30%	15	0.0001442	O	3.0%	2.90
			Process Rework and Scrap Reduction	50%	25%	146.437	3%	5	0.0001442	L	0.5%	7.25
			Pump System Efficiency Improvements	8%	10%	24.016	16%	10	0.0001442	M	1.6%	3.48
			Trim Existing Pump Impeller To More Closely Match Syster	4%	25%	12.008	2%	5	0.0001442	O	1.5%	0.83
			Use of Energy Efficient Belts and Other Improved Mechanis	12%	40%	146.437	3%	2	0.0001442	O	1.3%	2.93
		Other	Advanced Lubricants	1%	5%	4.320	2%	1	0.0001442	M	1.6%	3.44
			Electric Supply System Improvements	6%	10%	18.781	3%	5	0.0001442	M	1.6%	3.80

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food	Retrofit	Process Cooling	Advanced Lubricants	3%	5%	8.403	3%	1	0.0001442	H	3.8%	3.53
			Air Curtain Technologies	7%	50%	21.921	30%	20	0.0001442	M	1.6%	2.03
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	7%	50%	21.921	5%	10	0.0001442	M	1.6%	0.40
			Chiller Temperature Reset	25%	50%	73.072	1%	1	0.0001442	M	1.6%	1.03
			Condensate Evaporator	9%	10%	27.402	5%	10	0.0001442	M	1.6%	1.26
			Defrost Control System	12%	25%	36.536	3%	10	0.0001442	M	1.6%	2.83
			Desuperheaters	6%	10%	18.268	5%	10	0.0001442	M	1.6%	4.52
			Economizer For Walk-In Coolers	1%	10%	3.654	10%	10	0.0001442	M	1.6%	0.98
			Electric Supply System Improvements	25%	10%	73.072	3%	5	0.0001442	M	1.6%	3.90
			Evaporate Pre-Cooler	6%	10%	18.268	5%	10	0.0001442	M	1.6%	0.20
			Evaporator Fan Controller	6%	10%	18.268	1%	10	0.0001442	M	1.6%	2.83
			Floating Head Pressure Control	12%	50%	36.536	5%	10	0.0001442	M	1.6%	1.97
			Improved Sensors And Process Controls	7%	40%	21.921	3%	10	0.0001442	M	1.6%	1.51
			Insulated Suction Lines	12%	50%	36.536	1%	5	0.0001442	H	3.8%	0.83
			Liquid Pressure Amplifiers	12%	10%	36.536	5%	5	0.0001442	M	1.6%	1.54
			Refrigeration System Maintenance	25%	25%	73.072	5%	3	0.0001442	M	1.6%	4.71
			Repair Refrigerator/Freezer Leaks	25%	50%	73.072	10%	3	0.0001442	M	1.6%	4.71
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	2%	0%	7.307	7%	15	0.0001442	M	1.6%	3.12
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	2%	0%	7.307	4%	15	0.0001442	M	1.6%	2.03
			VSD On Refrigeration Circulating Pump	12%	30%	36.536	30%	15	0.0001442	O	3.0%	2.38
			VSD On Refrigeration Fan	12%	30%	36.536	30%	15	0.0001442	O	3.0%	2.38
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1%	35%	3.169	2%	15	0.0001442	O	3.0%	0.58
			Heat Containment Improvements	1%	70%	2.201	5%	10	0.0001442	M	1.6%	7.30
			Heat Recovery Improvements	3%	70%	8.804	5%	10	0.0001442	M	1.6%	1.03
			Heat Transfer Improvements	1%	70%	2.201	5%	10	0.0001442	M	1.6%	1.03
			Improved Sensors And Process Controls	3%	70%	8.804	8%	10	0.0001442	M	1.6%	1.03
			Load Management (Process Changes)	3%	25%	8.804	2%	10	0.0001442	M	1.6%	3.48
			Timers (Process Heating)	3%	70%	8.804	3%	10	0.0001442	M	1.6%	6.46
			Water Heater Cycling	1%	50%	1.981	2%	10	0.0001442	M	1.6%	6.37
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.140	10%	15	0.0001442	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.281	20%	10	0.0001442	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	1%	33%	0.323	8%	15	0.0001442	L	0.5%	0.50
			HE HVAC System Design	6%	10%	1.616	8%	15	0.0001442	L	0.5%	0.78
			Industrial Air Curtains	1%	80%	0.830	2%	5	0.0001442	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.737	12%	15	0.0001442	L	0.5%	3.05
			HE Packaged AC	1%	20%	0.256	25%	10	0.0001442	M	5.0%	3.33
			HE Rooftop Ac Systems	1%	10%	0.256	25%	10	0.0001442	M	5.0%	3.33
			Heat Reclaim Absorption Chillers	0%	1%	0.046	90%	15	0.0001442	L	0.5%	5.23
		Motors	Motor - Nema Premium Efficiency	10%	50%	1.793	2%	25	0.0001442	O	1.0%	1.44
				12%	50%	2.134	2%	25	0.0001442	O	1.0%	1.44
				27%	50%	4.610	2%	25	0.0001442	O	1.0%	1.44
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	5%	10%	12.442	67%	15	0.0001442	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	6%	50%	1.095	1%	25	0.0001442	O	1.0%	1.40
			Transformers (Nema Tier Ii)	1%	5%	0.194	2%	30	0.0001442	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	25%	50%	8.644	1%	10	0.0001442	M	5.0%	0.84
			Energy Efficient Equipment	25%	50%	4.991	1%	20	0.0001442	M	5.0%	0.33
			HE Compressors	12%	50%	3.104	8%	15	0.0001442	L	0.5%	1.76
			HE Condensers	12%	50%	3.104	2%	15	0.0001442	L	0.5%	1.76
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.004	2%	15	0.0001442	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.006	2%	8	0.0001442	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.010	15%	5	0.0001442	M	5.0%	2.98

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Food Total												
Machinery	NC	HVAC	Air Sealing	15%	5%	0.405	17%	15	0.0001640	L	0.5%	0.29
			Cool Roofs And Exterior Walls	18%	2%	0.506	12%	15	0.0001640	L	0.5%	0.06
			HE (ES) Building Design	18%	2%	0.506	30%	15	0.0001640	L	0.5%	0.73
			HE (ES) Windows And Skylights	9%	5%	0.253	19%	15	0.0001640	L	0.5%	0.16
			HVAC System Commissioning	18%	0%	0.506	10%	5	0.0001640	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8%	10%	0.217	12%	15	0.0001640	M	5.0%	3.10
		Lighting	Efficient Lighting Design/Layout	12%	40%	0.320	37%	11	0.0001640	H	12.5%	1.27
			Exterior Light Timers	3%	85%	0.075	30%	15	0.0001640	M	5.0%	6.26
			Interior Lighting Timers/Elapsed Time Switching	10%	33%	0.264	40%	25	0.0001640	H	12.5%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.005	43%	15	0.0001640	L	0.5%	1.74
			Replace Exterior HID with LED Lighting	0%	2%	0.005	60%	15	0.0001640	O	1.8%	1.84
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.095	10%	15	0.0001640	M	5.0%	1.98
			Replace High Bay HID with T8 (70% conv)	2%	20%	0.095	22%	15	0.0001640	H	12.5%	7.48
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.005	22%	15	0.0001640	H	12.5%	7.48
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.005	10%	15	0.0001640	M	5.0%	1.98
			Replace T12 with HP T8/T5	9%	25%	0.234	49%	15	0.0001640	M	5.0%	5.55
	Retrofit	Air Compression	Advanced Air Compression Controls	2%	30%	3.129	4%	15	0.0001640	O	3.5%	0.91
			Advanced Lubricants	0%	5%	0.648	3%	1	0.0001640	L	0.5%	3.57
			Air Compressor System Management	2%	25%	3.681	20%	2	0.0001640	O	3.0%	0.32
			Blower Purge Dryer	0%	20%	0.563	50%	15	0.0001640	L	0.5%	6.84
			Compressed Air Storage Tank	2%	50%	3.681	2%	15	0.0001640	L	0.5%	8.21
			Compressed Air System Design/Control	2%	80%	3.681	20%	15	0.0001640	L	0.5%	2.28
			Compressed Air System Isolation	2%	20%	3.681	2%	15	0.0001640	O	6.0%	0.91
			Compressed Air System Leak Repair	2%	50%	3.681	10%	2	0.0001640	O	2.0%	3.06
			Cooler Ambient Temperature (-11 Of)	2%	5%	3.681	1%	20	0.0001640	L	0.5%	7.39
			Cycling Air Dryer	1%	25%	0.939	50%	10	0.0001640	L	0.5%	2.41
			Duct In Outside Air To Compressor	2%	10%	2.817	2%	20	0.0001640	L	0.5%	7.39
			Electric Supply System Improvements	2%	10%	3.681	3%	5	0.0001640	M	1.6%	3.95
			Eliminating Wasteful Uses	2%	50%	3.681	1%	5	0.0001640	O	3.0%	2.85
			High Efficiency Air Compress (Upgrade)	2%	60%	2.817	10%	15	0.0001640	O	2.0%	0.22
			Night Shut Off For Compressor	2%	50%	2.945	10%	10	0.0001640	M	1.6%	11.45
			Oil Temperature Control	1%	33%	1.409	2%	10	0.0001640	M	1.6%	1.02
			Process - Swap CA Tools For Electric Ones	2%	70%	3.681	50%	10	0.0001640	L	0.5%	9.16
			Reduce Operating Pressure Of Compressed Air System	2%	50%	3.681	3%	20	0.0001640	O	2.0%	9.24
			Regular Maintenance	2%	50%	3.681	5%	1	0.0001640	O	2.0%	0.38
			Regulated Compressed Air Nozzles	2%	50%	3.129	2%	15	0.0001640	L	0.5%	8.21
			Vacuum Leak Repair	0%	5%	0.015	2%	2	0.0001640	O	2.0%	3.06
			Vacuum System Isolation	0%	5%	0.015	2%	5	0.0001640	O	3.0%	2.85
			VSD For Air Compressor Motors	1%	30%	2.817	10%	15	0.0001640	O	3.0%	2.41

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	18%	50%	27.646	15%	2	0.0001640	M	1.6%	4.39
			Controls Of Paint Or Spray Booth Exhaust/Supply System	3%	50%	4.423	20%	10	0.0001640	M	1.6%	2.06
			Cool Roofs And Exterior Walls	18%	2%	27.646	12%	15	0.0001640	L	0.5%	0.06
			Energy Management System	18%	10%	27.646	10%	5	0.0001640	M	1.6%	0.84
			HE (ES) Windows And Skylights	9%	5%	13.823	19%	15	0.0001640	L	0.5%	0.16
			HVAC System By-Pass Timer	18%	50%	27.646	5%	5	0.0001640	L	0.5%	2.80
			HVAC System Retrocommissioning*	18%	0%	27.646	10%	5	0.0001640	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	18%	20%	27.646	10%	5	0.0001640	L	0.5%	0.08
			Improve Duct Sealing	18%	15%	27.646	7%	10	0.0001640	M	1.6%	4.31
			Insulate Pipes/Lines	18%	80%	27.646	3%	5	0.0001640	M	1.6%	4.83
			Programmable Thermostat	18%	50%	27.646	4%	5	0.0001640	L	0.5%	7.08
			Thermostat Calibration	18%	10%	27.646	5%	5	0.0001640	L	0.5%	7.08
			Time Clock	18%	10%	27.646	4%	5	0.0001640	L	0.5%	7.08
			Ventilation Controls Installed	15%	5%	22.117	15%	5	0.0001640	L	0.5%	10.84
			VSD On THE Pump Or Fan Motor Of A HVAC System	2%	40%	2.765	30%	10	0.0001640	O	3.0%	0.68
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	3%	50%	4.439	30%	15	0.0001640	M	1.6%	5.49
			Chilled Water Reset, Optimizer For Chiller(S)	8%	25%	11.837	5%	15	0.0001640	M	1.6%	0.22
			Chiller Optimization Controls	8%	25%	11.837	5%	15	0.0001640	M	1.6%	1.29
			Chiller, Early Retirement	8%	5%	11.837	5%	15	0.0001640	L	0.5%	0.24
			Cooling Tower Optimization	1%	25%	1.480	5%	5	0.0001640	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	2%	2%	2.959	20%	10	0.0001640	M	1.6%	2.18
			Electric Supply System Improvements	8%	10%	11.837	3%	5	0.0001640	L	0.5%	4.09
			Motor System Optimization (Incl. Resizing and Asd)	7%	5%	11.097	6%	10	0.0001640	O	3.0%	0.68
			Ultraviolet A/C Coil Cleaning System	2%	25%	2.959	4%	2	0.0001640	L	0.5%	0.23
		Lighting	Efficient Lighting Design/Layout	12%	40%	17.496	37%	11	0.0001640	M	1.6%	1.27
			Exterior Light Timers	3%	85%	4.117	30%	15	0.0001640	M	1.6%	6.26
			Interior Lighting Timers/Elapsed Time Switching	10%	33%	14.409	40%	25	0.0001640	M	1.6%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.288	43%	15	0.0001640	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.288	60%	15	0.0001640	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	1%	50%	5.187	10%	15	0.0001640	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	2%	20%	5.187	22%	15	0.0001640	O	6.0%	3.46
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.288	10%	15	0.0001640	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.288	22%	15	0.0001640	O	6.0%	3.46
			Replace T12 with HP T8/T5	9%	25%	12.783	49%	15	0.0001640	O	4.0%	1.75
		Motors	Advanced Lubricants and Drivetrain Maintenance	11%	5%	16.760	3%	1	0.0001640	M	1.6%	9.53
			Fan System Efficiency Improvements	9%	10%	13.117	6%	10	0.0001640	M	1.6%	3.52
			Improved Process Scheduling and Deenergizing Idle Machi	49%	25%	72.870	3%	5	0.0001640	L	0.5%	7.34
			Improved Sensors And Process Controls	15%	40%	21.861	3%	10	0.0001640	M	1.6%	1.07
			Low-Load and Soft Start Technologies (Nola Controllers)	5%	25%	72.870	2%	10	0.0001640	O	1.3%	2.86
			Motor Early Retirement	10%	60%	14.574	5%	10	0.0001640	M	1.6%	3.52
			Motor Optimization / Variable Speed Drives (Process Fans,	14%	60%	21.132	30%	15	0.0001640	O	3.0%	2.93
			Process Rework and Scrap Reduction	49%	25%	72.870	3%	5	0.0001640	L	0.5%	7.34
			Pump System Efficiency Improvements	16%	10%	23.319	16%	10	0.0001640	M	1.6%	3.52
			Trim Existing Pump Impeller To More Closely Match Syster	8%	25%	11.659	2%	5	0.0001640	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	12%	40%	72.870	3%	2	0.0001640	O	1.3%	2.97
		Other	Advanced Lubricants	1%	5%	2.073	2%	1	0.0001640	M	1.6%	3.49
			Electric Supply System Improvements	6%	10%	9.015	3%	5	0.0001640	M	1.6%	3.85

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.570	3%	1	0.0001640	H	3.8%	3.57
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001640	M	1.6%	2.05
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1%	50%	1.487	5%	10	0.0001640	M	1.6%	0.41
			Chiller Temperature Reset	3%	50%	4.958	1%	1	0.0001640	M	1.6%	1.05
			Condensate Evaporator	1%	10%	1.859	5%	10	0.0001640	M	1.6%	1.27
			Defrost Control System	2%	25%	2.479	3%	10	0.0001640	M	1.6%	2.86
			Desuperheaters	1%	10%	1.240	5%	10	0.0001640	M	1.6%	4.58
			Economizer For Walk-In Coolers	0%	10%	0.248	10%	10	0.0001640	M	1.6%	1.00
			Electric Supply System Improvements	3%	10%	4.958	3%	5	0.0001640	M	1.6%	3.95
			Evaporate Pre-Cooler	1%	10%	1.240	5%	10	0.0001640	M	1.6%	0.21
			Evaporator Fan Controller	1%	10%	1.240	1%	10	0.0001640	M	1.6%	2.86
			Floating Head Pressure Control	2%	50%	2.479	5%	10	0.0001640	M	1.6%	1.99
			Improved Sensors And Process Controls	1%	40%	1.487	3%	10	0.0001640	M	1.6%	1.53
			Insulated Suction Lines	2%	50%	2.479	1%	5	0.0001640	H	3.8%	0.84
			Liquid Pressure Amplifiers	2%	10%	2.479	5%	5	0.0001640	M	1.6%	1.56
			Refrigeration System Maintenance	3%	25%	4.958	5%	3	0.0001640	M	1.6%	4.77
			Repair Refrigerator/Freezer Leaks	3%	50%	4.958	10%	3	0.0001640	M	1.6%	4.77
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.496	7%	15	0.0001640	M	1.6%	3.16
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.496	4%	15	0.0001640	M	1.6%	2.05
			VSD On Refrigeration Circulating Pump	2%	30%	2.479	30%	15	0.0001640	O	3.0%	2.41
			VSD On Refrigeration Fan	2%	30%	2.479	30%	15	0.0001640	O	3.0%	2.41
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.222	2%	15	0.0001640	O	3.0%	0.59
			Heat Containment Improvements	2%	70%	2.780	5%	10	0.0001640	M	1.6%	7.39
			Heat Recovery Improvements	7%	70%	11.118	5%	10	0.0001640	M	1.6%	1.04
			Heat Transfer Improvements	2%	70%	2.780	5%	10	0.0001640	M	1.6%	1.04
			Improved Sensors And Process Controls	7%	70%	11.118	8%	10	0.0001640	M	1.6%	1.04
			Load Management (Process Changes)	7%	25%	11.118	2%	10	0.0001640	M	1.6%	3.52
			Timers (Process Heating)	7%	70%	11.118	3%	10	0.0001640	M	1.6%	6.54
			Water Heater Cycling	0%	50%	0.139	2%	10	0.0001640	M	1.6%	6.45
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.180	10%	15	0.0001640	L	0.5%	0.59
		HVAC	Destratification Fans	2%	20%	0.327	20%	10	0.0001640	M	5.0%	0.64
			HE Heat Pumps, Including Geothermal	3%	33%	0.376	8%	15	0.0001640	L	0.5%	0.51
			HE HVAC System Design	15%	10%	1.879	8%	15	0.0001640	L	0.5%	0.80
			Industrial Air Curtains	3%	80%	0.966	2%	5	0.0001640	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8%	10%	1.006	12%	15	0.0001640	L	0.5%	3.10
			HE Packaged AC	2%	20%	0.350	25%	10	0.0001640	M	5.0%	3.39
			HE Rooftop Ac Systems	2%	10%	0.350	25%	10	0.0001640	M	5.0%	3.39
			Heat Reclaim Absorption Chillers	0%	1%	0.063	90%	15	0.0001640	L	0.5%	5.31
		Motors	Motor - Nema Premium Efficiency	10%	50%	0.850	2%	25	0.0001640	O	1.0%	1.45
				15%	50%	1.275	2%	25	0.0001640	O	1.0%	1.45
				24%	50%	2.124	2%	25	0.0001640	O	1.0%	1.45
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	5%	10%	6.192	67%	15	0.0001640	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	6%	50%	0.526	1%	25	0.0001640	O	1.0%	1.42
			Transformers (Nema Tier Ii)	1%	5%	0.093	2%	30	0.0001640	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	3%	50%	0.587	1%	10	0.0001640	M	5.0%	0.85
			Energy Efficient Equipment	3%	50%	0.339	1%	20	0.0001640	M	5.0%	0.33
			HE Compressors	2%	50%	0.211	8%	15	0.0001640	L	0.5%	1.78
			HE Condensers	2%	50%	0.211	2%	15	0.0001640	L	0.5%	1.78
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.017	2%	15	0.0001640	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.028	2%	8	0.0001640	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.121	15%	5	0.0001640	M	5.0%	3.02

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Machinery Total												
Metals Primary	NC	HVAC	Air Sealing	3%	5%	0.103	17%	15	0.0001340	L	0.5%	0.12
			Cool Roofs And Exterior Walls	4%	2%	0.129	12%	15	0.0001340	L	0.5%	0.06
			HE (ES) Building Design	4%	2%	0.129	30%	15	0.0001340	L	0.5%	0.71
			HE (ES) Windows And Skylights	2%	5%	0.064	19%	15	0.0001340	L	0.5%	0.16
			HVAC System Commissioning	4%	0%	0.129	10%	5	0.0001340	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2%	10%	0.052	12%	15	0.0001340	M	5.0%	3.03
		Lighting	Efficient Lighting Design/Layout	2%	40%	0.081	37%	11	0.0001340	H	12.5%	1.24
			Exterior Light Timers	1%	85%	0.019	30%	15	0.0001340	M	5.0%	6.15
			Interior Lighting Timers/Elapsed Time Switching	2%	33%	0.067	40%	25	0.0001340	H	12.5%	1.82
			Replace Exterior HID with Induction Lighting	0%	2%	0.002	43%	15	0.0001340	L	0.5%	1.71
			Replace Exterior HID with LED Lighting	0%	2%	0.002	60%	15	0.0001340	O	1.8%	1.81
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.040	10%	15	0.0001340	M	5.0%	1.93
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.040	22%	15	0.0001340	H	12.5%	7.29
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.002	22%	15	0.0001340	H	12.5%	7.29
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.002	10%	15	0.0001340	M	5.0%	1.93
			Replace T12 with HP T8/T5	1%	25%	0.043	49%	15	0.0001340	M	5.0%	5.41
	Retrofit	Air Compression	Advanced Air Compression Controls	1%	30%	1.050	4%	15	0.0001340	O	3.5%	0.89
			Advanced Lubricants	0%	5%	0.217	3%	1	0.0001340	L	0.5%	3.51
			Air Compressor System Management	1%	25%	1.236	20%	2	0.0001340	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.189	50%	15	0.0001340	L	0.5%	6.71
			Compressed Air Storage Tank	1%	50%	1.236	2%	15	0.0001340	L	0.5%	8.05
			Compressed Air System Design/Control	1%	80%	1.236	20%	15	0.0001340	L	0.5%	2.24
			Compressed Air System Isolation	1%	20%	1.236	2%	15	0.0001340	O	6.0%	0.89
			Compressed Air System Leak Repair	1%	50%	1.236	10%	2	0.0001340	O	2.0%	3.01
			Cooler Ambient Temperature (-11 Of)	1%	5%	1.236	1%	20	0.0001340	L	0.5%	7.25
			Cycling Air Dryer	0%	25%	0.315	50%	10	0.0001340	L	0.5%	2.36
			Duct In Outside Air To Compressor	1%	10%	0.946	2%	20	0.0001340	L	0.5%	7.25
			Electric Supply System Improvements	1%	10%	1.236	3%	5	0.0001340	M	1.6%	3.88
			Eliminating Wasteful Uses	1%	50%	1.236	1%	5	0.0001340	O	3.0%	2.80
			High Efficiency Air Compress (Upgrade)	1%	60%	0.946	10%	15	0.0001340	O	2.0%	0.22
			Night Shut Off For Compressor	1%	50%	0.989	10%	10	0.0001340	M	1.6%	11.23
			Oil Temperature Control	0%	33%	0.473	2%	10	0.0001340	M	1.6%	1.00
			Process - Swap CA Tools For Electric Ones	1%	70%	1.236	50%	10	0.0001340	L	0.5%	8.99
			Reduce Operating Pressure Of Compressed Air System	1%	50%	1.236	3%	20	0.0001340	O	2.0%	9.06
			Regular Maintenance	1%	50%	1.236	5%	1	0.0001340	O	2.0%	0.37
			Regulated Compressed Air Nozzles	1%	50%	1.050	2%	15	0.0001340	L	0.5%	8.05
			Vacuum Leak Repair	0%	5%	0.005	2%	2	0.0001340	O	2.0%	3.01
			Vacuum System Isolation	0%	5%	0.005	2%	5	0.0001340	O	3.0%	2.80
			VSD For Air Compressor Motors	0%	30%	0.946	10%	15	0.0001340	O	3.0%	2.37

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Metals Primary	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	4%	50%	7.025	15%	2	0.0001340	M	1.6%	4.29
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	1.124	20%	10	0.0001340	M	1.6%	2.01
			Cool Roofs And Exterior Walls	4%	2%	7.025	12%	15	0.0001340	L	0.5%	0.06
			Energy Management System	4%	10%	7.025	10%	5	0.0001340	M	1.6%	0.82
			HE (ES) Windows And Skylights	2%	5%	3.512	19%	15	0.0001340	L	0.5%	0.16
			HVAC System By-Pass Timer	4%	50%	7.025	5%	5	0.0001340	L	0.5%	2.73
			HVAC System Retrocommissioning*	4%	0%	7.025	10%	5	0.0001340	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	4%	20%	7.025	10%	5	0.0001340	L	0.5%	0.08
			Improve Duct Sealing	4%	15%	7.025	7%	10	0.0001340	M	1.6%	4.21
			Insulate Pipes/Lines	4%	80%	7.025	3%	5	0.0001340	M	1.6%	4.72
			Programmable Thermostat	4%	50%	7.025	4%	5	0.0001340	L	0.5%	6.92
			Thermostat Calibration	4%	10%	7.025	5%	5	0.0001340	L	0.5%	6.92
			Time Clock	4%	10%	7.025	4%	5	0.0001340	L	0.5%	6.92
			Ventilation Controls Installed	3%	5%	5.620	15%	5	0.0001340	L	0.5%	10.59
			VSD On THE Pump Or Fan Motor Of A HVAC System	0%	40%	0.702	30%	10	0.0001340	O	3.0%	0.66
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	1.070	30%	15	0.0001340	M	1.6%	5.37
			Chilled Water Reset, Optimizer For Chiller(S)	2%	25%	2.853	5%	15	0.0001340	M	1.6%	0.22
			Chiller Optimization Controls	2%	25%	2.853	5%	15	0.0001340	M	1.6%	1.26
			Chiller, Early Retirement	2%	5%	2.853	5%	15	0.0001340	L	0.5%	0.23
			Cooling Tower Optimization	0%	25%	0.357	5%	5	0.0001340	M	1.6%	0.27
			Economizer (Hydronic Or Outside Air)	0%	2%	0.713	20%	10	0.0001340	M	1.6%	2.13
			Electric Supply System Improvements	2%	10%	2.853	3%	5	0.0001340	L	0.5%	3.99
			Motor System Optimization (Incl. Resizing and Asd)	1%	5%	2.675	6%	10	0.0001340	O	3.0%	0.66
			Ultraviolet A/C Coil Cleaning System	0%	25%	0.713	4%	2	0.0001340	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	2%	40%	4.440	37%	11	0.0001340	M	1.6%	1.24
			Exterior Light Timers	1%	85%	1.045	30%	15	0.0001340	M	1.6%	6.15
			Interior Lighting Timers/Elapsed Time Switching	2%	33%	3.656	40%	25	0.0001340	M	1.6%	1.82
			Replace Exterior HID with Induction Lighting	0%	2%	0.120	43%	15	0.0001340	L	0.5%	0.85
			Replace Exterior HID with LED Lighting	0%	2%	0.120	60%	15	0.0001340	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	0%	50%	2.163	10%	15	0.0001340	O	1.3%	0.55
			Replace High Bay HID with T8 (70% conv)	1%	20%	2.163	22%	15	0.0001340	O	6.0%	3.38
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.120	10%	15	0.0001340	O	1.3%	0.55
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.120	22%	15	0.0001340	O	6.0%	3.38
			Replace T12 with HP T8/T5	1%	25%	2.351	49%	15	0.0001340	O	4.0%	1.71
		Motors	Advanced Lubricants and Drivetrain Maintenance	7%	5%	13.298	3%	1	0.0001340	M	1.6%	9.35
			Fan System Efficiency Improvements	3%	10%	5.782	6%	10	0.0001340	M	1.6%	3.46
			Improved Process Scheduling and Deenergizing Idle Machi	32%	25%	57.819	3%	5	0.0001340	L	0.5%	7.20
			Improved Sensors And Process Controls	10%	40%	17.346	3%	10	0.0001340	M	1.6%	1.05
			Low-Load and Soft Start Technologies (Nola Controllers)	3%	25%	57.819	2%	10	0.0001340	O	1.3%	2.81
			Motor Early Retirement	6%	60%	11.564	5%	10	0.0001340	M	1.6%	3.46
			Motor Optimization / Variable Speed Drives (Process Fans,	8%	60%	13.877	30%	15	0.0001340	O	3.0%	2.88
			Process Rework and Scrap Reduction	32%	25%	57.819	3%	5	0.0001340	L	0.5%	7.20
			Pump System Efficiency Improvements	6%	10%	10.407	16%	10	0.0001340	M	1.6%	3.46
			Trim Existing Pump Impeller To More Closely Match Syster	3%	25%	5.204	2%	5	0.0001340	O	1.5%	0.83
			Use of Energy Efficient Belts and Other Improved Mechanis	8%	40%	57.819	3%	2	0.0001340	O	1.3%	2.91
		Other	Advanced Lubricants	7%	5%	13.091	2%	1	0.0001340	M	1.6%	3.42
			Electric Supply System Improvements	32%	10%	56.918	3%	5	0.0001340	M	1.6%	3.78

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Metals Primary	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.166	3%	1	0.0001340	H	3.8%	3.51
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001340	M	1.6%	2.01
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0%	50%	0.432	5%	10	0.0001340	M	1.6%	0.40
			Chiller Temperature Reset	1%	50%	1.441	1%	1	0.0001340	M	1.6%	1.03
			Condensate Evaporator	0%	10%	0.540	5%	10	0.0001340	M	1.6%	1.25
			Defrost Control System	0%	25%	0.720	3%	10	0.0001340	M	1.6%	2.81
			Desuperheaters	0%	10%	0.360	5%	10	0.0001340	M	1.6%	4.49
			Economizer For Walk-In Coolers	0%	10%	0.072	10%	10	0.0001340	M	1.6%	0.98
			Electric Supply System Improvements	1%	10%	1.441	3%	5	0.0001340	M	1.6%	3.88
			Evaporate Pre-Cooler	0%	10%	0.360	5%	10	0.0001340	M	1.6%	0.20
			Evaporator Fan Controller	0%	10%	0.360	1%	10	0.0001340	M	1.6%	2.81
			Floating Head Pressure Control	0%	50%	0.720	5%	10	0.0001340	M	1.6%	1.95
			Improved Sensors And Process Controls	0%	40%	0.432	3%	10	0.0001340	M	1.6%	1.50
			Insulated Suction Lines	0%	50%	0.720	1%	5	0.0001340	H	3.8%	0.83
			Liquid Pressure Amplifiers	0%	10%	0.720	5%	5	0.0001340	M	1.6%	1.53
			Refrigeration System Maintenance	1%	25%	1.441	5%	3	0.0001340	M	1.6%	4.67
			Repair Refrigerator/Freezer Leaks	1%	50%	1.441	10%	3	0.0001340	M	1.6%	4.67
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.144	7%	15	0.0001340	M	1.6%	3.10
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.144	4%	15	0.0001340	M	1.6%	2.01
			VSD On Refrigeration Circulating Pump	0%	30%	0.720	30%	15	0.0001340	O	3.0%	2.37
			VSD On Refrigeration Fan	0%	30%	0.720	30%	15	0.0001340	O	3.0%	2.37
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1%	35%	1.012	2%	15	0.0001340	O	3.0%	0.58
			Heat Containment Improvements	7%	70%	12.654	5%	10	0.0001340	M	1.6%	7.25
			Heat Recovery Improvements	28%	70%	50.614	5%	10	0.0001340	M	1.6%	1.02
			Heat Transfer Improvements	7%	70%	12.654	5%	10	0.0001340	M	1.6%	1.02
			Improved Sensors And Process Controls	28%	70%	50.614	8%	10	0.0001340	M	1.6%	1.02
			Load Management (Process Changes)	28%	25%	50.614	2%	10	0.0001340	M	1.6%	3.46
			Timers (Process Heating)	28%	70%	50.614	3%	10	0.0001340	M	1.6%	6.42
			Water Heater Cycling	0%	50%	0.633	2%	10	0.0001340	M	1.6%	6.33
	ROB	Air Compression	Variable Displacement Compressor	0%	30%	0.060	10%	15	0.0001340	L	0.5%	0.58
		HVAC	Destratification Fans	0%	20%	0.083	20%	10	0.0001340	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	1%	33%	0.095	8%	15	0.0001340	L	0.5%	0.49
			HE HVAC System Design	3%	10%	0.477	8%	15	0.0001340	L	0.5%	0.78
			Industrial Air Curtains	1%	80%	0.245	2%	5	0.0001340	M	5.0%	0.43
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2%	10%	0.242	12%	15	0.0001340	L	0.5%	3.03
			HE Packaged AC	0%	20%	0.084	25%	10	0.0001340	M	5.0%	3.31
			HE Rooftop Ac Systems	0%	10%	0.084	25%	10	0.0001340	M	5.0%	3.31
			Heat Reclaim Absorption Chillers	0%	1%	0.015	90%	15	0.0001340	L	0.5%	5.18
		Motors	Motor - Nema Premium Efficiency	6%	50%	0.674	2%	25	0.0001340	O	1.0%	1.43
				10%	50%	1.011	2%	25	0.0001340	O	1.0%	1.43
				16%	50%	1.685	2%	25	0.0001340	O	1.0%	1.43
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	3%	10%	4.913	67%	15	0.0001340	L	0.5%	0.55
		Other	Motor - Nema Premium Efficiency	32%	50%	3.318	1%	25	0.0001340	O	1.0%	1.39
			Transformers (Nema Tier Ii)	6%	5%	0.588	2%	30	0.0001340	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	1%	50%	0.170	1%	10	0.0001340	M	5.0%	0.83
			Energy Efficient Equipment	1%	50%	0.098	1%	20	0.0001340	M	5.0%	0.32
			HE Compressors	0%	50%	0.061	8%	15	0.0001340	L	0.5%	1.75
			HE Condensers	0%	50%	0.061	2%	15	0.0001340	L	0.5%	1.75
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.075	2%	15	0.0001340	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.127	2%	8	0.0001340	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	1%	50%	0.552	15%	5	0.0001340	M	5.0%	2.96

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Metals Primary Total												
Non-Metallic Mine	NC	HVAC	Air Sealing	5%	5%	0.187	17%	15	0.0001340	L	0.5%	0.28
			Cool Roofs And Exterior Walls	6%	2%	0.233	12%	15	0.0001340	L	0.5%	0.06
			HE (ES) Building Design	6%	2%	0.233	30%	15	0.0001340	L	0.5%	0.71
			HE (ES) Windows And Skylights	3%	5%	0.117	19%	15	0.0001340	L	0.5%	0.16
			HVAC System Commissioning	6%	0%	0.233	10%	5	0.0001340	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.149	12%	15	0.0001340	M	5.0%	3.03
		Lighting	Efficient Lighting Design/Layout	4%	40%	0.154	37%	11	0.0001340	H	12.5%	1.25
			Exterior Light Timers	1%	85%	0.036	30%	15	0.0001340	M	5.0%	6.15
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	0.127	40%	25	0.0001340	H	12.5%	1.83
			Replace Exterior HID with Induction Lighting	0%	2%	0.002	43%	15	0.0001340	L	0.5%	1.71
			Replace Exterior HID with LED Lighting	0%	2%	0.002	60%	15	0.0001340	O	1.8%	1.81
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.038	10%	15	0.0001340	M	5.0%	1.95
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.038	22%	15	0.0001340	H	12.5%	7.36
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.002	22%	15	0.0001340	H	12.5%	7.36
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.002	10%	15	0.0001340	M	5.0%	1.95
			Replace T12 with HP T8/T5	3%	25%	0.122	49%	15	0.0001340	M	5.0%	5.46
	Retrofit	Air Compression	Advanced Air Compression Controls	2%	30%	3.942	4%	15	0.0001340	O	3.5%	0.89
			Advanced Lubricants	0%	5%	0.816	3%	1	0.0001340	L	0.5%	3.51
			Air Compressor System Management	2%	25%	4.638	20%	2	0.0001340	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.710	50%	15	0.0001340	L	0.5%	6.71
			Compressed Air Storage Tank	2%	50%	4.638	2%	15	0.0001340	L	0.5%	8.05
			Compressed Air System Design/Control	2%	80%	4.638	20%	15	0.0001340	L	0.5%	2.24
			Compressed Air System Isolation	2%	20%	4.638	2%	15	0.0001340	O	6.0%	0.89
			Compressed Air System Leak Repair	2%	50%	4.638	10%	2	0.0001340	O	2.0%	3.01
			Cooler Ambient Temperature (-11 Of)	2%	5%	4.638	1%	20	0.0001340	L	0.5%	7.25
			Cycling Air Dryer	1%	25%	1.183	50%	10	0.0001340	L	0.5%	2.36
			Duct In Outside Air To Compressor	2%	10%	3.549	2%	20	0.0001340	L	0.5%	7.25
			Electric Supply System Improvements	2%	10%	4.638	3%	5	0.0001340	M	1.6%	3.88
			Eliminating Wasteful Uses	2%	50%	4.638	1%	5	0.0001340	O	3.0%	2.80
			High Efficiency Air Compress (Upgrade)	2%	60%	3.549	10%	15	0.0001340	O	2.0%	0.22
			Night Shut Off For Compressor	2%	50%	3.710	10%	10	0.0001340	M	1.6%	11.23
			Oil Temperature Control	1%	33%	1.775	2%	10	0.0001340	M	1.6%	1.00
			Process - Swap CA Tools For Electric Ones	2%	70%	4.638	50%	10	0.0001340	L	0.5%	8.99
			Reduce Operating Pressure Of Compressed Air System	2%	50%	4.638	3%	20	0.0001340	O	2.0%	9.06
			Regular Maintenance	2%	50%	4.638	5%	1	0.0001340	O	2.0%	0.37
			Regulated Compressed Air Nozzles	2%	50%	3.942	2%	15	0.0001340	L	0.5%	8.05
			Vacuum Leak Repair	0%	5%	0.019	2%	2	0.0001340	O	2.0%	3.01
			Vacuum System Isolation	0%	5%	0.019	2%	5	0.0001340	O	3.0%	2.80
			VSD For Air Compressor Motors	1%	30%	3.549	10%	15	0.0001340	O	3.0%	2.37

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Non-Metallic Mine	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	6%	50%	12.747	15%	2	0.0001340	M	1.6%	4.29
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	2.040	20%	10	0.0001340	M	1.6%	2.01
			Cool Roofs And Exterior Walls	6%	2%	12.747	12%	15	0.0001340	L	0.5%	0.06
			Energy Management System	6%	10%	12.747	10%	5	0.0001340	M	1.6%	0.82
			HE (ES) Windows And Skylights	3%	5%	6.373	19%	15	0.0001340	L	0.5%	0.16
			HVAC System By-Pass Timer	6%	50%	12.747	5%	5	0.0001340	L	0.5%	2.73
			HVAC System Retrocommissioning*	6%	0%	12.747	10%	5	0.0001340	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	6%	20%	12.747	10%	5	0.0001340	L	0.5%	0.08
			Improve Duct Sealing	6%	15%	12.747	7%	10	0.0001340	M	1.6%	4.21
			Insulate Pipes/Lines	6%	80%	12.747	3%	5	0.0001340	M	1.6%	4.72
			Programmable Thermostat	6%	50%	12.747	4%	5	0.0001340	L	0.5%	6.92
			Thermostat Calibration	6%	10%	12.747	5%	5	0.0001340	L	0.5%	6.92
			Time Clock	6%	10%	12.747	4%	5	0.0001340	L	0.5%	6.92
			Ventilation Controls Installed	5%	5%	10.198	15%	5	0.0001340	L	0.5%	10.59
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	1.275	30%	10	0.0001340	O	3.0%	0.66
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	2%	50%	3.059	30%	15	0.0001340	M	1.6%	5.37
			Chilled Water Reset, Optimizer For Chiller(S)	4%	25%	8.158	5%	15	0.0001340	M	1.6%	0.22
			Chiller Optimization Controls	4%	25%	8.158	5%	15	0.0001340	M	1.6%	1.26
			Chiller, Early Retirement	4%	5%	8.158	5%	15	0.0001340	L	0.5%	0.23
			Cooling Tower Optimization	1%	25%	1.020	5%	5	0.0001340	M	1.6%	0.27
			Economizer (Hydronic Or Outside Air)	1%	2%	2.040	20%	10	0.0001340	M	1.6%	2.13
			Electric Supply System Improvements	4%	10%	8.158	3%	5	0.0001340	L	0.5%	3.99
			Motor System Optimization (Incl. Resizing and Asd)	4%	5%	7.648	6%	10	0.0001340	O	3.0%	0.66
			Ultraviolet A/C Coil Cleaning System	1%	25%	2.040	4%	2	0.0001340	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	4%	40%	8.427	37%	11	0.0001340	M	1.6%	1.25
			Exterior Light Timers	1%	85%	1.983	30%	15	0.0001340	M	1.6%	6.15
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	6.940	40%	25	0.0001340	M	1.6%	1.83
			Replace Exterior HID with Induction Lighting	0%	2%	0.114	43%	15	0.0001340	L	0.5%	0.85
			Replace Exterior HID with LED Lighting	0%	2%	0.114	60%	15	0.0001340	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	0%	50%	2.052	10%	15	0.0001340	O	1.3%	0.55
			Replace High Bay HID with T8 (70% conv)	1%	20%	2.052	22%	15	0.0001340	O	6.0%	3.41
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.114	10%	15	0.0001340	O	1.3%	0.55
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.114	22%	15	0.0001340	O	6.0%	3.41
			Replace T12 with HP T8/T5	3%	25%	6.692	49%	15	0.0001340	O	4.0%	1.73
		Motors	Advanced Lubricants and Drivetrain Maintenance	13%	5%	27.038	3%	1	0.0001340	M	1.6%	9.35
			Fan System Efficiency Improvements	11%	10%	21.160	6%	10	0.0001340	M	1.6%	3.46
			Improved Process Scheduling and Deenergizing Idle Machi	58%	25%	117.555	3%	5	0.0001340	L	0.5%	7.20
			Improved Sensors And Process Controls	18%	40%	35.267	3%	10	0.0001340	M	1.6%	1.05
			Low-Load and Soft Start Technologies (Nola Controllers)	6%	25%	117.555	2%	10	0.0001340	O	1.3%	2.81
			Motor Early Retirement	6%	60%	11.756	5%	10	0.0001340	M	1.6%	3.46
			Motor Optimization / Variable Speed Drives (Process Fans,	14%	60%	27.508	30%	15	0.0001340	O	3.0%	2.88
			Process Rework and Scrap Reduction	58%	25%	117.555	3%	5	0.0001340	L	0.5%	7.20
			Pump System Efficiency Improvements	23%	10%	47.022	16%	10	0.0001340	M	1.6%	3.46
			Trim Existing Pump Impeller To More Closely Match Syster	12%	25%	23.511	2%	5	0.0001340	O	1.5%	0.83
			Use of Energy Efficient Belts and Other Improved Mechanis	15%	40%	117.555	3%	2	0.0001340	O	1.3%	2.91
		Other	Advanced Lubricants	1%	5%	1.843	2%	1	0.0001340	M	1.6%	3.42
			Electric Supply System Improvements	4%	10%	8.015	3%	5	0.0001340	M	1.6%	3.78

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Non-Metallic Mine	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.814	3%	1	0.0001340	H	3.8%	3.51
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001340	M	1.6%	2.01
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1%	50%	2.124	5%	10	0.0001340	M	1.6%	0.40
			Chiller Temperature Reset	4%	50%	7.082	1%	1	0.0001340	M	1.6%	1.03
			Condensate Evaporator	1%	10%	2.656	5%	10	0.0001340	M	1.6%	1.25
			Defrost Control System	2%	25%	3.541	3%	10	0.0001340	M	1.6%	2.81
			Desuperheaters	1%	10%	1.770	5%	10	0.0001340	M	1.6%	4.49
			Economizer For Walk-In Coolers	0%	10%	0.354	10%	10	0.0001340	M	1.6%	0.98
			Electric Supply System Improvements	4%	10%	7.082	3%	5	0.0001340	M	1.6%	3.88
			Evaporate Pre-Cooler	1%	10%	1.770	5%	10	0.0001340	M	1.6%	0.20
			Evaporator Fan Controller	1%	10%	1.770	1%	10	0.0001340	M	1.6%	2.81
			Floating Head Pressure Control	2%	50%	3.541	5%	10	0.0001340	M	1.6%	1.95
			Improved Sensors And Process Controls	1%	40%	2.124	3%	10	0.0001340	M	1.6%	1.50
			Insulated Suction Lines	2%	50%	3.541	1%	5	0.0001340	H	3.8%	0.83
			Liquid Pressure Amplifiers	2%	10%	3.541	5%	5	0.0001340	M	1.6%	1.53
			Refrigeration System Maintenance	4%	25%	7.082	5%	3	0.0001340	M	1.6%	4.67
			Repair Refrigerator/Freezer Leaks	4%	50%	7.082	10%	3	0.0001340	M	1.6%	4.67
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.708	7%	15	0.0001340	M	1.6%	3.10
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.708	4%	15	0.0001340	M	1.6%	2.01
			VSD On Refrigeration Circulating Pump	2%	30%	3.541	30%	15	0.0001340	O	3.0%	2.37
			VSD On Refrigeration Fan	2%	30%	3.541	30%	15	0.0001340	O	3.0%	2.37
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1%	35%	1.643	2%	15	0.0001340	O	3.0%	0.58
			Heat Containment Improvements	5%	70%	10.268	5%	10	0.0001340	M	1.6%	7.25
			Heat Recovery Improvements	20%	70%	41.074	5%	10	0.0001340	M	1.6%	1.02
			Heat Transfer Improvements	5%	70%	10.268	5%	10	0.0001340	M	1.6%	1.02
			Improved Sensors And Process Controls	20%	70%	41.074	8%	10	0.0001340	M	1.6%	1.02
			Load Management (Process Changes)	20%	25%	41.074	2%	10	0.0001340	M	1.6%	3.46
			Timers (Process Heating)	20%	70%	41.074	3%	10	0.0001340	M	1.6%	6.42
			Water Heater Cycling	1%	50%	1.027	2%	10	0.0001340	M	1.6%	6.33
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.226	10%	15	0.0001340	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.151	20%	10	0.0001340	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	1%	33%	0.173	8%	15	0.0001340	L	0.5%	0.49
			HE HVAC System Design	5%	10%	0.866	8%	15	0.0001340	L	0.5%	0.78
			Industrial Air Curtains	1%	80%	0.445	2%	5	0.0001340	M	5.0%	0.43
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.693	12%	15	0.0001340	L	0.5%	3.03
			HE Packaged AC	1%	20%	0.241	25%	10	0.0001340	M	5.0%	3.31
			HE Rooftop Ac Systems	1%	10%	0.241	25%	10	0.0001340	M	5.0%	3.31
			Heat Reclaim Absorption Chillers	0%	1%	0.043	90%	15	0.0001340	L	0.5%	5.18
		Motors	Motor - Nema Premium Efficiency	6%	50%	0.685	2%	25	0.0001340	O	1.0%	1.43
				18%	50%	2.056	2%	25	0.0001340	O	1.0%	1.43
				35%	50%	4.112	2%	25	0.0001340	O	1.0%	1.43
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	6%	10%	9.988	67%	15	0.0001340	L	0.5%	0.55
		Other	Motor - Nema Premium Efficiency	4%	50%	0.467	1%	25	0.0001340	O	1.0%	1.39
			Transformers (Nema Tier Ii)	1%	5%	0.083	2%	30	0.0001340	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	4%	50%	0.838	1%	10	0.0001340	M	5.0%	0.83
			Energy Efficient Equipment	4%	50%	0.484	1%	20	0.0001340	M	5.0%	0.32
			HE Compressors	2%	50%	0.301	8%	15	0.0001340	L	0.5%	1.75
			HE Condensers	2%	50%	0.301	2%	15	0.0001340	L	0.5%	1.75
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	1%	5%	0.122	2%	15	0.0001340	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	1%	5%	0.206	2%	8	0.0001340	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	2%	50%	0.897	15%	5	0.0001340	M	5.0%	2.96

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Non-Metallic Minerals Total												
Other	NC	HVAC	Air Sealing	7%	5%	0.131	17%	15	0.0001569	L	0.5%	0.52
			Cool Roofs And Exterior Walls	9%	2%	0.163	12%	15	0.0001569	L	0.5%	0.06
			HE (ES) Building Design	9%	2%	0.163	30%	15	0.0001569	L	0.5%	0.72
			HE (ES) Windows And Skylights	4%	5%	0.082	19%	15	0.0001569	L	0.5%	0.16
			HVAC System Commissioning	9%	0%	0.163	10%	5	0.0001569	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.068	12%	15	0.0001569	M	5.0%	3.08
		Lighting	Efficient Lighting Design/Layout	5%	40%	0.101	37%	11	0.0001569	H	12.5%	1.27
			Exterior Light Timers	1%	85%	0.024	30%	15	0.0001569	M	5.0%	6.24
			Interior Lighting Timers/Elapsed Time Switching	4%	33%	0.083	40%	25	0.0001569	H	12.5%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.002	43%	15	0.0001569	L	0.5%	1.73
			Replace Exterior HID with LED Lighting	0%	2%	0.002	60%	15	0.0001569	O	1.8%	1.83
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.035	10%	15	0.0001569	M	5.0%	1.98
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.035	22%	15	0.0001569	H	12.5%	7.47
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.002	22%	15	0.0001569	H	12.5%	7.47
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.002	10%	15	0.0001569	M	5.0%	1.98
			Replace T12 with HP T8/T5	4%	25%	0.068	49%	15	0.0001569	M	5.0%	5.54
	Retrofit	Air Compression	Advanced Air Compression Controls	1%	30%	1.267	4%	15	0.0001569	O	3.5%	0.91
			Advanced Lubricants	0%	5%	0.262	3%	1	0.0001569	L	0.5%	3.56
			Air Compressor System Management	1%	25%	1.491	20%	2	0.0001569	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.228	50%	15	0.0001569	L	0.5%	6.81
			Compressed Air Storage Tank	1%	50%	1.491	2%	15	0.0001569	L	0.5%	8.17
			Compressed Air System Design/Control	1%	80%	1.491	20%	15	0.0001569	L	0.5%	2.27
			Compressed Air System Isolation	1%	20%	1.491	2%	15	0.0001569	O	6.0%	0.91
			Compressed Air System Leak Repair	1%	50%	1.491	10%	2	0.0001569	O	2.0%	3.05
			Cooler Ambient Temperature (-11 Of)	1%	5%	1.491	1%	20	0.0001569	L	0.5%	7.36
			Cycling Air Dryer	0%	25%	0.380	50%	10	0.0001569	L	0.5%	2.40
			Duct In Outside Air To Compressor	1%	10%	1.141	2%	20	0.0001569	L	0.5%	7.36
			Electric Supply System Improvements	1%	10%	1.491	3%	5	0.0001569	M	1.6%	3.93
			Eliminating Wasteful Uses	1%	50%	1.491	1%	5	0.0001569	O	3.0%	2.84
			High Efficiency Air Compress (Upgrade)	1%	60%	1.141	10%	15	0.0001569	O	2.0%	0.22
			Night Shut Off For Compressor	1%	50%	1.193	10%	10	0.0001569	M	1.6%	11.40
			Oil Temperature Control	1%	33%	0.571	2%	10	0.0001569	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	1%	70%	1.491	50%	10	0.0001569	L	0.5%	9.12
			Reduce Operating Pressure Of Compressed Air System	1%	50%	1.491	3%	20	0.0001569	O	2.0%	9.20
			Regular Maintenance	1%	50%	1.491	5%	1	0.0001569	O	2.0%	0.38
			Regulated Compressed Air Nozzles	1%	50%	1.267	2%	15	0.0001569	L	0.5%	8.17
			Vacuum Leak Repair	0%	5%	0.006	2%	2	0.0001569	O	2.0%	3.05
			Vacuum System Isolation	0%	5%	0.006	2%	5	0.0001569	O	3.0%	2.84
			VSD For Air Compressor Motors	1%	30%	1.141	10%	15	0.0001569	O	3.0%	2.40

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	9%	50%	8.927	15%	2	0.0001569	M	1.6%	4.36
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	1.428	20%	10	0.0001569	M	1.6%	2.05
			Cool Roofs And Exterior Walls	9%	2%	8.927	12%	15	0.0001569	L	0.5%	0.06
			Energy Management System	9%	10%	8.927	10%	5	0.0001569	M	1.6%	0.84
			HE (ES) Windows And Skylights	4%	5%	4.463	19%	15	0.0001569	L	0.5%	0.16
			HVAC System By-Pass Timer	9%	50%	8.927	5%	5	0.0001569	L	0.5%	2.78
			HVAC System Retrocommissioning*	9%	0%	8.927	10%	5	0.0001569	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	9%	20%	8.927	10%	5	0.0001569	L	0.5%	0.08
			Improve Duct Sealing	9%	15%	8.927	7%	10	0.0001569	M	1.6%	4.28
			Insulate Pipes/Lines	9%	80%	8.927	3%	5	0.0001569	M	1.6%	4.80
			Programmable Thermostat	9%	50%	8.927	4%	5	0.0001569	L	0.5%	7.05
			Thermostat Calibration	9%	10%	8.927	5%	5	0.0001569	L	0.5%	7.05
			Time Clock	9%	10%	8.927	4%	5	0.0001569	L	0.5%	7.05
			Ventilation Controls Installed	7%	5%	7.141	15%	5	0.0001569	L	0.5%	10.78
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	0.893	30%	10	0.0001569	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	1.384	30%	15	0.0001569	M	1.6%	5.46
			Chilled Water Reset, Optimizer For Chiller(S)	4%	25%	3.692	5%	15	0.0001569	M	1.6%	0.22
			Chiller Optimization Controls	4%	25%	3.692	5%	15	0.0001569	M	1.6%	1.28
			Chiller, Early Retirement	4%	5%	3.692	5%	15	0.0001569	L	0.5%	0.24
			Cooling Tower Optimization	0%	25%	0.461	5%	5	0.0001569	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	1%	2%	0.923	20%	10	0.0001569	M	1.6%	2.17
			Electric Supply System Improvements	4%	10%	3.692	3%	5	0.0001569	L	0.5%	4.06
			Motor System Optimization (Incl. Resizing and Asd)	3%	5%	3.461	6%	10	0.0001569	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	1%	25%	0.923	4%	2	0.0001569	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	5%	40%	5.518	37%	11	0.0001569	M	1.6%	1.27
			Exterior Light Timers	1%	85%	1.298	30%	15	0.0001569	M	1.6%	6.24
			Interior Lighting Timers/Elapsed Time Switching	4%	33%	4.544	40%	25	0.0001569	M	1.6%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.107	43%	15	0.0001569	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.107	60%	15	0.0001569	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	1%	50%	1.928	10%	15	0.0001569	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	1%	20%	1.928	22%	15	0.0001569	O	6.0%	3.46
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.107	10%	15	0.0001569	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.107	22%	15	0.0001569	O	6.0%	3.46
			Replace T12 with HP T8/T5	4%	25%	3.739	49%	15	0.0001569	O	4.0%	1.75
		Motors	Advanced Lubricants and Drivetrain Maintenance	12%	5%	12.365	3%	1	0.0001569	M	1.6%	9.49
			Fan System Efficiency Improvements	10%	10%	9.677	6%	10	0.0001569	M	1.6%	3.51
			Improved Process Scheduling and Deenergizing Idle Machi	53%	25%	53.763	3%	5	0.0001569	L	0.5%	7.31
			Improved Sensors And Process Controls	16%	40%	16.129	3%	10	0.0001569	M	1.6%	1.06
			Low-Load and Soft Start Technologies (Nola Controllers)	5%	25%	53.763	2%	10	0.0001569	O	1.3%	2.85
			Motor Early Retirement	11%	60%	10.753	5%	10	0.0001569	M	1.6%	3.51
			Motor Optimization / Variable Speed Drives (Process Fans,	15%	60%	15.591	30%	15	0.0001569	O	3.0%	2.92
			Process Rework and Scrap Reduction	53%	25%	53.763	3%	5	0.0001569	L	0.5%	7.31
			Pump System Efficiency Improvements	16%	10%	16.129	16%	10	0.0001569	M	1.6%	3.51
			Trim Existing Pump Impeller To More Closely Match Syster	8%	25%	8.064	2%	5	0.0001569	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	13%	40%	53.763	3%	2	0.0001569	O	1.3%	2.95
		Other	Advanced Lubricants	3%	5%	2.963	2%	1	0.0001569	M	1.6%	3.47
			Electric Supply System Improvements	13%	10%	12.883	3%	5	0.0001569	M	1.6%	3.84

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other	Retrofit	Process Cooling	Advanced Lubricants	1%	5%	0.758	3%	1	0.0001569	H	3.8%	3.56
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001569	M	1.6%	2.04
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	2%	50%	1.978	5%	10	0.0001569	M	1.6%	0.41
			Chiller Temperature Reset	7%	50%	6.594	1%	1	0.0001569	M	1.6%	1.04
			Condensate Evaporator	2%	10%	2.473	5%	10	0.0001569	M	1.6%	1.27
			Defrost Control System	3%	25%	3.297	3%	10	0.0001569	M	1.6%	2.85
			Desuperheaters	2%	10%	1.648	5%	10	0.0001569	M	1.6%	4.56
			Economizer For Walk-In Coolers	0%	10%	0.330	10%	10	0.0001569	M	1.6%	0.99
			Electric Supply System Improvements	7%	10%	6.594	3%	5	0.0001569	M	1.6%	3.93
			Evaporate Pre-Cooler	2%	10%	1.648	5%	10	0.0001569	M	1.6%	0.21
			Evaporator Fan Controller	2%	10%	1.648	1%	10	0.0001569	M	1.6%	2.85
			Floating Head Pressure Control	3%	50%	3.297	5%	10	0.0001569	M	1.6%	1.98
			Improved Sensors And Process Controls	2%	40%	1.978	3%	10	0.0001569	M	1.6%	1.52
			Insulated Suction Lines	3%	50%	3.297	1%	5	0.0001569	H	3.8%	0.84
			Liquid Pressure Amplifiers	3%	10%	3.297	5%	5	0.0001569	M	1.6%	1.55
			Refrigeration System Maintenance	7%	25%	6.594	5%	3	0.0001569	M	1.6%	4.74
			Repair Refrigerator/Freezer Leaks	7%	50%	6.594	10%	3	0.0001569	M	1.6%	4.74
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	1%	0%	0.659	7%	15	0.0001569	M	1.6%	3.14
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	1%	0%	0.659	4%	15	0.0001569	M	1.6%	2.04
			VSD On Refrigeration Circulating Pump	3%	30%	3.297	30%	15	0.0001569	O	3.0%	2.40
			VSD On Refrigeration Fan	3%	30%	3.297	30%	15	0.0001569	O	3.0%	2.40
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.219	2%	15	0.0001569	O	3.0%	0.59
			Heat Containment Improvements	3%	70%	2.739	5%	10	0.0001569	M	1.6%	7.36
			Heat Recovery Improvements	11%	70%	10.955	5%	10	0.0001569	M	1.6%	1.04
			Heat Transfer Improvements	3%	70%	2.739	5%	10	0.0001569	M	1.6%	1.04
			Improved Sensors And Process Controls	11%	70%	10.955	8%	10	0.0001569	M	1.6%	1.04
			Load Management (Process Changes)	11%	25%	10.955	2%	10	0.0001569	M	1.6%	3.51
			Timers (Process Heating)	11%	70%	10.955	3%	10	0.0001569	M	1.6%	6.51
			Water Heater Cycling	0%	50%	0.137	2%	10	0.0001569	M	1.6%	6.42
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.073	10%	15	0.0001569	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.106	20%	10	0.0001569	M	5.0%	0.64
			HE Heat Pumps, Including Geothermal	1%	33%	0.121	8%	15	0.0001569	L	0.5%	0.50
			HE HVAC System Design	7%	10%	0.607	8%	15	0.0001569	L	0.5%	0.79
			Industrial Air Curtains	1%	80%	0.312	2%	5	0.0001569	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.314	12%	15	0.0001569	L	0.5%	3.08
			HE Packaged AC	1%	20%	0.109	25%	10	0.0001569	M	5.0%	3.37
			HE Rooftop Ac Systems	1%	10%	0.109	25%	10	0.0001569	M	5.0%	3.37
			Heat Reclaim Absorption Chillers	0%	1%	0.020	90%	15	0.0001569	L	0.5%	5.28
		Motors	Motor - Nema Premium Efficiency	11%	50%	0.627	2%	25	0.0001569	O	1.0%	1.45
				16%	50%	0.940	2%	25	0.0001569	O	1.0%	1.45
				27%	50%	1.567	2%	25	0.0001569	O	1.0%	1.45
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	5%	10%	4.568	67%	15	0.0001569	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	13%	50%	0.751	1%	25	0.0001569	O	1.0%	1.41
			Transformers (Nema Tier Ii)	3%	5%	0.133	2%	30	0.0001569	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	7%	50%	0.780	1%	10	0.0001569	M	5.0%	0.84
			Energy Efficient Equipment	7%	50%	0.450	1%	20	0.0001569	M	5.0%	0.33
			HE Compressors	3%	50%	0.280	8%	15	0.0001569	L	0.5%	1.78
			HE Condensers	3%	50%	0.280	2%	15	0.0001569	L	0.5%	1.78
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.016	2%	15	0.0001569	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.027	2%	8	0.0001569	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	1%	50%	0.120	15%	5	0.0001569	M	5.0%	3.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Other Total												
Plastics and Rubb	NC	HVAC	Air Sealing	8%	5%	0.072	17%	15	0.0001377	L	0.5%	0.22
			Cool Roofs And Exterior Walls	10%	2%	0.090	12%	15	0.0001377	L	0.5%	0.06
			HE (ES) Building Design	10%	2%	0.090	30%	15	0.0001377	L	0.5%	0.71
			HE (ES) Windows And Skylights	5%	5%	0.045	19%	15	0.0001377	L	0.5%	0.16
			HVAC System Commissioning	10%	0%	0.090	10%	5	0.0001377	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.037	12%	15	0.0001377	M	5.0%	3.04
		Lighting	Efficient Lighting Design/Layout	7%	40%	0.060	37%	11	0.0001377	H	12.5%	1.25
			Exterior Light Timers	2%	85%	0.014	30%	15	0.0001377	M	5.0%	6.16
			Interior Lighting Timers/Elapsed Time Switching	6%	33%	0.050	40%	25	0.0001377	H	12.5%	1.84
			Replace Exterior HID with Induction Lighting	0%	2%	0.001	43%	15	0.0001377	L	0.5%	1.71
			Replace Exterior HID with LED Lighting	0%	2%	0.001	60%	15	0.0001377	O	1.8%	1.81
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.015	10%	15	0.0001377	M	5.0%	1.96
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.015	22%	15	0.0001377	H	12.5%	7.39
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.001	22%	15	0.0001377	H	12.5%	7.39
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.001	10%	15	0.0001377	M	5.0%	1.96
			Replace T12 with HP T8/T5	5%	25%	0.048	49%	15	0.0001377	M	5.0%	5.48
	Retrofit	Air Compression	Advanced Air Compression Controls	2%	30%	0.959	4%	15	0.0001377	O	3.5%	0.90
			Advanced Lubricants	0%	5%	0.199	3%	1	0.0001377	L	0.5%	3.51
			Air Compressor System Management	2%	25%	1.129	20%	2	0.0001377	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.173	50%	15	0.0001377	L	0.5%	6.73
			Compressed Air Storage Tank	2%	50%	1.129	2%	15	0.0001377	L	0.5%	8.07
			Compressed Air System Design/Control	2%	80%	1.129	20%	15	0.0001377	L	0.5%	2.24
			Compressed Air System Isolation	2%	20%	1.129	2%	15	0.0001377	O	6.0%	0.90
			Compressed Air System Leak Repair	2%	50%	1.129	10%	2	0.0001377	O	2.0%	3.01
			Cooler Ambient Temperature (-11 Of)	2%	5%	1.129	1%	20	0.0001377	L	0.5%	7.27
			Cycling Air Dryer	1%	25%	0.288	50%	10	0.0001377	L	0.5%	2.37
			Duct In Outside Air To Compressor	2%	10%	0.864	2%	20	0.0001377	L	0.5%	7.27
			Electric Supply System Improvements	2%	10%	1.129	3%	5	0.0001377	M	1.6%	3.89
			Eliminating Wasteful Uses	2%	50%	1.129	1%	5	0.0001377	O	3.0%	2.81
			High Efficiency Air Compress (Upgrade)	2%	60%	0.864	10%	15	0.0001377	O	2.0%	0.22
			Night Shut Off For Compressor	2%	50%	0.903	10%	10	0.0001377	M	1.6%	11.26
			Oil Temperature Control	1%	33%	0.432	2%	10	0.0001377	M	1.6%	1.00
			Process - Swap CA Tools For Electric Ones	2%	70%	1.129	50%	10	0.0001377	L	0.5%	9.01
			Reduce Operating Pressure Of Compressed Air System	2%	50%	1.129	3%	20	0.0001377	O	2.0%	9.09
			Regular Maintenance	2%	50%	1.129	5%	1	0.0001377	O	2.0%	0.38
			Regulated Compressed Air Nozzles	2%	50%	0.959	2%	15	0.0001377	L	0.5%	8.07
			Vacuum Leak Repair	0%	5%	0.005	2%	2	0.0001377	O	2.0%	3.01
			Vacuum System Isolation	0%	5%	0.005	2%	5	0.0001377	O	3.0%	2.81
			VSD For Air Compressor Motors	1%	30%	0.864	10%	15	0.0001377	O	3.0%	2.37

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Plastics and Rubb	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	10%	50%	4.895	15%	2	0.0001377	M	1.6%	4.30
			Controls Of Paint Or Spray Booth Exhaust/Supply System	2%	50%	0.783	20%	10	0.0001377	M	1.6%	2.02
			Cool Roofs And Exterior Walls	10%	2%	4.895	12%	15	0.0001377	L	0.5%	0.06
			Energy Management System	10%	10%	4.895	10%	5	0.0001377	M	1.6%	0.83
			HE (ES) Windows And Skylights	5%	5%	2.448	19%	15	0.0001377	L	0.5%	0.16
			HVAC System By-Pass Timer	10%	50%	4.895	5%	5	0.0001377	L	0.5%	2.74
			HVAC System Retrocommissioning*	10%	0%	4.895	10%	5	0.0001377	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	10%	20%	4.895	10%	5	0.0001377	L	0.5%	0.08
			Improve Duct Sealing	10%	15%	4.895	7%	10	0.0001377	M	1.6%	4.22
			Insulate Pipes/Lines	10%	80%	4.895	3%	5	0.0001377	M	1.6%	4.73
			Programmable Thermostat	10%	50%	4.895	4%	5	0.0001377	L	0.5%	6.94
			Thermostat Calibration	10%	10%	4.895	5%	5	0.0001377	L	0.5%	6.94
			Time Clock	10%	10%	4.895	4%	5	0.0001377	L	0.5%	6.94
			Ventilation Controls Installed	8%	5%	3.916	15%	5	0.0001377	L	0.5%	10.62
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	0.490	30%	10	0.0001377	O	3.0%	0.66
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	2%	50%	0.763	30%	15	0.0001377	M	1.6%	5.38
			Chilled Water Reset, Optimizer For Chiller(S)	4%	25%	2.034	5%	15	0.0001377	M	1.6%	0.22
			Chiller Optimization Controls	4%	25%	2.034	5%	15	0.0001377	M	1.6%	1.26
			Chiller, Early Retirement	4%	5%	2.034	5%	15	0.0001377	L	0.5%	0.23
			Cooling Tower Optimization	1%	25%	0.254	5%	5	0.0001377	M	1.6%	0.27
			Economizer (Hydronic Or Outside Air)	1%	2%	0.509	20%	10	0.0001377	M	1.6%	2.14
			Electric Supply System Improvements	4%	10%	2.034	3%	5	0.0001377	L	0.5%	4.00
			Motor System Optimization (Incl. Resizing and Asd)	4%	5%	1.907	6%	10	0.0001377	O	3.0%	0.66
			Ultraviolet A/C Coil Cleaning System	1%	25%	0.509	4%	2	0.0001377	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	7%	40%	3.304	37%	11	0.0001377	M	1.6%	1.25
			Exterior Light Timers	2%	85%	0.777	30%	15	0.0001377	M	1.6%	6.16
			Interior Lighting Timers/Elapsed Time Switching	6%	33%	2.721	40%	25	0.0001377	M	1.6%	1.84
			Replace Exterior HID with Induction Lighting	0%	2%	0.045	43%	15	0.0001377	L	0.5%	0.85
			Replace Exterior HID with LED Lighting	0%	2%	0.045	60%	15	0.0001377	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.805	10%	15	0.0001377	O	1.3%	0.55
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.805	22%	15	0.0001377	O	6.0%	3.42
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.045	10%	15	0.0001377	O	1.3%	0.55
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.045	22%	15	0.0001377	O	6.0%	3.42
			Replace T12 with HP T8/T5	5%	25%	2.624	49%	15	0.0001377	O	4.0%	1.73
		Motors	Advanced Lubricants and Drivetrain Maintenance	12%	5%	5.939	3%	1	0.0001377	M	1.6%	9.37
			Fan System Efficiency Improvements	10%	10%	4.648	6%	10	0.0001377	M	1.6%	3.46
			Improved Process Scheduling and Deenergizing Idle Machi	54%	25%	25.820	3%	5	0.0001377	L	0.5%	7.22
			Improved Sensors And Process Controls	16%	40%	7.746	3%	10	0.0001377	M	1.6%	1.05
			Low-Load and Soft Start Technologies (Nola Controllers)	5%	25%	25.820	2%	10	0.0001377	O	1.3%	2.82
			Motor Early Retirement	5%	60%	2.582	5%	10	0.0001377	M	1.6%	3.46
			Motor Optimization / Variable Speed Drives (Process Fans,	16%	60%	7.488	30%	15	0.0001377	O	3.0%	2.88
			Process Rework and Scrap Reduction	54%	25%	25.820	3%	5	0.0001377	L	0.5%	7.22
			Pump System Efficiency Improvements	22%	10%	10.328	16%	10	0.0001377	M	1.6%	3.46
			Trim Existing Pump Impeller To More Closely Match Syster	11%	25%	5.164	2%	5	0.0001377	O	1.5%	0.83
			Use of Energy Efficient Belts and Other Improved Mechanis	13%	40%	25.820	3%	2	0.0001377	O	1.3%	2.92
		Other	Advanced Lubricants	0%	5%	0.166	2%	1	0.0001377	M	1.6%	3.43
			Electric Supply System Improvements	2%	10%	0.720	3%	5	0.0001377	M	1.6%	3.79

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Plastics and Rubb	Retrofit	Process Cooling	Advanced Lubricants	1%	5%	0.458	3%	1	0.0001377	H	3.8%	3.51
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001377	M	1.6%	2.02
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	2%	50%	1.195	5%	10	0.0001377	M	1.6%	0.40
			Chiller Temperature Reset	8%	50%	3.983	1%	1	0.0001377	M	1.6%	1.03
			Condensate Evaporator	3%	10%	1.494	5%	10	0.0001377	M	1.6%	1.25
			Defrost Control System	4%	25%	1.992	3%	10	0.0001377	M	1.6%	2.82
			Desuperheaters	2%	10%	0.996	5%	10	0.0001377	M	1.6%	4.50
			Economizer For Walk-In Coolers	0%	10%	0.199	10%	10	0.0001377	M	1.6%	0.98
			Electric Supply System Improvements	8%	10%	3.983	3%	5	0.0001377	M	1.6%	3.89
			Evaporate Pre-Cooler	2%	10%	0.996	5%	10	0.0001377	M	1.6%	0.20
			Evaporator Fan Controller	2%	10%	0.996	1%	10	0.0001377	M	1.6%	2.82
			Floating Head Pressure Control	4%	50%	1.992	5%	10	0.0001377	M	1.6%	1.96
			Improved Sensors And Process Controls	2%	40%	1.195	3%	10	0.0001377	M	1.6%	1.50
			Insulated Suction Lines	4%	50%	1.992	1%	5	0.0001377	H	3.8%	0.83
			Liquid Pressure Amplifiers	4%	10%	1.992	5%	5	0.0001377	M	1.6%	1.53
			Refrigeration System Maintenance	8%	25%	3.983	5%	3	0.0001377	M	1.6%	4.69
			Repair Refrigerator/Freezer Leaks	8%	50%	3.983	10%	3	0.0001377	M	1.6%	4.69
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	1%	0%	0.398	7%	15	0.0001377	M	1.6%	3.10
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	1%	0%	0.398	4%	15	0.0001377	M	1.6%	2.02
			VSD On Refrigeration Circulating Pump	4%	30%	1.992	30%	15	0.0001377	O	3.0%	2.37
			VSD On Refrigeration Fan	4%	30%	1.992	30%	15	0.0001377	O	3.0%	2.37
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	1%	35%	0.296	2%	15	0.0001377	O	3.0%	0.58
			Heat Containment Improvements	4%	70%	1.848	5%	10	0.0001377	M	1.6%	7.26
			Heat Recovery Improvements	15%	70%	7.391	5%	10	0.0001377	M	1.6%	1.02
			Heat Transfer Improvements	4%	70%	1.848	5%	10	0.0001377	M	1.6%	1.02
			Improved Sensors And Process Controls	15%	70%	7.391	8%	10	0.0001377	M	1.6%	1.02
			Load Management (Process Changes)	15%	25%	7.391	2%	10	0.0001377	M	1.6%	3.46
			Timers (Process Heating)	15%	70%	7.391	3%	10	0.0001377	M	1.6%	6.43
			Water Heater Cycling	0%	50%	0.185	2%	10	0.0001377	M	1.6%	6.34
	ROB	Air Compression	Variable Displacement Compressor	1%	30%	0.055	10%	15	0.0001377	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.058	20%	10	0.0001377	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	2%	33%	0.067	8%	15	0.0001377	L	0.5%	0.50
			HE HVAC System Design	8%	10%	0.333	8%	15	0.0001377	L	0.5%	0.78
			Industrial Air Curtains	2%	80%	0.171	2%	5	0.0001377	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	4%	10%	0.173	12%	15	0.0001377	L	0.5%	3.04
			HE Packaged AC	1%	20%	0.060	25%	10	0.0001377	M	5.0%	3.32
			HE Rooftop Ac Systems	1%	10%	0.060	25%	10	0.0001377	M	5.0%	3.32
			Heat Reclaim Absorption Chillers	0%	1%	0.011	90%	15	0.0001377	L	0.5%	5.20
		Motors	Motor - Nema Premium Efficiency	5%	50%	0.151	2%	25	0.0001377	O	1.0%	1.43
				16%	50%	0.452	2%	25	0.0001377	O	1.0%	1.43
				32%	50%	0.903	2%	25	0.0001377	O	1.0%	1.43
			Replace Hydraulic or Inefficient Machine with Efficient, Eeld	5%	10%	2.194	67%	15	0.0001377	L	0.5%	0.55
		Other	Motor - Nema Premium Efficiency	2%	50%	0.042	1%	25	0.0001377	O	1.0%	1.39
			Transformers (Nema Tier Ii)	0%	5%	0.007	2%	30	0.0001377	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	8%	50%	0.471	1%	10	0.0001377	M	5.0%	0.83
			Energy Efficient Equipment	8%	50%	0.272	1%	20	0.0001377	M	5.0%	0.32
			HE Compressors	4%	50%	0.169	8%	15	0.0001377	L	0.5%	1.75
			HE Condensers	4%	50%	0.169	2%	15	0.0001377	L	0.5%	1.75
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	1%	5%	0.022	2%	15	0.0001377	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	1%	5%	0.037	2%	8	0.0001377	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	2%	50%	0.161	15%	5	0.0001377	M	5.0%	2.97

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Plastics and Rubber Total												
Pulp and Paper	NC	HVAC	Air Sealing	6%	5%	0.127	17%	15	0.0001284	L	0.5%	0.12
			Cool Roofs And Exterior Walls	7%	2%	0.159	12%	15	0.0001284	L	0.5%	0.06
			HE (ES) Building Design	7%	2%	0.159	30%	15	0.0001284	L	0.5%	0.71
			HE (ES) Windows And Skylights	4%	5%	0.080	19%	15	0.0001284	L	0.5%	0.16
			HVAC System Commissioning	7%	0%	0.159	10%	5	0.0001284	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2%	10%	0.040	12%	15	0.0001284	M	5.0%	3.01
		Lighting	Efficient Lighting Design/Layout	3%	40%	0.075	37%	11	0.0001284	H	12.5%	1.25
			Exterior Light Timers	1%	85%	0.018	30%	15	0.0001284	M	5.0%	6.12
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	0.062	40%	25	0.0001284	H	12.5%	1.83
			Replace Exterior HID with Induction Lighting	0%	2%	0.001	43%	15	0.0001284	L	0.5%	1.70
			Replace Exterior HID with LED Lighting	0%	2%	0.001	60%	15	0.0001284	O	1.8%	1.80
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.026	10%	15	0.0001284	M	5.0%	1.95
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.026	22%	15	0.0001284	H	12.5%	7.34
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.001	22%	15	0.0001284	H	12.5%	7.34
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.001	10%	15	0.0001284	M	5.0%	1.95
			Replace T12 with HP T8/T5	2%	25%	0.053	49%	15	0.0001284	M	5.0%	5.45
	Retrofit	Air Compression	Advanced Air Compression Controls	1%	30%	0.724	4%	15	0.0001284	O	3.5%	0.89
			Advanced Lubricants	0%	5%	0.150	3%	1	0.0001284	L	0.5%	3.49
			Air Compressor System Management	1%	25%	0.852	20%	2	0.0001284	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.130	50%	15	0.0001284	L	0.5%	6.69
			Compressed Air Storage Tank	1%	50%	0.852	2%	15	0.0001284	L	0.5%	8.02
			Compressed Air System Design/Control	1%	80%	0.852	20%	15	0.0001284	L	0.5%	2.23
			Compressed Air System Isolation	1%	20%	0.852	2%	15	0.0001284	O	6.0%	0.89
			Compressed Air System Leak Repair	1%	50%	0.852	10%	2	0.0001284	O	2.0%	2.99
			Cooler Ambient Temperature (-11 Of)	1%	5%	0.852	1%	20	0.0001284	L	0.5%	7.23
			Cycling Air Dryer	0%	25%	0.217	50%	10	0.0001284	L	0.5%	2.36
			Duct In Outside Air To Compressor	1%	10%	0.652	2%	20	0.0001284	L	0.5%	7.23
			Electric Supply System Improvements	1%	10%	0.852	3%	5	0.0001284	M	1.6%	3.86
			Eliminating Wasteful Uses	1%	50%	0.852	1%	5	0.0001284	O	3.0%	2.79
			High Efficiency Air Compress (Upgrade)	1%	60%	0.652	10%	15	0.0001284	O	2.0%	0.22
			Night Shut Off For Compressor	1%	50%	0.681	10%	10	0.0001284	M	1.6%	11.19
			Oil Temperature Control	0%	33%	0.326	2%	10	0.0001284	M	1.6%	0.99
			Process - Swap CA Tools For Electric Ones	1%	70%	0.852	50%	10	0.0001284	L	0.5%	8.95
			Reduce Operating Pressure Of Compressed Air System	1%	50%	0.852	3%	20	0.0001284	O	2.0%	9.03
			Regular Maintenance	1%	50%	0.852	5%	1	0.0001284	O	2.0%	0.37
			Regulated Compressed Air Nozzles	1%	50%	0.724	2%	15	0.0001284	L	0.5%	8.02
			Vacuum Leak Repair	0%	5%	0.003	2%	2	0.0001284	O	2.0%	2.99
			Vacuum System Isolation	0%	5%	0.003	2%	5	0.0001284	O	3.0%	2.79
			VSD For Air Compressor Motors	0%	30%	0.652	10%	15	0.0001284	O	3.0%	2.36

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Pulp and Paper	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	7%	50%	8.693	15%	2	0.0001284	M	1.6%	4.27
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	1.391	20%	10	0.0001284	M	1.6%	2.00
			Cool Roofs And Exterior Walls	7%	2%	8.693	12%	15	0.0001284	L	0.5%	0.06
			Energy Management System	7%	10%	8.693	10%	5	0.0001284	M	1.6%	0.82
			HE (ES) Windows And Skylights	4%	5%	4.346	19%	15	0.0001284	L	0.5%	0.16
			HVAC System By-Pass Timer	7%	50%	8.693	5%	5	0.0001284	L	0.5%	2.72
			HVAC System Retrocommissioning*	7%	0%	8.693	10%	5	0.0001284	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	7%	20%	8.693	10%	5	0.0001284	L	0.5%	0.08
			Improve Duct Sealing	7%	15%	8.693	7%	10	0.0001284	M	1.6%	4.19
			Insulate Pipes/Lines	7%	80%	8.693	3%	5	0.0001284	M	1.6%	4.70
			Programmable Thermostat	7%	50%	8.693	4%	5	0.0001284	L	0.5%	6.89
			Thermostat Calibration	7%	10%	8.693	5%	5	0.0001284	L	0.5%	6.89
			Time Clock	7%	10%	8.693	4%	5	0.0001284	L	0.5%	6.89
			Ventilation Controls Installed	6%	5%	6.954	15%	5	0.0001284	L	0.5%	10.54
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	0.869	30%	10	0.0001284	O	3.0%	0.66
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	0.817	30%	15	0.0001284	M	1.6%	5.34
			Chilled Water Reset, Optimizer For Chiller(S)	2%	25%	2.180	5%	15	0.0001284	M	1.6%	0.22
			Chiller Optimization Controls	2%	25%	2.180	5%	15	0.0001284	M	1.6%	1.25
			Chiller, Early Retirement	2%	5%	2.180	5%	15	0.0001284	L	0.5%	0.23
			Cooling Tower Optimization	0%	25%	0.272	5%	5	0.0001284	M	1.6%	0.27
			Economizer (Hydronic Or Outside Air)	0%	2%	0.545	20%	10	0.0001284	M	1.6%	2.12
			Electric Supply System Improvements	2%	10%	2.180	3%	5	0.0001284	L	0.5%	3.97
			Motor System Optimization (Incl. Resizing and Asd)	2%	5%	2.044	6%	10	0.0001284	O	3.0%	0.66
			Ultraviolet A/C Coil Cleaning System	0%	25%	0.545	4%	2	0.0001284	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	3%	40%	4.117	37%	11	0.0001284	M	1.6%	1.25
			Exterior Light Timers	1%	85%	0.969	30%	15	0.0001284	M	1.6%	6.12
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	3.390	40%	25	0.0001284	M	1.6%	1.83
			Replace Exterior HID with Induction Lighting	0%	2%	0.077	43%	15	0.0001284	L	0.5%	0.84
			Replace Exterior HID with LED Lighting	0%	2%	0.077	60%	15	0.0001284	O	1.8%	0.43
			Replace High Bay HID with PSMH (30% conv)	0%	50%	1.395	10%	15	0.0001284	O	1.3%	0.55
			Replace High Bay HID with T8 (70% conv)	1%	20%	1.395	22%	15	0.0001284	O	6.0%	3.40
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.077	10%	15	0.0001284	O	1.3%	0.55
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.077	22%	15	0.0001284	O	6.0%	3.40
			Replace T12 with HP T8/T5	2%	25%	2.877	49%	15	0.0001284	O	4.0%	1.72
		Motors	Advanced Lubricants and Drivetrain Maintenance	19%	5%	23.077	3%	1	0.0001284	M	1.6%	9.31
			Fan System Efficiency Improvements	18%	10%	22.074	6%	10	0.0001284	M	1.6%	3.44
			Improved Process Scheduling and Deenergizing Idle Machi	81%	25%	100.336	3%	5	0.0001284	L	0.5%	7.17
			Improved Sensors And Process Controls	24%	40%	30.101	3%	10	0.0001284	M	1.6%	1.04
			Low-Load and Soft Start Technologies (Nola Controllers)	8%	25%	100.336	2%	10	0.0001284	O	1.3%	2.80
			Motor Early Retirement	14%	60%	17.057	5%	10	0.0001284	M	1.6%	3.44
			Motor Optimization / Variable Speed Drives (Process Fans,	40%	60%	50.168	30%	15	0.0001284	O	3.0%	2.87
			Process Rework and Scrap Reduction	81%	25%	100.336	3%	5	0.0001284	L	0.5%	7.17
			Pump System Efficiency Improvements	28%	10%	35.118	16%	10	0.0001284	M	1.6%	3.44
			Trim Existing Pump Impeller To More Closely Match Syster	14%	25%	17.559	2%	5	0.0001284	O	1.5%	0.82
			Use of Energy Efficient Belts and Other Improved Mechanis	20%	40%	100.336	3%	2	0.0001284	O	1.3%	2.90
		Other	Advanced Lubricants	1%	5%	1.028	2%	1	0.0001284	M	1.6%	3.41
			Electric Supply System Improvements	4%	10%	4.470	3%	5	0.0001284	M	1.6%	3.76

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Pulp and Paper	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.214	3%	1	0.0001284	H	3.8%	3.49
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001284	M	1.6%	2.01
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0%	50%	0.559	5%	10	0.0001284	M	1.6%	0.40
			Chiller Temperature Reset	2%	50%	1.863	1%	1	0.0001284	M	1.6%	1.02
			Condensate Evaporator	1%	10%	0.699	5%	10	0.0001284	M	1.6%	1.24
			Defrost Control System	1%	25%	0.931	3%	10	0.0001284	M	1.6%	2.80
			Desuperheaters	0%	10%	0.466	5%	10	0.0001284	M	1.6%	4.48
			Economizer For Walk-In Coolers	0%	10%	0.093	10%	10	0.0001284	M	1.6%	0.97
			Electric Supply System Improvements	2%	10%	1.863	3%	5	0.0001284	M	1.6%	3.86
			Evaporate Pre-Cooler	0%	10%	0.466	5%	10	0.0001284	M	1.6%	0.20
			Evaporator Fan Controller	0%	10%	0.466	1%	10	0.0001284	M	1.6%	2.80
			Floating Head Pressure Control	1%	50%	0.931	5%	10	0.0001284	M	1.6%	1.95
			Improved Sensors And Process Controls	0%	40%	0.559	3%	10	0.0001284	M	1.6%	1.49
			Insulated Suction Lines	1%	50%	0.931	1%	5	0.0001284	H	3.8%	0.82
			Liquid Pressure Amplifiers	1%	10%	0.931	5%	5	0.0001284	M	1.6%	1.52
			Refrigeration System Maintenance	2%	25%	1.863	5%	3	0.0001284	M	1.6%	4.66
			Repair Refrigerator/Freezer Leaks	2%	50%	1.863	10%	3	0.0001284	M	1.6%	4.66
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.186	7%	15	0.0001284	M	1.6%	3.09
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.186	4%	15	0.0001284	M	1.6%	2.01
			VSD On Refrigeration Circulating Pump	1%	30%	0.931	30%	15	0.0001284	O	3.0%	2.36
			VSD On Refrigeration Fan	1%	30%	0.931	30%	15	0.0001284	O	3.0%	2.36
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.310	2%	15	0.0001284	O	3.0%	0.58
			Heat Containment Improvements	1%	70%	0.776	5%	10	0.0001284	M	1.6%	7.22
			Heat Recovery Improvements	3%	70%	3.104	5%	10	0.0001284	M	1.6%	1.02
			Heat Transfer Improvements	1%	70%	0.776	5%	10	0.0001284	M	1.6%	1.02
			Improved Sensors And Process Controls	3%	70%	3.104	8%	10	0.0001284	M	1.6%	1.02
			Load Management (Process Changes)	3%	25%	3.104	2%	10	0.0001284	M	1.6%	3.44
			Timers (Process Heating)	3%	70%	3.104	3%	10	0.0001284	M	1.6%	6.40
			Water Heater Cycling	0%	50%	0.194	2%	10	0.0001284	M	1.6%	6.31
	ROB	Air Compression	Variable Displacement Compressor	0%	30%	0.042	10%	15	0.0001284	L	0.5%	0.57
		HVAC	Destratification Fans	1%	20%	0.103	20%	10	0.0001284	M	5.0%	0.62
			HE Heat Pumps, Including Geothermal	1%	33%	0.118	8%	15	0.0001284	L	0.5%	0.49
			HE HVAC System Design	6%	10%	0.591	8%	15	0.0001284	L	0.5%	0.77
			Industrial Air Curtains	1%	80%	0.304	2%	5	0.0001284	M	5.0%	0.43
		HVAC - Cooling	HE Chillers, Air And Water Cooled	2%	10%	0.185	12%	15	0.0001284	L	0.5%	3.01
			HE Packaged AC	0%	20%	0.064	25%	10	0.0001284	M	5.0%	3.29
			HE Rooftop Ac Systems	0%	10%	0.064	25%	10	0.0001284	M	5.0%	3.29
			Heat Reclaim Absorption Chillers	0%	1%	0.012	90%	15	0.0001284	L	0.5%	5.16
		Motors	Motor - Nema Premium Efficiency	14%	50%	0.994	2%	25	0.0001284	O	1.0%	1.42
				25%	50%	1.813	2%	25	0.0001284	O	1.0%	1.42
				42%	50%	3.042	2%	25	0.0001284	O	1.0%	1.42
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	8%	10%	8.525	67%	15	0.0001284	L	0.5%	0.55
		Other	Motor - Nema Premium Efficiency	4%	50%	0.261	1%	25	0.0001284	O	1.0%	1.39
			Transformers (Nema Tier Ii)	1%	5%	0.046	2%	30	0.0001284	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	2%	50%	0.220	1%	10	0.0001284	M	5.0%	0.83
			Energy Efficient Equipment	2%	50%	0.127	1%	20	0.0001284	M	5.0%	0.32
			HE Compressors	1%	50%	0.079	8%	15	0.0001284	L	0.5%	1.74
			HE Condensers	1%	50%	0.079	2%	15	0.0001284	L	0.5%	1.74
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.007	2%	15	0.0001284	M	5.0%	0.39
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.012	2%	8	0.0001284	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.068	15%	5	0.0001284	M	5.0%	2.95

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Pulp and Paper Total												
Transport Equipm	NC	HVAC	Air Sealing	16%	5%	0.521	17%	15	0.0001501	L	0.5%	0.10
			Cool Roofs And Exterior Walls	20%	2%	0.652	12%	15	0.0001501	L	0.5%	0.06
			HE (ES) Building Design	20%	2%	0.652	30%	15	0.0001501	L	0.5%	0.72
			HE (ES) Windows And Skylights	10%	5%	0.326	19%	15	0.0001501	L	0.5%	0.16
			HVAC System Commissioning	20%	0%	0.652	10%	5	0.0001501	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8%	10%	0.276	12%	15	0.0001501	M	5.0%	3.07
		Lighting	Efficient Lighting Design/Layout	13%	40%	0.430	37%	11	0.0001501	H	12.5%	1.26
			Exterior Light Timers	3%	85%	0.101	30%	15	0.0001501	M	5.0%	6.21
			Interior Lighting Timers/Elapsed Time Switching	11%	33%	0.354	40%	25	0.0001501	H	12.5%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.010	43%	15	0.0001501	L	0.5%	1.72
			Replace Exterior HID with LED Lighting	0%	2%	0.010	60%	15	0.0001501	O	1.8%	1.82
			Replace High Bay HID with PSMH (30% conv)	2%	50%	0.173	10%	15	0.0001501	M	5.0%	1.96
			Replace High Bay HID with T8 (70% conv)	4%	20%	0.173	22%	15	0.0001501	H	12.5%	7.41
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.010	22%	15	0.0001501	H	12.5%	7.41
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.010	10%	15	0.0001501	M	5.0%	1.96
			Replace T12 with HP T8/T5	8%	25%	0.277	49%	15	0.0001501	M	5.0%	5.50
	Retrofit	Air Compression	Advanced Air Compression Controls	3%	30%	5.298	4%	15	0.0001501	O	3.5%	0.90
			Advanced Lubricants	1%	5%	1.097	3%	1	0.0001501	L	0.5%	3.54
			Air Compressor System Management	3%	25%	6.233	20%	2	0.0001501	O	3.0%	0.31
			Blower Purge Dryer	1%	20%	0.954	50%	15	0.0001501	L	0.5%	6.78
			Compressed Air Storage Tank	3%	50%	6.233	2%	15	0.0001501	L	0.5%	8.14
			Compressed Air System Design/Control	3%	80%	6.233	20%	15	0.0001501	L	0.5%	2.26
			Compressed Air System Isolation	3%	20%	6.233	2%	15	0.0001501	O	6.0%	0.90
			Compressed Air System Leak Repair	3%	50%	6.233	10%	2	0.0001501	O	2.0%	3.04
			Cooler Ambient Temperature (-11 Of)	3%	5%	6.233	1%	20	0.0001501	L	0.5%	7.33
			Cycling Air Dryer	1%	25%	1.590	50%	10	0.0001501	L	0.5%	2.39
			Duct In Outside Air To Compressor	3%	10%	4.770	2%	20	0.0001501	L	0.5%	7.33
			Electric Supply System Improvements	3%	10%	6.233	3%	5	0.0001501	M	1.6%	3.92
			Eliminating Wasteful Uses	3%	50%	6.233	1%	5	0.0001501	O	3.0%	2.83
			High Efficiency Air Compress (Upgrade)	3%	60%	4.770	10%	15	0.0001501	O	2.0%	0.22
			Night Shut Off For Compressor	3%	50%	4.986	10%	10	0.0001501	M	1.6%	11.35
			Oil Temperature Control	1%	33%	2.385	2%	10	0.0001501	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	3%	70%	6.233	50%	10	0.0001501	L	0.5%	9.08
			Reduce Operating Pressure Of Compressed Air System	3%	50%	6.233	3%	20	0.0001501	O	2.0%	9.16
			Regular Maintenance	3%	50%	6.233	5%	1	0.0001501	O	2.0%	0.38
			Regulated Compressed Air Nozzles	3%	50%	5.298	2%	15	0.0001501	L	0.5%	8.14
			Vacuum Leak Repair	0%	5%	0.025	2%	2	0.0001501	O	2.0%	3.04
			Vacuum System Isolation	0%	5%	0.025	2%	5	0.0001501	O	3.0%	2.83
			VSD For Air Compressor Motors	1%	30%	4.770	10%	15	0.0001501	O	3.0%	2.39

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Transport Equipm	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	20%	50%	35.615	15%	2	0.0001501	M	1.6%	4.34
			Controls Of Paint Or Spray Booth Exhaust/Supply System	3%	50%	5.698	20%	10	0.0001501	M	1.6%	2.04
			Cool Roofs And Exterior Walls	20%	2%	35.615	12%	15	0.0001501	L	0.5%	0.06
			Energy Management System	20%	10%	35.615	10%	5	0.0001501	M	1.6%	0.83
			HE (ES) Windows And Skylights	10%	5%	17.807	19%	15	0.0001501	L	0.5%	0.16
			HVAC System By-Pass Timer	20%	50%	35.615	5%	5	0.0001501	L	0.5%	2.77
			HVAC System Retrocommissioning*	20%	0%	35.615	10%	5	0.0001501	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	20%	20%	35.615	10%	5	0.0001501	L	0.5%	0.08
			Improve Duct Sealing	20%	15%	35.615	7%	10	0.0001501	M	1.6%	4.26
			Insulate Pipes/Lines	20%	80%	35.615	3%	5	0.0001501	M	1.6%	4.78
			Programmable Thermostat	20%	50%	35.615	4%	5	0.0001501	L	0.5%	7.01
			Thermostat Calibration	20%	10%	35.615	5%	5	0.0001501	L	0.5%	7.01
			Time Clock	20%	10%	35.615	4%	5	0.0001501	L	0.5%	7.01
			Ventilation Controls Installed	16%	5%	28.492	15%	5	0.0001501	L	0.5%	10.73
			VSD On THE Pump Or Fan Motor Of A HVAC System	2%	40%	3.561	30%	10	0.0001501	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	3%	50%	5.660	30%	15	0.0001501	M	1.6%	5.43
			Chilled Water Reset, Optimizer For Chiller(S)	8%	25%	15.093	5%	15	0.0001501	M	1.6%	0.22
			Chiller Optimization Controls	8%	25%	15.093	5%	15	0.0001501	M	1.6%	1.27
			Chiller, Early Retirement	8%	5%	15.093	5%	15	0.0001501	L	0.5%	0.23
			Cooling Tower Optimization	1%	25%	1.887	5%	5	0.0001501	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	2%	2%	3.773	20%	10	0.0001501	M	1.6%	2.16
			Electric Supply System Improvements	8%	10%	15.093	3%	5	0.0001501	L	0.5%	4.04
			Motor System Optimization (Incl. Resizing and Asd)	8%	5%	14.150	6%	10	0.0001501	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	2%	25%	3.773	4%	2	0.0001501	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	13%	40%	23.477	37%	11	0.0001501	M	1.6%	1.26
			Exterior Light Timers	3%	85%	5.524	30%	15	0.0001501	M	1.6%	6.21
			Interior Lighting Timers/Elapsed Time Switching	11%	33%	19.334	40%	25	0.0001501	M	1.6%	1.85
			Replace Exterior HID with Induction Lighting	0%	2%	0.525	43%	15	0.0001501	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.525	60%	15	0.0001501	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	2%	50%	9.446	10%	15	0.0001501	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	4%	20%	9.446	22%	15	0.0001501	O	6.0%	3.43
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.525	10%	15	0.0001501	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.525	22%	15	0.0001501	O	6.0%	3.43
			Replace T12 with HP T8/T5	8%	25%	15.163	49%	15	0.0001501	O	4.0%	1.74
		Motors	Advanced Lubricants and Drivetrain Maintenance	10%	5%	18.472	3%	1	0.0001501	M	1.6%	9.45
			Fan System Efficiency Improvements	8%	10%	14.457	6%	10	0.0001501	M	1.6%	3.49
			Improved Process Scheduling and Deenergizing Idle Machi	44%	25%	80.315	3%	5	0.0001501	L	0.5%	7.27
			Improved Sensors And Process Controls	13%	40%	24.095	3%	10	0.0001501	M	1.6%	1.06
			Low-Load and Soft Start Technologies (Nola Controllers)	4%	25%	80.315	2%	10	0.0001501	O	1.3%	2.84
			Motor Early Retirement	9%	60%	16.063	5%	10	0.0001501	M	1.6%	3.49
			Motor Optimization / Variable Speed Drives (Process Fans,	13%	60%	23.291	30%	15	0.0001501	O	3.0%	2.91
			Process Rework and Scrap Reduction	44%	25%	80.315	3%	5	0.0001501	L	0.5%	7.27
			Pump System Efficiency Improvements	14%	10%	25.701	16%	10	0.0001501	M	1.6%	3.49
			Trim Existing Pump Impeller To More Closely Match Syster	7%	25%	12.850	2%	5	0.0001501	O	1.5%	0.83
			Use of Energy Efficient Belts and Other Improved Mechanis	11%	40%	80.315	3%	2	0.0001501	O	1.3%	2.94
		Other	Advanced Lubricants	1%	5%	1.296	2%	1	0.0001501	M	1.6%	3.45
			Electric Supply System Improvements	3%	10%	5.633	3%	5	0.0001501	M	1.6%	3.82

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Transport Equipm	Retrofit	Process Cooling	Advanced Lubricants	1%	5%	0.961	3%	1	0.0001501	H	3.8%	3.54
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001501	M	1.6%	2.04
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	1%	50%	2.508	5%	10	0.0001501	M	1.6%	0.41
			Chiller Temperature Reset	5%	50%	8.359	1%	1	0.0001501	M	1.6%	1.04
			Condensate Evaporator	2%	10%	3.134	5%	10	0.0001501	M	1.6%	1.26
			Defrost Control System	2%	25%	4.179	3%	10	0.0001501	M	1.6%	2.84
			Desuperheaters	1%	10%	2.090	5%	10	0.0001501	M	1.6%	4.54
			Economizer For Walk-In Coolers	0%	10%	0.418	10%	10	0.0001501	M	1.6%	0.99
			Electric Supply System Improvements	5%	10%	8.359	3%	5	0.0001501	M	1.6%	3.92
			Evaporate Pre-Cooler	1%	10%	2.090	5%	10	0.0001501	M	1.6%	0.20
			Evaporator Fan Controller	1%	10%	2.090	1%	10	0.0001501	M	1.6%	2.84
			Floating Head Pressure Control	2%	50%	4.179	5%	10	0.0001501	M	1.6%	1.97
			Improved Sensors And Process Controls	1%	40%	2.508	3%	10	0.0001501	M	1.6%	1.51
			Insulated Suction Lines	2%	50%	4.179	1%	5	0.0001501	H	3.8%	0.83
			Liquid Pressure Amplifiers	2%	10%	4.179	5%	5	0.0001501	M	1.6%	1.54
			Refrigeration System Maintenance	5%	25%	8.359	5%	3	0.0001501	M	1.6%	4.72
			Repair Refrigerator/Freezer Leaks	5%	50%	8.359	10%	3	0.0001501	M	1.6%	4.72
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.836	7%	15	0.0001501	M	1.6%	3.13
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.836	4%	15	0.0001501	M	1.6%	2.03
			VSD On Refrigeration Circulating Pump	2%	30%	4.179	30%	15	0.0001501	O	3.0%	2.39
			VSD On Refrigeration Fan	2%	30%	4.179	30%	15	0.0001501	O	3.0%	2.39
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.356	2%	15	0.0001501	O	3.0%	0.58
			Heat Containment Improvements	2%	70%	4.452	5%	10	0.0001501	M	1.6%	7.32
			Heat Recovery Improvements	10%	70%	17.807	5%	10	0.0001501	M	1.6%	1.03
			Heat Transfer Improvements	2%	70%	4.452	5%	10	0.0001501	M	1.6%	1.03
			Improved Sensors And Process Controls	10%	70%	17.807	8%	10	0.0001501	M	1.6%	1.03
			Load Management (Process Changes)	10%	25%	17.807	2%	10	0.0001501	M	1.6%	3.49
			Timers (Process Heating)	10%	70%	17.807	3%	10	0.0001501	M	1.6%	6.49
			Water Heater Cycling	0%	50%	0.223	2%	10	0.0001501	M	1.6%	6.39
	ROB	Air Compression	Variable Displacement Compressor	2%	30%	0.304	10%	15	0.0001501	L	0.5%	0.58
		HVAC	Destratification Fans	2%	20%	0.421	20%	10	0.0001501	M	5.0%	0.63
			HE Heat Pumps, Including Geothermal	3%	33%	0.484	8%	15	0.0001501	L	0.5%	0.50
			HE HVAC System Design	16%	10%	2.421	8%	15	0.0001501	L	0.5%	0.79
			Industrial Air Curtains	3%	80%	1.244	2%	5	0.0001501	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	8%	10%	1.282	12%	15	0.0001501	L	0.5%	3.07
			HE Packaged AC	2%	20%	0.446	25%	10	0.0001501	M	5.0%	3.35
			HE Rooftop Ac Systems	2%	10%	0.446	25%	10	0.0001501	M	5.0%	3.35
			Heat Reclaim Absorption Chillers	1%	1%	0.080	90%	15	0.0001501	L	0.5%	5.25
		Motors	Motor - Nema Premium Efficiency	9%	50%	0.936	2%	25	0.0001501	O	1.0%	1.44
				13%	50%	1.405	2%	25	0.0001501	O	1.0%	1.44
				22%	50%	2.341	2%	25	0.0001501	O	1.0%	1.44
			Replace Hydraulic or Inefficient Machine with Efficient, Eeld	4%	10%	6.824	67%	15	0.0001501	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	3%	50%	0.328	1%	25	0.0001501	O	1.0%	1.41
			Transformers (Nema Tier Ii)	1%	5%	0.058	2%	30	0.0001501	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	5%	50%	0.989	1%	10	0.0001501	M	5.0%	0.84
			Energy Efficient Equipment	5%	50%	0.571	1%	20	0.0001501	M	5.0%	0.33
			HE Compressors	2%	50%	0.355	8%	15	0.0001501	L	0.5%	1.77
			HE Condensers	2%	50%	0.355	2%	15	0.0001501	L	0.5%	1.77
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.026	2%	15	0.0001501	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.045	2%	8	0.0001501	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.194	15%	5	0.0001501	M	5.0%	2.99

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Transport Equipment Total												
Wood Products	NC	HVAC	Air Sealing	6%	5%	0.145	17%	15	0.0001542	L	0.5%	0.33
			Cool Roofs And Exterior Walls	7%	2%	0.181	12%	15	0.0001542	L	0.5%	0.06
			HE (ES) Building Design	7%	2%	0.181	30%	15	0.0001542	L	0.5%	0.72
			HE (ES) Windows And Skylights	4%	5%	0.091	19%	15	0.0001542	L	0.5%	0.16
			HVAC System Commissioning	7%	0%	0.181	10%	5	0.0001542	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.072	12%	15	0.0001542	M	5.0%	3.08
		Lighting	Efficient Lighting Design/Layout	6%	40%	0.152	37%	11	0.0001542	H	12.5%	1.27
			Exterior Light Timers	1%	85%	0.036	30%	15	0.0001542	M	5.0%	6.22
			Interior Lighting Timers/Elapsed Time Switching	5%	33%	0.125	40%	25	0.0001542	H	12.5%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.003	43%	15	0.0001542	L	0.5%	1.73
			Replace Exterior HID with LED Lighting	0%	2%	0.003	60%	15	0.0001542	O	1.8%	1.83
			Replace High Bay HID with PSMH (30% conv)	1%	50%	0.053	10%	15	0.0001542	M	5.0%	1.98
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.053	22%	15	0.0001542	H	12.5%	7.48
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.003	22%	15	0.0001542	H	12.5%	7.48
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.003	10%	15	0.0001542	M	5.0%	1.98
			Replace T12 with HP T8/T5	4%	25%	0.105	49%	15	0.0001542	M	5.0%	5.55
	Retrofit	Air Compression	Advanced Air Compression Controls	0%	30%	0.000	4%	15	0.0001542	O	3.5%	0.91
			Advanced Lubricants	0%	5%	0.000	3%	1	0.0001542	L	0.5%	3.55
			Air Compressor System Management	0%	25%	0.000	20%	2	0.0001542	O	3.0%	0.31
			Blower Purge Dryer	0%	20%	0.000	50%	15	0.0001542	L	0.5%	6.80
			Compressed Air Storage Tank	0%	50%	0.000	2%	15	0.0001542	L	0.5%	8.16
			Compressed Air System Design/Control	0%	80%	0.000	20%	15	0.0001542	L	0.5%	2.27
			Compressed Air System Isolation	0%	20%	0.000	2%	15	0.0001542	O	6.0%	0.91
			Compressed Air System Leak Repair	0%	50%	0.000	10%	2	0.0001542	O	2.0%	3.05
			Cooler Ambient Temperature (-11 Of)	0%	5%	0.000	1%	20	0.0001542	L	0.5%	7.35
			Cycling Air Dryer	0%	25%	0.000	50%	10	0.0001542	L	0.5%	2.40
			Duct In Outside Air To Compressor	0%	10%	0.000	2%	20	0.0001542	L	0.5%	7.35
			Electric Supply System Improvements	0%	10%	0.000	3%	5	0.0001542	M	1.6%	3.93
			Eliminating Wasteful Uses	0%	50%	0.000	1%	5	0.0001542	O	3.0%	2.84
			High Efficiency Air Compress (Upgrade)	0%	60%	0.000	10%	15	0.0001542	O	2.0%	0.22
			Night Shut Off For Compressor	0%	50%	0.000	10%	10	0.0001542	M	1.6%	11.38
			Oil Temperature Control	0%	33%	0.000	2%	10	0.0001542	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	0%	70%	0.000	50%	10	0.0001542	L	0.5%	9.10
			Reduce Operating Pressure Of Compressed Air System	0%	50%	0.000	3%	20	0.0001542	O	2.0%	9.18
			Regular Maintenance	0%	50%	0.000	5%	1	0.0001542	O	2.0%	0.38
			Regulated Compressed Air Nozzles	0%	50%	0.000	2%	15	0.0001542	L	0.5%	8.16
			Vacuum Leak Repair	0%	5%	0.000	2%	2	0.0001542	O	2.0%	3.05
			Vacuum System Isolation	0%	5%	0.000	2%	5	0.0001542	O	3.0%	2.84
			VSD For Air Compressor Motors	0%	30%	0.000	10%	15	0.0001542	O	3.0%	2.40

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Wood Products	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	7%	50%	9.912	15%	2	0.0001542	M	1.6%	4.35
			Controls Of Paint Or Spray Booth Exhaust/Supply System	1%	50%	1.586	20%	10	0.0001542	M	1.6%	2.04
			Cool Roofs And Exterior Walls	7%	2%	9.912	12%	15	0.0001542	L	0.5%	0.06
			Energy Management System	7%	10%	9.912	10%	5	0.0001542	M	1.6%	0.84
			HE (ES) Windows And Skylights	4%	5%	4.956	19%	15	0.0001542	L	0.5%	0.16
			HVAC System By-Pass Timer	7%	50%	9.912	5%	5	0.0001542	L	0.5%	2.78
			HVAC System Retrocommissioning*	7%	0%	9.912	10%	5	0.0001542	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	7%	20%	9.912	10%	5	0.0001542	L	0.5%	0.08
			Improve Duct Sealing	7%	15%	9.912	7%	10	0.0001542	M	1.6%	4.27
			Insulate Pipes/Lines	7%	80%	9.912	3%	5	0.0001542	M	1.6%	4.79
			Programmable Thermostat	7%	50%	9.912	4%	5	0.0001542	L	0.5%	7.03
			Thermostat Calibration	7%	10%	9.912	5%	5	0.0001542	L	0.5%	7.03
			Time Clock	7%	10%	9.912	4%	5	0.0001542	L	0.5%	7.03
			Ventilation Controls Installed	6%	5%	7.930	15%	5	0.0001542	L	0.5%	10.76
			VSD On THE Pump Or Fan Motor Of A HVAC System	1%	40%	0.991	30%	10	0.0001542	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	1%	50%	1.479	30%	15	0.0001542	M	1.6%	5.45
			Chilled Water Reset, Optimizer For Chiller(S)	3%	25%	3.945	5%	15	0.0001542	M	1.6%	0.22
			Chiller Optimization Controls	3%	25%	3.945	5%	15	0.0001542	M	1.6%	1.28
			Chiller, Early Retirement	3%	5%	3.945	5%	15	0.0001542	L	0.5%	0.24
			Cooling Tower Optimization	0%	25%	0.493	5%	5	0.0001542	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	1%	2%	0.986	20%	10	0.0001542	M	1.6%	2.17
			Electric Supply System Improvements	3%	10%	3.945	3%	5	0.0001542	L	0.5%	4.06
			Motor System Optimization (Incl. Resizing and Asd)	3%	5%	3.699	6%	10	0.0001542	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	1%	25%	0.986	4%	2	0.0001542	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	6%	40%	8.307	37%	11	0.0001542	M	1.6%	1.27
			Exterior Light Timers	1%	85%	1.955	30%	15	0.0001542	M	1.6%	6.22
			Interior Lighting Timers/Elapsed Time Switching	5%	33%	6.841	40%	25	0.0001542	M	1.6%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.161	43%	15	0.0001542	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.161	60%	15	0.0001542	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	1%	50%	2.903	10%	15	0.0001542	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	1%	20%	2.903	22%	15	0.0001542	O	6.0%	3.46
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.161	10%	15	0.0001542	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.161	22%	15	0.0001542	O	6.0%	3.46
			Replace T12 with HP T8/T5	4%	25%	5.717	49%	15	0.0001542	O	4.0%	1.76
		Motors	Advanced Lubricants and Drivetrain Maintenance	17%	5%	22.670	3%	1	0.0001542	M	1.6%	9.47
			Fan System Efficiency Improvements	9%	10%	11.729	6%	10	0.0001542	M	1.6%	3.50
			Improved Process Scheduling and Deenergizing Idle Machi	72%	25%	98.566	3%	5	0.0001542	L	0.5%	7.29
			Improved Sensors And Process Controls	22%	40%	29.570	3%	10	0.0001542	M	1.6%	1.06
			Low-Load and Soft Start Technologies (Nola Controllers)	7%	25%	98.566	2%	10	0.0001542	O	1.3%	2.85
			Motor Early Retirement	15%	60%	20.699	5%	10	0.0001542	M	1.6%	3.50
			Motor Optimization / Variable Speed Drives (Process Fans,	21%	60%	28.584	30%	15	0.0001542	O	3.0%	2.91
			Process Rework and Scrap Reduction	72%	25%	98.566	3%	5	0.0001542	L	0.5%	7.29
			Pump System Efficiency Improvements	12%	10%	16.165	16%	10	0.0001542	M	1.6%	3.50
			Trim Existing Pump Impeller To More Closely Match Syster	6%	25%	8.082	2%	5	0.0001542	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	18%	40%	98.566	3%	2	0.0001542	O	1.3%	2.95
		Other	Advanced Lubricants	2%	5%	2.505	2%	1	0.0001542	M	1.6%	3.46
			Electric Supply System Improvements	8%	10%	10.890	3%	5	0.0001542	M	1.6%	3.83

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Wood Products	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.096	3%	1	0.0001542	H	3.8%	3.55
			Air Curtain Technologies	0%	50%	0.251	30%	20	0.0001542	M	1.6%	2.04
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0%	50%	0.251	5%	10	0.0001542	M	1.6%	0.41
			Chiller Temperature Reset	1%	50%	0.838	1%	1	0.0001542	M	1.6%	1.04
			Condensate Evaporator	0%	10%	0.314	5%	10	0.0001542	M	1.6%	1.26
			Defrost Control System	0%	25%	0.419	3%	10	0.0001542	M	1.6%	2.85
			Desuperheaters	0%	10%	0.209	5%	10	0.0001542	M	1.6%	4.55
			Economizer For Walk-In Coolers	0%	10%	0.042	10%	10	0.0001542	M	1.6%	0.99
			Electric Supply System Improvements	1%	10%	0.838	3%	5	0.0001542	M	1.6%	3.93
			Evaporate Pre-Cooler	0%	10%	0.209	5%	10	0.0001542	M	1.6%	0.20
			Evaporator Fan Controller	0%	10%	0.209	1%	10	0.0001542	M	1.6%	2.85
			Floating Head Pressure Control	0%	50%	0.419	5%	10	0.0001542	M	1.6%	1.98
			Improved Sensors And Process Controls	0%	40%	0.251	3%	10	0.0001542	M	1.6%	1.52
			Insulated Suction Lines	0%	50%	0.419	1%	5	0.0001542	H	3.8%	0.84
			Liquid Pressure Amplifiers	0%	10%	0.419	5%	5	0.0001542	M	1.6%	1.55
			Refrigeration System Maintenance	1%	25%	0.838	5%	3	0.0001542	M	1.6%	4.74
			Repair Refrigerator/Freezer Leaks	1%	50%	0.838	10%	3	0.0001542	M	1.6%	4.74
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.084	7%	15	0.0001542	M	1.6%	3.14
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.084	4%	15	0.0001542	M	1.6%	2.04
			VSD On Refrigeration Circulating Pump	0%	30%	0.419	30%	15	0.0001542	O	3.0%	2.40
			VSD On Refrigeration Fan	0%	30%	0.419	30%	15	0.0001542	O	3.0%	2.40
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	2%	35%	2.563	2%	15	0.0001542	O	3.0%	0.59
			Heat Containment Improvements	1%	70%	1.780	5%	10	0.0001542	M	1.6%	7.34
			Heat Recovery Improvements	5%	70%	7.120	5%	10	0.0001542	M	1.6%	1.03
			Heat Transfer Improvements	1%	70%	1.780	5%	10	0.0001542	M	1.6%	1.03
			Improved Sensors And Process Controls	5%	70%	7.120	8%	10	0.0001542	M	1.6%	1.03
			Load Management (Process Changes)	5%	25%	7.120	2%	10	0.0001542	M	1.6%	3.50
			Timers (Process Heating)	5%	70%	7.120	3%	10	0.0001542	M	1.6%	6.50
			Water Heater Cycling	1%	50%	1.602	2%	10	0.0001542	M	1.6%	6.41
	ROB	Air Compression	Variable Displacement Compressor	0%	30%	0.000	10%	15	0.0001542	L	0.5%	0.58
		HVAC	Destratification Fans	1%	20%	0.117	20%	10	0.0001542	M	5.0%	0.64
			HE Heat Pumps, Including Geothermal	1%	33%	0.135	8%	15	0.0001542	L	0.5%	0.50
			HE HVAC System Design	6%	10%	0.674	8%	15	0.0001542	L	0.5%	0.79
			Industrial Air Curtains	1%	80%	0.346	2%	5	0.0001542	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	3%	10%	0.335	12%	15	0.0001542	L	0.5%	3.08
			HE Packaged AC	1%	20%	0.117	25%	10	0.0001542	M	5.0%	3.36
			HE Rooftop Ac Systems	1%	10%	0.117	25%	10	0.0001542	M	5.0%	3.36
			Heat Reclaim Absorption Chillers	0%	1%	0.021	90%	15	0.0001542	L	0.5%	5.27
		Motors	Motor - Nema Premium Efficiency	15%	50%	1.207	2%	25	0.0001542	O	1.0%	1.45
				18%	50%	1.437	2%	25	0.0001542	O	1.0%	1.45
				39%	50%	3.103	2%	25	0.0001542	O	1.0%	1.45
			Replace Hydraulic or Inefficient Machine with Efficient, Eel	7%	10%	8.375	67%	15	0.0001542	L	0.5%	0.56
		Other	Motor - Nema Premium Efficiency	8%	50%	0.635	1%	25	0.0001542	O	1.0%	1.41
			Transformers (Nema Tier Ii)	2%	5%	0.112	2%	30	0.0001542	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	1%	50%	0.099	1%	10	0.0001542	M	5.0%	0.84
			Energy Efficient Equipment	1%	50%	0.057	1%	20	0.0001542	M	5.0%	0.33
			HE Compressors	0%	50%	0.036	8%	15	0.0001542	L	0.5%	1.77
			HE Condensers	0%	50%	0.036	2%	15	0.0001542	L	0.5%	1.77
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.003	2%	15	0.0001542	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.005	2%	8	0.0001542	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.008	15%	5	0.0001542	M	5.0%	3.00

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
Wood Products Total												
WWTF	NC	HVAC	Air Sealing	0%	5%	0.000	17%	15	0.0001569	L	0.5%	0.52
			Cool Roofs And Exterior Walls	0%	2%	0.000	12%	15	0.0001569	L	0.5%	0.06
			HE (ES) Building Design	0%	2%	0.000	30%	15	0.0001569	L	0.5%	0.72
			HE (ES) Windows And Skylights	0%	5%	0.000	19%	15	0.0001569	L	0.5%	0.16
			HVAC System Commissioning	0%	0%	0.000	10%	5	0.0001569	L	0.5%	0.08
		HVAC - Cooling	HE Chillers, Air And Water Cooled	0%	10%	0.000	12%	15	0.0001569	M	5.0%	3.08
		Lighting	Efficient Lighting Design/Layout	3%	40%	0.026	37%	11	0.0001569	H	12.5%	1.27
			Exterior Light Timers	1%	85%	0.006	30%	15	0.0001569	M	5.0%	6.24
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	0.021	40%	25	0.0001569	H	12.5%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.000	43%	15	0.0001569	L	0.5%	1.73
			Replace Exterior HID with LED Lighting	0%	2%	0.000	60%	15	0.0001569	O	1.8%	1.83
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.009	10%	15	0.0001569	M	5.0%	1.98
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.009	22%	15	0.0001569	H	12.5%	7.47
			Replace Inefficient Non High Bay HID with T8 (70% conv)	0%	33%	0.000	22%	15	0.0001569	H	12.5%	7.47
			Replace Inefficient Non High Bay HID with PSMH	0%	50%	0.000	10%	15	0.0001569	M	5.0%	1.98
			Replace T12 with HP T8/T5	2%	25%	0.017	49%	15	0.0001569	M	5.0%	5.54
	Retrofit	Air Compression	Advanced Air Compression Controls	42%	30%	17.175	4%	15	0.0001569	O	3.5%	0.91
			Advanced Lubricants	9%	5%	3.557	3%	1	0.0001569	L	0.5%	3.56
			Air Compressor System Management	49%	25%	20.206	20%	2	0.0001569	O	3.0%	0.31
			Blower Purge Dryer	8%	20%	3.093	50%	15	0.0001569	L	0.5%	6.81
			Compressed Air Storage Tank	49%	50%	20.206	2%	15	0.0001569	L	0.5%	8.17
			Compressed Air System Design/Control	49%	80%	20.206	20%	15	0.0001569	L	0.5%	2.27
			Compressed Air System Isolation	49%	20%	20.206	2%	15	0.0001569	O	6.0%	0.91
			Compressed Air System Leak Repair	49%	50%	20.206	10%	2	0.0001569	O	2.0%	3.05
			Cooler Ambient Temperature (-11 Of)	49%	5%	20.206	1%	20	0.0001569	L	0.5%	7.36
			Cycling Air Dryer	13%	25%	5.155	50%	10	0.0001569	L	0.5%	2.40
			Duct In Outside Air To Compressor	38%	10%	15.464	2%	20	0.0001569	L	0.5%	7.36
			Electric Supply System Improvements	49%	10%	20.206	3%	5	0.0001569	M	1.6%	3.93
			Eliminating Wasteful Uses	49%	50%	20.206	1%	5	0.0001569	O	3.0%	2.84
			High Efficiency Air Compress (Upgrade)	38%	60%	15.464	10%	15	0.0001569	O	2.0%	0.22
			Night Shut Off For Compressor	39%	50%	16.165	10%	10	0.0001569	M	1.6%	11.40
			Oil Temperature Control	19%	33%	7.732	2%	10	0.0001569	M	1.6%	1.01
			Process - Swap CA Tools For Electric Ones	49%	70%	20.206	50%	10	0.0001569	L	0.5%	9.12
			Reduce Operating Pressure Of Compressed Air System	49%	50%	20.206	3%	20	0.0001569	O	2.0%	9.20
			Regular Maintenance	49%	50%	20.206	5%	1	0.0001569	O	2.0%	0.38
			Regulated Compressed Air Nozzles	42%	50%	17.175	2%	15	0.0001569	L	0.5%	8.17
			Vacuum Leak Repair	0%	5%	0.082	2%	2	0.0001569	O	2.0%	3.05
			Vacuum System Isolation	0%	5%	0.082	2%	5	0.0001569	O	3.0%	2.84
			VSD For Air Compressor Motors	19%	30%	15.464	10%	15	0.0001569	O	3.0%	2.40

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
WWTF	Retrofit	HVAC	Building Scheduling - Adjust Occupied/Unoccupied Schedu	0%	50%	0.000	15%	2	0.0001569	M	1.6%	4.36
			Controls Of Paint Or Spray Booth Exhaust/Supply System	0%	50%	0.000	20%	10	0.0001569	M	1.6%	2.05
			Cool Roofs And Exterior Walls	0%	2%	0.000	12%	15	0.0001569	L	0.5%	0.06
			Energy Management System	0%	10%	0.000	10%	5	0.0001569	M	1.6%	0.84
			HE (ES) Windows And Skylights	0%	5%	0.000	19%	15	0.0001569	L	0.5%	0.16
			HVAC System By-Pass Timer	0%	50%	0.000	5%	5	0.0001569	L	0.5%	2.78
			HVAC System Retrocommissioning*	0%	0%	0.000	10%	5	0.0001569	L	0.5%	0.08
			HVAC System Tune-Up/Maintenance	0%	20%	0.000	10%	5	0.0001569	L	0.5%	0.08
			Improve Duct Sealing	0%	15%	0.000	7%	10	0.0001569	M	1.6%	4.28
			Insulate Pipes/Lines	0%	80%	0.000	3%	5	0.0001569	M	1.6%	4.80
			Programmable Thermostat	0%	50%	0.000	4%	5	0.0001569	L	0.5%	7.05
			Thermostat Calibration	0%	10%	0.000	5%	5	0.0001569	L	0.5%	7.05
			Time Clock	0%	10%	0.000	4%	5	0.0001569	L	0.5%	7.05
			Ventilation Controls Installed	0%	5%	0.000	15%	5	0.0001569	L	0.5%	10.78
			VSD On THE Pump Or Fan Motor Of A HVAC System	0%	40%	0.000	30%	10	0.0001569	O	3.0%	0.67
		HVAC - Cooling	Chilled Water Free Cooling Controls And Equipments	0%	50%	0.000	30%	15	0.0001569	M	1.6%	5.46
			Chilled Water Reset, Optimizer For Chiller(S)	0%	25%	0.000	5%	15	0.0001569	M	1.6%	0.22
			Chiller Optimization Controls	0%	25%	0.000	5%	15	0.0001569	M	1.6%	1.28
			Chiller, Early Retirement	0%	5%	0.000	5%	15	0.0001569	L	0.5%	0.24
			Cooling Tower Optimization	0%	25%	0.000	5%	5	0.0001569	M	1.6%	0.28
			Economizer (Hydronic Or Outside Air)	0%	2%	0.000	20%	10	0.0001569	M	1.6%	2.17
			Electric Supply System Improvements	0%	10%	0.000	3%	5	0.0001569	L	0.5%	4.06
			Motor System Optimization (Incl. Resizing and Asd)	0%	5%	0.000	6%	10	0.0001569	O	3.0%	0.67
			Ultraviolet A/C Coil Cleaning System	0%	25%	0.000	4%	2	0.0001569	L	0.5%	0.22
		Lighting	Efficient Lighting Design/Layout	3%	40%	1.402	37%	11	0.0001569	M	1.6%	1.27
			Exterior Light Timers	1%	85%	0.330	30%	15	0.0001569	M	1.6%	6.24
			Interior Lighting Timers/Elapsed Time Switching	3%	33%	1.155	40%	25	0.0001569	M	1.6%	1.86
			Replace Exterior HID with Induction Lighting	0%	2%	0.027	43%	15	0.0001569	L	0.5%	0.86
			Replace Exterior HID with LED Lighting	0%	2%	0.027	60%	15	0.0001569	O	1.8%	0.44
			Replace High Bay HID with PSMH (30% conv)	0%	50%	0.490	10%	15	0.0001569	O	1.3%	0.56
			Replace High Bay HID with T8 (70% conv)	1%	20%	0.490	22%	15	0.0001569	O	6.0%	3.46
			Replace Inefficient Non-High Bay HID with PSMH	0%	50%	0.027	10%	15	0.0001569	O	1.3%	0.56
			Replace Inefficient Non-High Bay HID with T8 (70% conv)	0%	33%	0.027	22%	15	0.0001569	O	6.0%	3.46
			Replace T12 with HP T8/T5	2%	25%	0.950	49%	15	0.0001569	O	4.0%	1.75
		Motors	Advanced Lubricants and Drivetrain Maintenance	9%	5%	3.794	3%	1	0.0001569	M	1.6%	9.49
			Fan System Efficiency Improvements	7%	10%	2.969	6%	10	0.0001569	M	1.6%	3.51
			Improved Process Scheduling and Deenergizing Idle Machi	40%	25%	16.495	3%	5	0.0001569	L	0.5%	7.31
			Improved Sensors And Process Controls	12%	40%	4.948	3%	10	0.0001569	M	1.6%	1.06
			Low-Load and Soft Start Technologies (Nola Controllers)	4%	25%	16.495	2%	10	0.0001569	O	1.3%	2.85
			Motor Early Retirement	8%	60%	3.299	5%	10	0.0001569	M	1.6%	3.51
			Motor Optimization / Variable Speed Drives (Process Fans,	12%	60%	4.783	30%	15	0.0001569	O	3.0%	2.92
			Process Rework and Scrap Reduction	40%	25%	16.495	3%	5	0.0001569	L	0.5%	7.31
			Pump System Efficiency Improvements	12%	10%	4.948	16%	10	0.0001569	M	1.6%	3.51
			Trim Existing Pump Impeller To More Closely Match Syster	6%	25%	2.474	2%	5	0.0001569	O	1.5%	0.84
			Use of Energy Efficient Belts and Other Improved Mechanis	10%	40%	16.495	3%	2	0.0001569	O	1.3%	2.95
		Other	Advanced Lubricants	1%	5%	0.569	2%	1	0.0001569	M	1.6%	3.47
			Electric Supply System Improvements	6%	10%	2.474	3%	5	0.0001569	M	1.6%	3.84

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (GWh)	Technical Savngs Rate (%)	Measure Useful Life (yrs)	Load Reduction Factor (kW/kWh)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (%)	TRC Ratio
WWTF	Retrofit	Process Cooling	Advanced Lubricants	0%	5%	0.000	3%	1	0.0001569	H	3.8%	3.56
			Air Curtain Technologies	0%	50%	0.000	30%	20	0.0001569	M	1.6%	2.04
			Ambient Sub-Cooling - Install Oversized Condenser Or Lar	0%	50%	0.000	5%	10	0.0001569	M	1.6%	0.41
			Chiller Temperature Reset	0%	50%	0.000	1%	1	0.0001569	M	1.6%	1.04
			Condensate Evaporator	0%	10%	0.000	5%	10	0.0001569	M	1.6%	1.27
			Defrost Control System	0%	25%	0.000	3%	10	0.0001569	M	1.6%	2.85
			Desuperheaters	0%	10%	0.000	5%	10	0.0001569	M	1.6%	4.56
			Economizer For Walk-In Coolers	0%	10%	0.000	10%	10	0.0001569	M	1.6%	0.99
			Electric Supply System Improvements	0%	10%	0.000	3%	5	0.0001569	M	1.6%	3.93
			Evaporate Pre-Cooler	0%	10%	0.000	5%	10	0.0001569	M	1.6%	0.21
			Evaporator Fan Controller	0%	10%	0.000	1%	10	0.0001569	M	1.6%	2.85
			Floating Head Pressure Control	0%	50%	0.000	5%	10	0.0001569	M	1.6%	1.98
			Improved Sensors And Process Controls	0%	40%	0.000	3%	10	0.0001569	M	1.6%	1.52
			Insulated Suction Lines	0%	50%	0.000	1%	5	0.0001569	H	3.8%	0.84
			Liquid Pressure Amplifiers	0%	10%	0.000	5%	5	0.0001569	M	1.6%	1.55
			Refrigeration System Maintenance	0%	25%	0.000	5%	3	0.0001569	M	1.6%	4.74
			Repair Refrigerator/Freezer Leaks	0%	50%	0.000	10%	3	0.0001569	M	1.6%	4.74
			Replace Shaded-Pole Motor With Ecm (Electrically Commu	0%	0%	0.000	7%	15	0.0001569	M	1.6%	3.14
			Replace Shaded-Pole Motor With Psc (Permanent Split Ca	0%	0%	0.000	4%	15	0.0001569	M	1.6%	2.04
			VSD On Refrigeration Circulating Pump	0%	30%	0.000	30%	15	0.0001569	O	3.0%	2.40
			VSD On Refrigeration Fan	0%	30%	0.000	30%	15	0.0001569	O	3.0%	2.40
		Process Heating (E)	Boiler - VSD For Process/HVAC Boiler Distribution Pumps	0%	35%	0.000	2%	15	0.0001569	O	3.0%	0.59
			Heat Containment Improvements	0%	70%	0.000	5%	10	0.0001569	M	1.6%	7.36
			Heat Recovery Improvements	0%	70%	0.000	5%	10	0.0001569	M	1.6%	1.04
			Heat Transfer Improvements	0%	70%	0.000	5%	10	0.0001569	M	1.6%	1.04
			Improved Sensors And Process Controls	0%	70%	0.000	8%	10	0.0001569	M	1.6%	1.04
			Load Management (Process Changes)	0%	25%	0.000	2%	10	0.0001569	M	1.6%	3.51
			Timers (Process Heating)	0%	70%	0.000	3%	10	0.0001569	M	1.6%	6.51
			Water Heater Cycling	0%	50%	0.000	2%	10	0.0001569	M	1.6%	6.42
	ROB	Air Compression	Variable Displacement Compressor	28%	30%	0.985	10%	15	0.0001569	L	0.5%	0.58
		HVAC	Destratification Fans	0%	20%	0.000	20%	10	0.0001569	M	5.0%	0.64
			HE Heat Pumps, Including Geothermal	0%	33%	0.000	8%	15	0.0001569	L	0.5%	0.50
			HE HVAC System Design	0%	10%	0.000	8%	15	0.0001569	L	0.5%	0.79
			Industrial Air Curtains	0%	80%	0.000	2%	5	0.0001569	M	5.0%	0.44
		HVAC - Cooling	HE Chillers, Air And Water Cooled	0%	10%	0.000	12%	15	0.0001569	L	0.5%	3.08
			HE Packaged AC	0%	20%	0.000	25%	10	0.0001569	M	5.0%	3.37
			HE Rooftop Ac Systems	0%	10%	0.000	25%	10	0.0001569	M	5.0%	3.37
			Heat Reclaim Absorption Chillers	0%	1%	0.000	90%	15	0.0001569	L	0.5%	5.28
		Motors	Motor - Nema Premium Efficiency	8%	50%	0.192	2%	25	0.0001569	O	1.0%	1.45
				12%	50%	0.288	2%	25	0.0001569	O	1.0%	1.45
				20%	50%	0.481	2%	25	0.0001569	O	1.0%	1.45
		Other	Motor - Nema Premium Efficiency	6%	50%	0.144	1%	25	0.0001569	O	1.0%	1.41
			Transformers (Nema Tier Ii)	1%	5%	0.026	2%	30	0.0001569	M	5.0%	0.17
		Process Cooling	Cooling Tower Free Cooling	0%	50%	0.000	1%	10	0.0001569	M	5.0%	0.84
			Energy Efficient Equipment	0%	50%	0.000	1%	20	0.0001569	M	5.0%	0.33
			HE Compressors	0%	50%	0.000	8%	15	0.0001569	L	0.5%	1.78
			HE Condensers	0%	50%	0.000	2%	15	0.0001569	L	0.5%	1.78
		Process Heating (E)	Electric Curing - Replacement with more Efficient Technolo	0%	5%	0.000	2%	15	0.0001569	M	5.0%	0.40
			Electric Drying - Replacement with more Efficient Technolo	0%	5%	0.000	2%	8	0.0001569	M	5.0%	0.37
			Emmissions RTO - Reduce Head Loss Through Media	0%	50%	0.000	15%	5	0.0001569	M	5.0%	3.01

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Chemicals	NC	HVAC - Heating	HE (ES) Building Design	2%	2%	9	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	1%	5%	9	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	1%	5%	9	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	1%	5%	9	1%	15	L	0.5%	0.34
			Improved Wall Insulation	1%	1%	9	1%	15	L	0.5%	0.17
			HE HVAC System Design	2%	10%	9	30%	15	M	1.6%	1.86
			Radiant floor heating	0%	50%	9	12%	30	M	1.6%	9.31
			HVAC System Commissioning	0%	0%	9	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	1%	5%	476	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	1%	5%	476	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	1%	5%	476	1%	15	L	0.5%	0.34
			Improved Wall Insulation	1%	1%	476	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	0%	70%	476	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	0%	70%	476	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	0%	70%	476	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate T	0%	65%	476	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	0%	20%	476	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	0%	40%	476	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	0%	30%	476	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	476	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	0%	10%	476	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	1%	5%	476	5%	15	M	1.6%	4.00
			Destratification Fans	0%	10%	476	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	1%	15%	476	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	476	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	1%	5%	476	15%	15	M	1.6%	1.33
			Improve Duct Sealing	2%	15%	476	7%	10	M	1.6%	5.09
			Increase Use of Zoning	2%	20%	476	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	2%	80%	476	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	0%	20%	476	15%	15	M	1.6%	13.78
			Boiler Tune-Up	0%	25%	476	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	0%	50%	476	1%	5	M	1.6%	23.27
			Energy Management System	0%	10%	476	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	0%	10%	476	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	0%	0%	476	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	0%	20%	476	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	0%	50%	476	4%	10	M	1.6%	19.21
			Thermostat Calibration	0%	10%	476	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Chemicals	Retrofit	Steam Production	Boiler - Automatic Chemical feed	44%	70%	13,359	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	44%	20%	13,359	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	4%	20%	13,359	1%	15	M	1.6%	2.56
			Boiler Tune-Up	55%	25%	13,359	6%	2	M	1.6%	10.91
			Heat Trap	11%	80%	13,359	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	22%	37%	13,359	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	13%	50%	13,359	2%	10	H	3.8%	3.24
			Steam leak repair	9%	50%	13,359	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	55%	35%	13,359	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	7%	70%	13,359	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	2%	70%	13,359	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	17%	30%	13,359	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	6%	5%	13,359	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	17%	50%	13,359	30%	15	L	0.5%	8.75
			Solar Water Heater	1%	5%	13,359	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	7%	5%	13,359	2%	15	M	1.6%	5.10
			Improve Water Treatment	42%	5%	13,359	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	4%	5%	13,359	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	8%	5%	13,359	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	2%	5%	13,359	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	5%	5%	13,359	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	5%	5%	13,359	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	8%	5%	13,359	3%	15	M	1.6%	7.59
			Industry Specific Steam System Optimization Mea	8%	5%	13,359	4%	15	M	1.6%	5.12
		Process Heating (G	Condensing Heat Exchanger	5%	5%	8,473	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	27%	10%	8,473	13%	15	L	0.5%	2.46
			Burner Upgrades	27%	5%	8,473	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	8%	70%	8,473	50%	15	L	0.5%	3.50
			Insulating Blankets	8%	80%	8,473	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	6%	20%	8,473	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	8,473	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	8,473	30%	10	M	1.6%	0.06
			Install Stack Melting Furnace	0%	0%	8,473	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	8,473	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	8,473	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	8,473	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	8,473	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	8,473	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	8,473	5%	10	L	0.5%	4.00
			Load Management	35%	25%	8,473	4%	10	M	1.6%	11.27
			Water Heater Cycling	18%	50%	8,473	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	35%	70%	8,473	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	35%	70%	8,473	19%	1	L	0.5%	14.10
			Timers	35%	70%	8,473	1%	10	M	1.6%	11.43
			Waste Heat Recovery	18%	80%	8,473	26%	15	L	0.5%	1.70
			Process Heat Recovery	18%	80%	8,473	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	13%	50%	8,473	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	8,473	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Chemicals	ROB	HVAC - Heating	HE Boilers (>300kBTU)	0%	49%	32	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	0%	20%	32	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	0%	33%	40	8%	15	L	0.5%	0.49
			HE Unit Heaters	0%	10%	40	34%	15	M	5.0%	8.62
			Infrared Heater	0%	5%	40	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	44%	49%	912	19%	20	O	15.0%	3.21
Fabricated M	NC	HVAC - Heating	HE (ES) Building Design	21%	2%	7	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	10%	5%	7	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	10%	5%	7	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	10%	5%	7	1%	15	L	0.5%	0.34
			Improved Wall Insulation	10%	1%	7	1%	15	L	0.5%	0.17
			HE HVAC System Design	21%	10%	7	30%	15	M	1.6%	1.86
			Radiant floor heating	2%	50%	7	12%	30	M	1.6%	9.31
			HVAC System Commissioning	2%	0%	7	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	10%	5%	370	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	10%	5%	370	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	10%	5%	370	1%	15	L	0.5%	0.34
			Improved Wall Insulation	10%	1%	370	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	2%	70%	370	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	2%	70%	370	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	2%	70%	370	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	2%	65%	370	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	2%	20%	370	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	2%	40%	370	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	2%	30%	370	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	1%	0%	370	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	3%	10%	370	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	7%	5%	370	5%	15	M	1.6%	4.00
			Destratification Fans	2%	10%	370	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	8%	15%	370	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	1%	50%	370	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	7%	5%	370	15%	15	M	1.6%	1.33
			Improve Duct Sealing	21%	15%	370	7%	10	M	1.6%	5.09
			Increase Use of Zoning	21%	20%	370	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	21%	80%	370	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	2%	20%	370	15%	15	M	1.6%	13.78
			Boiler Tune-Up	2%	25%	370	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	2%	50%	370	1%	5	M	1.6%	23.27
			Energy Management System	2%	10%	370	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	2%	10%	370	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	2%	0%	370	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	2%	20%	370	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	2%	50%	370	4%	10	M	1.6%	19.21
			Thermostat Calibration	2%	10%	370	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Fabricated M	Retrofit	Steam Production	Boiler - Automatic Chemical feed	0%	70%	-	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	0%	20%	-	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	0%	20%	-	1%	15	M	1.6%	2.56
			Boiler Tune-Up	0%	25%	-	6%	2	M	1.6%	10.91
			Heat Trap	0%	80%	-	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	0%	37%	-	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	0%	50%	-	2%	10	H	3.8%	3.24
			Steam leak repair	0%	50%	-	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	0%	35%	-	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	0%	70%	-	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	0%	70%	-	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	0%	30%	-	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	0%	5%	-	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	0%	50%	-	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	-	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	0%	5%	-	2%	15	M	1.6%	5.10
			Improve Water Treatment	0%	5%	-	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	0%	5%	-	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	0%	5%	-	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	0%	5%	-	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	0%	5%	-	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	0%	5%	-	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	0%	5%	-	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	1%	5%	1,118	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	6%	10%	1,118	13%	15	L	0.5%	2.46
			Burner Upgrades	6%	5%	1,118	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	6%	70%	1,118	50%	15	L	0.5%	3.50
			Insulating Blankets	6%	80%	1,118	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	5%	20%	1,118	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	1,118	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	1,118	30%	10	M	1.6%	0.05
			Install Stack Melting Furnace	0%	0%	1,118	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	1,118	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	1,118	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	1,118	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	1,118	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	1,118	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	1,118	5%	10	L	0.5%	4.00
			Load Management	62%	25%	1,118	4%	10	M	1.6%	11.27
			Water Heater Cycling	31%	50%	1,118	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	62%	70%	1,118	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	62%	70%	1,118	19%	1	L	0.5%	14.10
			Timers	62%	70%	1,118	1%	10	M	1.6%	11.43
			Waste Heat Recovery	31%	80%	1,118	26%	15	L	0.5%	1.70
			Process Heat Recovery	31%	80%	1,118	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	3%	50%	1,118	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	1,118	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Fabricated M	ROB	HVAC - Heating	HE Boilers (>300kBTU)	2%	49%	25	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	2%	20%	25	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	2%	33%	31	8%	15	L	0.5%	0.49
			HE Unit Heaters	3%	10%	31	34%	15	M	5.0%	8.62
			Infrared Heater	3%	5%	31	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	0%	49%	-	19%	20	O	15.0%	3.21
Food	NC	HVAC - Heating	HE (ES) Building Design	6%	2%	10	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	3%	5%	10	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	3%	5%	10	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	3%	5%	10	1%	15	L	0.5%	0.34
			Improved Wall Insulation	3%	1%	10	1%	15	L	0.5%	0.17
			HE HVAC System Design	6%	10%	10	30%	15	M	1.6%	1.86
			Radiant floor heating	1%	50%	10	12%	30	M	1.6%	9.31
			HVAC System Commissioning	1%	0%	10	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	3%	5%	551	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	3%	5%	551	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	3%	5%	551	1%	15	L	0.5%	0.34
			Improved Wall Insulation	3%	1%	551	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	1%	70%	551	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	1%	70%	551	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	1%	70%	551	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	1%	65%	551	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	1%	20%	551	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	1%	40%	551	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	1%	30%	551	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	551	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	1%	10%	551	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	2%	5%	551	5%	15	M	1.6%	4.00
			Destratification Fans	1%	10%	551	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	2%	15%	551	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	551	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	2%	5%	551	15%	15	M	1.6%	1.33
			Improve Duct Sealing	6%	15%	551	7%	10	M	1.6%	5.09
			Increase Use of Zoning	6%	20%	551	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	6%	80%	551	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	1%	20%	551	15%	15	M	1.6%	13.78
			Boiler Tune-Up	1%	25%	551	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	1%	50%	551	1%	5	M	1.6%	23.27
			Energy Management System	1%	10%	551	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	1%	10%	551	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	1%	0%	551	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	1%	20%	551	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	1%	50%	551	4%	10	M	1.6%	19.21
			Thermostat Calibration	1%	10%	551	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Food	Retrofit	Steam Production	Boiler - Automatic Chemical feed	38%	70%	4,094	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	38%	20%	4,094	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	4%	20%	4,094	1%	15	M	1.6%	2.56
			Boiler Tune-Up	48%	25%	4,094	6%	2	M	1.6%	10.91
			Heat Trap	10%	80%	4,094	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	19%	37%	4,094	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	12%	50%	4,094	2%	10	H	3.8%	3.24
			Steam leak repair	8%	50%	4,094	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	48%	35%	4,094	3%	2	O	2.5%	13.20
			Blowdown Heat Recovery	6%	70%	4,094	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	2%	70%	4,094	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	14%	30%	4,094	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	5%	5%	4,094	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	14%	50%	4,094	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	4,094	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	6%	5%	4,094	2%	15	M	1.6%	5.10
			Improve Water Treatment	36%	5%	4,094	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	3%	5%	4,094	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	7%	5%	4,094	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	2%	5%	4,094	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	4%	5%	4,094	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	4%	5%	4,094	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	7%	5%	4,094	3%	15	M	1.6%	6.96
		Process Heating (G	Condensing Heat Exchanger	6%	5%	3,052	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	32%	10%	3,052	13%	15	L	0.5%	2.46
			Burner Upgrades	32%	5%	3,052	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	4%	70%	3,052	50%	15	L	0.5%	3.50
			Insulating Blankets	4%	80%	3,052	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	3%	20%	3,052	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	3,052	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	3,052	30%	10	M	1.6%	0.08
			Install Stack Melting Furnace	0%	0%	3,052	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	3,052	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	3,052	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	3,052	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	3,052	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	3,052	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	3,052	5%	10	L	0.5%	4.00
			Load Management	36%	25%	3,052	4%	10	M	1.6%	11.27
			Water Heater Cycling	18%	50%	3,052	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	36%	70%	3,052	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	36%	70%	3,052	19%	1	L	0.5%	14.10
			Timers	36%	70%	3,052	1%	10	M	1.6%	11.43
			Waste Heat Recovery	18%	80%	3,052	26%	15	L	0.5%	1.70
			Process Heat Recovery	18%	80%	3,052	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	16%	50%	3,052	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	3,052	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Food	ROB	HVAC - Heating	HE Boilers (>300kBTU)	1%	49%	38	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	1%	20%	38	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	1%	33%	47	8%	15	L	0.5%	0.49
			HE Unit Heaters	1%	10%	47	34%	15	M	5.0%	8.62
			Infrared Heater	1%	5%	47	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	38%	49%	280	19%	20	O	15.0%	3.21
Machinery	NC	HVAC - Heating	HE (ES) Building Design	37%	2%	17	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	18%	5%	17	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	18%	5%	17	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	18%	5%	17	1%	15	L	0.5%	0.34
			Improved Wall Insulation	18%	1%	17	1%	15	L	0.5%	0.17
			HE HVAC System Design	37%	10%	17	30%	15	M	1.6%	1.86
			Radiant floor heating	4%	50%	17	12%	30	M	1.6%	9.31
			HVAC System Commissioning	4%	0%	17	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	18%	5%	926	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	18%	5%	926	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	18%	5%	926	1%	15	L	0.5%	0.34
			Improved Wall Insulation	18%	1%	926	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	3%	70%	926	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	4%	70%	926	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	3%	70%	926	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	3%	65%	926	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	3%	20%	926	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	3%	40%	926	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	3%	30%	926	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	2%	0%	926	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	5%	10%	926	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	12%	5%	926	5%	15	M	1.6%	4.00
			Destratification Fans	4%	10%	926	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	14%	15%	926	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	1%	50%	926	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	12%	5%	926	15%	15	M	1.6%	1.33
			Improve Duct Sealing	37%	15%	926	7%	10	M	1.6%	5.09
			Increase Use of Zoning	37%	20%	926	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	37%	80%	926	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	4%	20%	926	15%	15	M	1.6%	13.78
			Boiler Tune-Up	4%	25%	926	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	4%	50%	926	1%	5	M	1.6%	23.27
			Energy Management System	4%	10%	926	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	4%	10%	926	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	4%	0%	926	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	4%	20%	926	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	4%	50%	926	4%	10	M	1.6%	19.21
			Thermostat Calibration	4%	10%	926	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Machinery	Retrofit	Steam Production	Boiler - Automatic Chemical feed	14%	70%	432	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	14%	20%	432	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	1%	20%	432	1%	15	M	1.6%	2.56
			Boiler Tune-Up	17%	25%	432	6%	2	M	1.6%	10.91
			Heat Trap	3%	80%	432	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	7%	37%	432	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	4%	50%	432	2%	10	H	3.8%	3.24
			Steam leak repair	3%	50%	432	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	17%	35%	432	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	2%	70%	432	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	1%	70%	432	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	5%	30%	432	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	2%	5%	432	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	5%	50%	432	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	432	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	2%	5%	432	2%	15	M	1.6%	5.10
			Improve Water Treatment	13%	5%	432	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	1%	5%	432	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	2%	5%	432	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	1%	5%	432	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	1%	5%	432	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	2%	5%	432	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	3%	5%	432	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	1%	5%	926	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	4%	10%	926	13%	15	L	0.5%	2.46
			Burner Upgrades	4%	5%	926	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	4%	70%	926	50%	15	L	0.5%	3.50
			Insulating Blankets	4%	80%	926	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	3%	20%	926	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	926	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	926	30%	10	M	1.6%	0.04
			Install Stack Melting Furnace	0%	0%	926	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	926	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	926	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	926	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	926	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	926	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	926	5%	10	L	0.5%	4.00
			Load Management	37%	25%	926	4%	10	M	1.6%	11.27
			Water Heater Cycling	18%	50%	926	5%	10	M	1.6%	11.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Machinery	Retrofit	Process Heating (C	Improved Sensors and Process Controls	37%	70%	926	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	37%	70%	926	19%	1	L	0.5%	14.10
			Timers	37%	70%	926	1%	10	M	1.6%	11.43
			Waste Heat Recovery	18%	80%	926	26%	15	L	0.5%	1.70
			Process Heat Recovery	18%	80%	926	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and Cu	2%	50%	926	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	926	30%	10	M	1.6%	11.12
	ROB	HVAC - Heating	HE Boilers (>300kBTU)	3%	49%	63	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	3%	20%	63	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	4%	33%	79	8%	15	L	0.5%	0.49
			HE Unit Heaters	5%	10%	79	34%	15	M	5.0%	8.62
			Infrared Heater	5%	5%	79	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	14%	49%	30	19%	20	O	15.0%	3.21
Metals Prima	NC	HVAC - Heating	HE (ES) Building Design	7%	2%	38	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	3%	5%	38	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	3%	5%	38	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	3%	5%	38	1%	15	L	0.5%	0.34
			Improved Wall Insulation	3%	1%	38	1%	15	L	0.5%	0.17
			HE HVAC System Design	7%	10%	38	30%	15	M	1.6%	1.86
			Radiant floor heating	1%	50%	38	12%	30	M	1.6%	9.31
			HVAC System Commissioning	1%	0%	38	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	3%	5%	2,099	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	3%	5%	2,099	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	3%	5%	2,099	1%	15	L	0.5%	0.34
			Improved Wall Insulation	3%	1%	2,099	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	1%	70%	2,099	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	1%	70%	2,099	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	1%	70%	2,099	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate T	1%	65%	2,099	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	1%	20%	2,099	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	1%	40%	2,099	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	1%	30%	2,099	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	2,099	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	1%	10%	2,099	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	2%	5%	2,099	5%	15	M	1.6%	4.00
			Destratification Fans	1%	10%	2,099	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	3%	15%	2,099	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	2,099	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	2%	5%	2,099	15%	15	M	1.6%	1.33
			Improve Duct Sealing	7%	15%	2,099	7%	10	M	1.6%	5.09
			Increase Use of Zoning	7%	20%	2,099	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	7%	80%	2,099	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	1%	20%	2,099	15%	15	M	1.6%	13.78
			Boiler Tune-Up	1%	25%	2,099	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	1%	50%	2,099	1%	5	M	1.6%	23.27
			Energy Management System	1%	10%	2,099	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	1%	10%	2,099	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	1%	0%	2,099	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	1%	20%	2,099	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	1%	50%	2,099	4%	10	M	1.6%	19.21
			Thermostat Calibration	1%	10%	2,099	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Metals Prima	Retrofit	Steam Production	Boiler - Automatic Chemical feed	8%	70%	3,311	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	8%	20%	3,311	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	1%	20%	3,311	1%	15	M	1.6%	2.56
			Boiler Tune-Up	11%	25%	3,311	6%	2	M	1.6%	10.91
			Heat Trap	2%	80%	3,311	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	4%	37%	3,311	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	3%	50%	3,311	2%	10	H	3.8%	3.24
			Steam leak repair	2%	50%	3,311	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	11%	35%	3,311	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	1%	70%	3,311	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	0%	70%	3,311	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	3%	30%	3,311	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	1%	5%	3,311	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	3%	50%	3,311	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	3,311	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	1%	5%	3,311	2%	15	M	1.6%	5.10
			Improve Water Treatment	8%	5%	3,311	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	1%	5%	3,311	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	1%	5%	3,311	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	0%	5%	3,311	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	1%	5%	3,311	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	1%	5%	3,311	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	2%	5%	3,311	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	6%	5%	24,718	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	28%	10%	24,718	13%	15	L	0.5%	2.46
			Burner Upgrades	28%	5%	24,718	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	8%	70%	24,718	50%	15	L	0.5%	3.50
			Insulating Blankets	8%	80%	24,718	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	6%	20%	24,718	5%	15	M	1.6%	11.95
			Metal Casting -Burner Upgrades	40%	5%	24,718	2%	10	M	1.6%	8.99
			Electric Preheat	40%	10%	24,718	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	40%	0%	24,718	30%	10	M	1.6%	0.05
			Install Stack Melting Furnace	2%	0%	24,718	50%	20	M	1.6%	7.97
			Metal Casting - Insulating Blankets	40%	80%	24,718	1%	10	M	1.6%	11.12
			Insulation - Refractory Fibers	40%	30%	24,718	5%	15	M	1.6%	4.43
			Preheat combustion air	40%	50%	24,718	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	20%	10%	24,718	11%	5	L	0.5%	5.22
			Recuperator	20%	50%	24,718	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	20%	50%	24,718	5%	10	L	0.5%	1.51
			Regenerator	8%	30%	24,718	5%	10	L	0.5%	4.00
			Load Management	79%	25%	24,718	4%	10	M	1.6%	11.27
			Water Heater Cycling	40%	50%	24,718	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	79%	70%	24,718	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	79%	70%	24,718	19%	1	L	0.5%	14.10
			Timers	79%	70%	24,718	1%	10	M	1.6%	11.43
			Waste Heat Recovery	40%	80%	24,718	26%	15	L	0.5%	1.70
			Process Heat Recovery	40%	80%	24,718	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	14%	50%	24,718	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	20%	50%	24,718	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Metals Prima	ROB	HVAC - Heating	HE Boilers (>300kBTU)	1%	49%	143	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	1%	20%	143	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	1%	33%	178	8%	15	L	0.5%	0.49
			HE Unit Heaters	1%	10%	178	34%	15	M	5.0%	8.62
			Infrared Heater	1%	5%	178	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	8%	49%	226	19%	20	O	15.0%	3.21
Other	NC	HVAC - Heating	HE (ES) Building Design	7%	2%	2	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	4%	5%	2	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	4%	5%	2	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	4%	5%	2	1%	15	L	0.5%	0.34
			Improved Wall Insulation	4%	1%	2	1%	15	L	0.5%	0.17
			HE HVAC System Design	7%	10%	2	30%	15	M	1.6%	1.86
			Radiant floor heating	1%	50%	2	12%	30	M	1.6%	9.31
			HVAC System Commissioning	1%	0%	2	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	4%	5%	110	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	4%	5%	110	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	4%	5%	110	1%	15	L	0.5%	0.34
			Improved Wall Insulation	4%	1%	110	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	1%	70%	110	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	1%	70%	110	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	1%	70%	110	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	1%	65%	110	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	1%	20%	110	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	1%	40%	110	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	1%	30%	110	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	110	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	1%	10%	110	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	2%	5%	110	5%	15	M	1.6%	4.00
			Destratification Fans	1%	10%	110	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	3%	15%	110	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	110	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	2%	5%	110	15%	15	M	1.6%	1.33
			Improve Duct Sealing	7%	15%	110	7%	10	M	1.6%	5.09
			Increase Use of Zoning	7%	20%	110	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	7%	80%	110	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	1%	20%	110	15%	15	M	1.6%	13.78
			Boiler Tune-Up	1%	25%	110	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	1%	50%	110	1%	5	M	1.6%	23.27
			Energy Management System	1%	10%	110	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	1%	10%	110	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	1%	0%	110	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	1%	20%	110	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	1%	50%	110	4%	10	M	1.6%	19.21
			Thermostat Calibration	1%	10%	110	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Other	Retrofit	Steam Production	Boiler - Automatic Chemical feed	30%	70%	572	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	30%	20%	572	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	3%	20%	572	1%	15	M	1.6%	2.56
			Boiler Tune-Up	37%	25%	572	6%	2	M	1.6%	10.91
			Heat Trap	7%	80%	572	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	15%	37%	572	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	9%	50%	572	2%	10	H	3.8%	3.24
			Steam leak repair	6%	50%	572	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	37%	35%	572	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	4%	70%	572	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	1%	70%	572	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	11%	30%	572	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	4%	5%	572	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	11%	50%	572	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	572	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	5%	5%	572	2%	15	M	1.6%	5.10
			Improve Water Treatment	28%	5%	572	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	2%	5%	572	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	5%	5%	572	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	1%	5%	572	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	3%	5%	572	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	3%	5%	572	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	6%	5%	572	3%	15	M	1.6%	7.59
			Industry Specific Steam System Optimization Mea	6%	5%	572	4%	15	L	0.5%	5.12
		Process Heating (G	Condensing Heat Exchanger	1%	5%	725	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	5%	10%	725	13%	15	L	0.5%	2.46
			Burner Upgrades	5%	5%	725	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	5%	70%	725	50%	15	L	0.5%	3.50
			Insulating Blankets	5%	80%	725	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	4%	20%	725	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	725	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	725	30%	10	M	1.6%	0.04
			Install Stack Melting Furnace	0%	0%	725	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	725	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	725	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	725	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	725	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	725	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	725	5%	10	L	0.5%	4.00
			Load Management	47%	25%	725	4%	10	M	1.6%	11.27
			Water Heater Cycling	24%	50%	725	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	47%	70%	725	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	47%	70%	725	19%	1	L	0.5%	14.10
			Timers	47%	70%	725	1%	10	M	1.6%	11.43
			Waste Heat Recovery	24%	80%	725	26%	15	L	0.5%	1.70
			Process Heat Recovery	24%	80%	725	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	2%	50%	725	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	725	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Other	ROB	HVAC - Heating	HE Boilers (>300kBTU)	1%	49%	8	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	1%	20%	8	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	1%	33%	9	8%	15	L	0.5%	0.49
			HE Unit Heaters	1%	10%	9	34%	15	M	5.0%	8.62
			Infrared Heater	1%	5%	9	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	30%	49%	39	19%	20	O	15.0%	3.21
Transport Eq	NC	HVAC - Heating	HE (ES) Building Design	31%	2%	16	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	15%	5%	16	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	15%	5%	16	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	15%	5%	16	1%	15	L	0.5%	0.34
			Improved Wall Insulation	15%	1%	16	1%	15	L	0.5%	0.17
			HE HVAC System Design	31%	10%	16	30%	15	M	1.6%	1.86
			Radiant floor heating	3%	50%	16	12%	30	M	1.6%	9.31
			HVAC System Commissioning	3%	0%	16	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	15%	5%	889	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	15%	5%	889	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	15%	5%	889	1%	15	L	0.5%	0.34
			Improved Wall Insulation	15%	1%	889	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	2%	70%	889	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	3%	70%	889	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	2%	70%	889	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	2%	65%	889	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	2%	20%	889	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	2%	40%	889	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	2%	30%	889	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	1%	0%	889	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	5%	10%	889	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	10%	5%	889	5%	15	M	1.6%	4.00
			Destratification Fans	3%	10%	889	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	12%	15%	889	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	1%	50%	889	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	10%	5%	889	15%	15	M	1.6%	1.33
			Improve Duct Sealing	31%	15%	889	7%	10	M	1.6%	5.09
			Increase Use of Zoning	31%	20%	889	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	31%	80%	889	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	3%	20%	889	15%	15	M	1.6%	13.78
			Boiler Tune-Up	3%	25%	889	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	3%	50%	889	1%	5	M	1.6%	23.27
			Energy Management System	3%	10%	889	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	3%	10%	889	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	3%	0%	889	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	3%	20%	889	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	3%	50%	889	4%	10	M	1.6%	19.21
			Thermostat Calibration	3%	10%	889	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Transport Eq	Retrofit	Steam Production	Boiler - Automatic Chemical feed	20%	70%	731	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	20%	20%	731	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	2%	20%	731	1%	15	M	1.6%	2.56
			Boiler Tune-Up	25%	25%	731	6%	2	M	1.6%	10.91
			Heat Trap	5%	80%	731	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	10%	37%	731	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	6%	50%	731	2%	10	H	3.8%	3.24
			Steam leak repair	4%	50%	731	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	25%	35%	731	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	3%	70%	731	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	1%	70%	731	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	8%	30%	731	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	3%	5%	731	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	8%	50%	731	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	731	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	3%	5%	731	2%	15	M	1.6%	5.10
			Improve Water Treatment	19%	5%	731	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	2%	5%	731	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	4%	5%	731	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	1%	5%	731	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	2%	5%	731	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	2%	5%	731	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	4%	5%	731	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	1%	5%	903	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	3%	10%	903	13%	15	L	0.5%	2.46
			Burner Upgrades	3%	5%	903	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	3%	70%	903	50%	15	L	0.5%	3.50
			Insulating Blankets	3%	80%	903	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	2%	20%	903	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	903	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	903	30%	10	M	1.6%	0.04
			Install Stack Melting Furnace	0%	0%	903	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	903	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	903	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	903	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	903	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	903	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	903	5%	10	L	0.5%	4.00
			Load Management	31%	25%	903	4%	10	M	1.6%	11.27
			Water Heater Cycling	16%	50%	903	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	31%	70%	903	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	31%	70%	903	19%	1	L	0.5%	14.10
			Timers	31%	70%	903	1%	10	M	1.6%	11.43
			Waste Heat Recovery	16%	80%	903	26%	15	L	0.5%	1.70
			Process Heat Recovery	16%	80%	903	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	2%	50%	903	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	903	30%	10	M	1.6%	11.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Transport Eq	ROB	HVAC - Heating	HE Boilers (>300kBTU)	2%	49%	61	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	3%	20%	61	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	4%	33%	76	8%	15	L	0.5%	0.49
			HE Unit Heaters	5%	10%	76	34%	15	M	5.0%	8.62
			Infrared Heater	5%	5%	76	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	20%	49%	50	19%	20	O	15.0%	3.21
Wood Produ	NC	HVAC - Heating	HE (ES) Building Design	12%	2%	3	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	6%	5%	3	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	6%	5%	3	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	6%	5%	3	1%	15	L	0.5%	0.34
			Improved Wall Insulation	6%	1%	3	1%	15	L	0.5%	0.17
			HE HVAC System Design	12%	10%	3	30%	15	M	1.6%	1.86
			Radiant floor heating	1%	50%	3	12%	30	M	1.6%	9.31
			HVAC System Commissioning	1%	0%	3	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Air Sealing	6%	5%	164	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	6%	5%	164	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	6%	5%	164	1%	15	L	0.5%	0.34
			Improved Wall Insulation	6%	1%	164	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	1%	70%	164	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	1%	70%	164	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	1%	70%	164	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate	1%	65%	164	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	1%	20%	164	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	1%	40%	164	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	1%	30%	164	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	1%	0%	164	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	2%	10%	164	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	4%	5%	164	5%	15	M	1.6%	4.00
			Destratification Fans	1%	10%	164	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	5%	15%	164	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	164	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	4%	5%	164	15%	15	M	1.6%	1.33
			Improve Duct Sealing	12%	15%	164	7%	10	M	1.6%	5.09
			Increase Use of Zoning	12%	20%	164	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	12%	80%	164	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	1%	20%	164	15%	15	M	1.6%	13.78
			Boiler Tune-Up	1%	25%	164	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	1%	50%	164	1%	5	M	1.6%	23.27
			Energy Management System	1%	10%	164	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	1%	10%	164	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	1%	0%	164	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	1%	20%	164	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	1%	50%	164	4%	10	M	1.6%	19.21
			Thermostat Calibration	1%	10%	164	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Wood Produ	Retrofit	Steam Production	Boiler - Automatic Chemical feed	21%	70%	350	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	21%	20%	350	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	2%	20%	350	1%	15	M	1.6%	2.56
			Boiler Tune-Up	26%	25%	350	6%	2	M	1.6%	10.91
			Heat Trap	5%	80%	350	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	11%	37%	350	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	6%	50%	350	2%	10	H	3.8%	3.24
			Steam leak repair	4%	50%	350	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	26%	35%	350	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	3%	70%	350	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	1%	70%	350	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	8%	30%	350	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	3%	5%	350	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	8%	50%	350	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	350	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	3%	5%	350	2%	15	M	1.6%	5.10
			Improve Water Treatment	20%	5%	350	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	2%	5%	350	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	4%	5%	350	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	1%	5%	350	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	2%	5%	350	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	2%	5%	350	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	4%	5%	350	3%	15	M	1.6%	7.59

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Wood Produ	Retrofit	Process Heating (C	Condensing Heat Exchanger	2%	5%	654	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	12%	10%	654	13%	15	L	0.5%	2.46
			Burner Upgrades	12%	5%	654	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	12%	70%	654	50%	15	L	0.5%	3.50
			Insulating Blankets	12%	80%	654	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	10%	20%	654	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	654	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	654	30%	10	M	1.6%	0.07
			Install Stack Melting Furnace	0%	0%	654	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	654	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	654	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	654	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	654	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	654	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	654	5%	10	L	0.5%	4.00
			Load Management	49%	25%	654	4%	10	M	1.6%	11.27
			Water Heater Cycling	25%	50%	654	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	49%	70%	654	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	49%	70%	654	19%	1	L	0.5%	14.10
			Timers	49%	70%	654	1%	10	M	1.6%	11.43
			Waste Heat Recovery	25%	80%	654	26%	15	L	0.5%	1.70
			Process Heat Recovery	25%	80%	654	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	6%	50%	654	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	654	30%	10	M	1.6%	11.12
	ROB	HVAC - Heating	HE Boilers (>300kBTU)	1%	49%	11	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	1%	20%	11	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	1%	33%	14	8%	15	L	0.5%	0.49
			HE Unit Heaters	2%	10%	14	34%	15	M	5.0%	8.62
			Infrared Heater	2%	5%	14	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	21%	49%	24	19%	20	O	15.0%	3.21
WWTF	NC	HVAC - Heating	HE (ES) Building Design	7%	2%	2	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	4%	5%	2	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	4%	5%	2	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	4%	5%	2	1%	15	L	0.5%	0.34
			Improved Wall Insulation	4%	1%	2	1%	15	L	0.5%	0.17
			HE HVAC System Design	7%	10%	2	30%	15	M	1.6%	1.86
			Radiant floor heating	1%	50%	2	12%	30	M	1.6%	9.31
			HVAC System Commissioning	1%	0%	2	10%	5	L	0.5%	1.34

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
WWTF	Retrofit	HVAC - Heating	Air Sealing	4%	5%	110	2%	15	L	0.5%	1.27
			Improved Below-Grade Insulation	4%	5%	110	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	4%	5%	110	1%	15	L	0.5%	0.34
			Improved Wall Insulation	4%	1%	110	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	1%	70%	110	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	1%	70%	110	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	1%	70%	110	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate T	1%	65%	110	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	1%	20%	110	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	1%	40%	110	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	1%	30%	110	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	110	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	1%	10%	110	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	2%	5%	110	5%	15	M	1.6%	4.00
			Destratification Fans	1%	10%	110	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	3%	15%	110	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	110	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	2%	5%	110	15%	15	M	1.6%	1.33
			Improve Duct Sealing	7%	15%	110	7%	10	M	1.6%	5.09
			Increase Use of Zoning	7%	20%	110	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	7%	80%	110	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	1%	20%	110	15%	15	M	1.6%	13.78
			Boiler Tune-Up	1%	25%	110	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	1%	50%	110	1%	5	M	1.6%	23.27
			Energy Management System	1%	10%	110	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	1%	10%	110	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	1%	0%	110	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	1%	20%	110	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	1%	50%	110	4%	10	M	1.6%	19.21
			Thermostat Calibration	1%	10%	110	2%	5	M	1.6%	25.43

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
WWTF	Retrofit	Steam Production	Boiler - Automatic Chemical feed	30%	70%	572	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	30%	20%	572	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	3%	20%	572	1%	15	M	1.6%	2.56
			Boiler Tune-Up	37%	25%	572	6%	2	M	1.6%	10.91
			Heat Trap	7%	80%	572	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	15%	37%	572	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	9%	50%	572	2%	10	H	3.8%	3.24
			Steam leak repair	6%	50%	572	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	37%	35%	572	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	4%	70%	572	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	1%	70%	572	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	11%	30%	572	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	4%	5%	572	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	11%	50%	572	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	572	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	5%	5%	572	2%	15	M	1.6%	5.10
			Improve Water Treatment	28%	5%	572	1%	15	L	0.5%	3.12
			Clean Boiler Heat Transfer Surfaces	2%	5%	572	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	5%	5%	572	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	1%	5%	572	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	3%	5%	572	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	3%	5%	572	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	6%	5%	572	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	2%	5%	725	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	12%	10%	725	13%	15	L	0.5%	2.46
			Burner Upgrades	12%	5%	725	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	12%	70%	725	50%	15	L	0.5%	3.50
			Insulating Blankets	12%	80%	725	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	9%	20%	725	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	725	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	725	30%	10	M	1.6%	0.04
			Install Stack Melting Furnace	0%	0%	725	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	725	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	725	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	725	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	725	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	725	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	725	5%	10	L	0.5%	4.00
			Load Management	47%	25%	725	4%	10	M	1.6%	11.27
			Water Heater Cycling	24%	50%	725	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	47%	70%	725	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	47%	70%	725	19%	1	L	0.5%	14.10
			Timers	47%	70%	725	1%	10	M	1.6%	11.43
			Waste Heat Recovery	24%	80%	725	26%	15	L	0.5%	1.70
			Process Heat Recovery	24%	80%	725	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	6%	50%	725	30%	10	M	1.6%	11.12
			Repair Leaks, Insulation and Seals (Metal Casting	0%	50%	725	30%	10	M	1.6%	11.12
	ROB	HVAC - Heating	HE Boilers (>300kBTU)	1%	49%	8	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	1%	20%	8	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	1%	33%	9	8%	15	L	0.5%	0.49
			HE Unit Heaters	1%	10%	9	34%	15	M	5.0%	8.62
			Infrared Heater	1%	5%	9	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	30%	49%	39	19%	20	O	15.0%	3.21

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Beverage an	NC	HVAC - Heating	HE (ES) Building Design	0%	2%	-	1%	15	L	0.5%	0.33
			HE (ES) Windows and Skylights	0%	5%	-	1%	15	L	0.5%	0.11
			Improved Below-Grade Insulation	0%	5%	-	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	0%	5%	-	1%	15	L	0.5%	0.34
			Improved Wall Insulation	0%	1%	-	1%	15	L	0.5%	0.17
			HE HVAC System Design	0%	10%	-	30%	15	M	1.6%	1.86
			Radiant floor heating	0%	50%	-	12%	30	M	1.6%	9.31
			HVAC System Commissioning	0%	0%	-	10%	5	L	0.5%	1.34
	Retrofit	HVAC - Heating	Improved Below-Grade Insulation	0%	5%	-	1%	15	L	0.5%	0.33
			Improved Roof/Ceiling Insulation	0%	5%	-	1%	15	L	0.5%	0.34
			Improved Wall Insulation	0%	1%	-	1%	15	L	0.5%	0.17
			Boiler - Automatic Chemical feed	0%	70%	-	1%	15	M	1.6%	20.10
			Boiler - Flue gas heat recovery	0%	70%	-	2%	15	M	1.6%	9.07
			Boiler - Install Damper Controls	0%	70%	-	5%	15	O	6.0%	4.59
			Boiler - Insulate Boiler Expansion or Condensate T	0%	65%	-	8%	15	M	1.6%	5.10
			Boiler - Steam System Isolation (Isolate from area	0%	20%	-	15%	15	M	1.6%	2.66
			Boiler - Steam to Hot Water Conversion	0%	40%	-	25%	15	M	1.6%	5.72
			Boiler O2 Trim Controls	0%	30%	-	2%	10	O	6.0%	7.91
			Heat Recovery for Space Heating	0%	0%	-	1%	20	M	1.6%	7.13
			Gas IR Radiant Heating	0%	10%	-	19%	15	M	1.6%	0.51
			Micro Channel Heat Exchangers	0%	5%	-	5%	15	M	1.6%	4.00
			Destratification Fans	0%	10%	-	10%	15	M	1.6%	14.81
			Exhaust Hood Makeup Air	0%	15%	-	5%	15	M	1.6%	1.33
			Solar ventilation pre-heat	0%	50%	-	15%	15	L	0.5%	3.23
			Ventilation Controls Installed	0%	5%	-	15%	15	M	1.6%	1.33
			Improve Duct Sealing	0%	15%	-	7%	10	M	1.6%	5.09
			Increase Use of Zoning	0%	20%	-	15%	20	M	1.6%	0.30
			Insulate Pipes/Lines	0%	80%	-	1%	10	M	1.6%	5.09
			Boiler Controls / Cx and RCx	0%	20%	-	15%	15	M	1.6%	13.78
			Boiler Tune-Up	0%	25%	-	2%	2	M	1.6%	16.66
			Building Scheduling - Adjust occupied/unoccupied	0%	50%	-	1%	5	M	1.6%	23.27
			Energy Management System	0%	10%	-	10%	10	M	1.6%	1.19
			HVAC System By-pass Timer	0%	10%	-	1%	10	L	0.5%	19.21
			HVAC System Retrocommissioning	0%	0%	-	10%	5	L	0.5%	0.68
			HVAC System Tune-up/Maintenance	0%	20%	-	10%	5	M	1.6%	15.51
			Programmable Thermostat (incl minimum set-poin	0%	50%	-	4%	10	M	1.6%	19.21
			Thermostat Calibration	0%	10%	-	2%	5	M	1.6%	25.43
		Steam Production	Boiler - Automatic Chemical feed	0%	70%	-	1%	10	M	1.6%	21.63
			Boiler - Install Damper Controls	0%	20%	-	5%	15	O	6.0%	4.43
			Boiler - Steam System Isolation (Isolate from area	0%	20%	-	1%	15	M	1.6%	2.56
			Boiler Tune-Up	0%	25%	-	6%	2	M	1.6%	10.91
			Heat Trap	0%	80%	-	5%	5	M	1.6%	21.82
			Insulate piping, valves, fittings, vessels	0%	37%	-	1%	10	M	1.6%	4.91
			Improved Condensate Recovery	0%	50%	-	2%	10	H	3.8%	3.24
			Steam leak repair	0%	50%	-	1%	2	M	1.6%	22.94
			Steam Trap Maintenance	0%	35%	-	3%	2	O	2.5%	12.35
			Blowdown Heat Recovery	0%	70%	-	1%	15	M	1.6%	9.32
			Cumbustion Air Preheater (Flue Recovery)	0%	70%	-	2%	15	M	1.6%	8.75
			Boiler O2 Trim Controls and Optimizing Excess Ai	0%	30%	-	2%	10	O	6.0%	7.62
			Burner Upgrades, Repair and Replacement	0%	5%	-	2%	10	M	1.6%	2.99
			Heat Recovery for Hot Water Use	0%	50%	-	30%	15	L	0.5%	8.75
			Solar Water Heater	0%	5%	-	60%	15	L	0.5%	0.15
			Install Feedwater Economizers	0%	5%	-	2%	15	M	1.6%	5.10
			Improve Water Treatment	0%	5%	-	1%	15	L	0.5%	3.12

Segment	Market	End Use	Measure	Base Saturation (% of Segment Energy Applicable to Measure)	EE Saturation (%)	Base Energy Applicable to Measure (BBTU)	Technical Savngs Rate (%)	Meaure Useful Life (yrs)	Delphi Entry (O, H, M, L)	Annual Impact of Aggressive Programs (2012) (%)	TRC Ratio
Beverage an	Retrofit	Steam Production	Clean Boiler Heat Transfer Surfaces	0%	5%	-	1%	2	M	1.6%	10.32
			Improve Blowdown Practices	0%	5%	-	1%	15	M	1.6%	10.25
			Add/Restore Boiler Refractory	0%	5%	-	1%	15	L	0.5%	7.98
			Establish the Correct Vent Rate for Dearator	0%	5%	-	1%	15	M	1.6%	16.38
			Reduce Steam System Generating Pressure	0%	5%	-	1%	15	M	1.6%	19.44
			Other Steam System Improvements and Controls	0%	5%	-	3%	15	M	1.6%	7.59
		Process Heating (G	Condensing Heat Exchanger	0%	5%	-	8%	10	M	1.6%	5.00
			Improved Gas Drying and Heating Technologies	0%	10%	-	13%	15	L	0.5%	2.46
			Burner Upgrades	0%	5%	-	4%	10	M	1.6%	13.34
			Emissions Control Improvements (RTO, RCO, Re	0%	70%	-	50%	15	L	0.5%	3.50
			Insulating Blankets	0%	80%	-	1%	10	M	1.6%	11.12
			Install Automatic Stack Dampers	0%	20%	-	5%	15	M	1.6%	11.95
			Electric Preheat	0%	10%	-	10%	8	M	1.6%	0.10
			Electric Melting - Fuel Switch	0%	0%	-	30%	10	M	1.6%	0.07
			Install Stack Melting Furnace	0%	0%	-	50%	20	M	1.6%	7.97
			Insulation - Refractory Fibers	0%	30%	-	5%	15	M	1.6%	4.43
			Preheat combustion air	0%	50%	-	12%	15	M	1.6%	8.75
			Radiant tube inserts installed in exhaust of radiant	0%	10%	-	11%	5	L	0.5%	5.22
			Recuperator	0%	50%	-	30%	10	L	0.5%	11.12
			Recuperative Burners Installed	0%	50%	-	5%	10	L	0.5%	1.51
			Regenerator	0%	30%	-	5%	10	L	0.5%	4.00
			Load Management	0%	25%	-	4%	10	M	1.6%	11.27
			Water Heater Cycling	0%	50%	-	5%	10	M	1.6%	11.43
			Improved Sensors and Process Controls	0%	70%	-	8%	8	M	1.6%	8.13
			Reduced Temperature Setpoints	0%	70%	-	19%	1	L	0.5%	14.10
			Timers	0%	70%	-	1%	10	M	1.6%	11.43
			Waste Heat Recovery	0%	80%	-	26%	15	L	0.5%	1.70
			Process Heat Recovery	0%	80%	-	25%	15	M	1.6%	0.36
			Repair Leaks, Insulation and Seals (Drying and C	0%	30%	-	30%	10	M	1.6%	11.43
			Repair Leaks, Insulation and Seals (Metal Casting	0%	30%	-	30%	10	M	1.6%	11.43
	ROB	HVAC - Heating	HE Boilers (>300kBTU)	0%	49%	-	19%	20	O	15.0%	3.33
			HE Furnaces (>300kBTU)	0%	20%	-	10%	20	O	12.0%	2.29
			HE Heat Pumps, including geothermal	0%	33%	-	8%	15	L	0.5%	0.49
			HE Unit Heaters	0%	10%	-	34%	15	M	5.0%	8.62
			Infrared Heater	0%	5%	-	12%	15	M	5.0%	0.51
		Steam Production	HE Boilers (>300kBTU)	0%	49%	-	19%	20	O	15.0%	3.21
Agriculture	Retrofit	Process Heating (G	Grain Drying - Process Improvements	27%	25%	966	20%	15	M	1.6%	1.45
											1.77
					30%	966	20%	15	M	1.6%	3.58
	ROB	Process Heating (G	Grain Drying - More Efficient Dryers	27%	10%	82	20%	15	L	0.5%	2.77
											3.06
											3.30

APPENDIX D : DETAILED RESULTS

In the following tables negative savings values are the result of measure interaction, where an energy efficiency measure associated with primary electricity or natural gas savings produces a corresponding increase in consumption of the other fuel.

Segment	Measure	Electric Economic Potential (GWh)	Electric Achievable Potential 2012 (GWh)	Electric Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Total Cost of Deployed Measures (2012) ($1,000)	Total PV of Deployed Measures (2012) ($1,000)
Single Family	CFL Bulbs, purchased replacement (2012)	60.96	15.24	0.00	(239,811)	(63,135)	0	1.13	0.00	$1,064.82	$2,551.15
	ECM Furnace	3.94	1.04	1.24	0	0	0	0.40	0.48	$225.40	$734.06
	Exterior Lighting Controls	16.21	0.72	1.19	0	0	0	0.00	0.00	$294.02	$298.03
	Heating system fuel switch - Electric to Gas	100.87	0.53	0.87	(84,248)	(3,451)	(5,677)	0.00	0.00	$405.17	$106.20
	2-Stage Central AC	2.51	0.40	0.47	0	0	0	1.34	1.56	$559.23	$823.00
	Radiant Barrier (Ceiling) -- Central AC	18.51	0.31	0.81	0	0	0	1.03	2.70	$216.81	$779.44
	Energy Star Clothes Washer (w/ Elec. WH & Elec. Dryer)	3.21	0.14	0.29	0	0	0	0.03	0.06	$54.89	$82.77
	Direct load control of water heaters	24.16	0.12	0.27	0	0	0	0.02	0.05	$32.95	$64.10
	Heat Pump Water Heater	6.05	0.12	0.36	0	0	0	0.02	0.07	$86.07	$87.23
	Low Flow Showerhead	5.82	0.10	0.27	0	0	0	0.02	0.05	$12.75	$42.23
	Direct load control of air conditioners	14.60	0.08	0.17	0	0	0	0.27	0.57	$69.73	$117.78
	Home Electronics Efficiency Upgrade (Energy Star)	1.31	0.08	0.12	(3,909)	(243)	(378)	0.01	0.02	$6.59	$18.94
	Water Heater Blanket	3.31	0.07	0.18	0	0	0	0.01	0.04	$5.79	$31.08
	Shower Controls (Shower Start Technology)	9.08	0.05	0.14	0	0	0	0.01	0.03	$24.03	$24.41
	Faucet aerator (3 per home)	4.57	0.04	0.12	0	0	0	0.01	0.02	$11.77	$18.25
	Air Source Heat_Pump 18 SEER, 9.0 HSPF	1.86	0.03	0.09	0	0	0	0.11	0.30	$30.57	$63.90
	Efficient Electric Water Heater	0.47	0.03	0.03	0	0	0	0.01	0.01	$34.55	$15.99
	Air Source Heat_Pump 16 SEER, 8.8 HSPF	1.26	0.02	0.06	0	0	0	0.08	0.20	$18.18	$43.39
	New Construction, Improved Plumbing Design	0.00	0.02	0.02	0	0	0	0.00	0.00	$22.46	$21.58
	Desuperheater for central air conditioner (ASHP) system	0.65	0.01	0.03	3,226	57	150	0.04	0.11	$9.81	$17.04
	Water Heater Setback	0.14	0.01	0.02	0	0	0	0.00	0.00	$0.26	$2.58
	Air Source Heat_Pump 14 SEER, 8.5 HSPF	0.48	0.01	0.02	0	0	0	0.03	0.08	$4.85	$15.18
	Radiant Barrier (Ceiling) -- Heat pump	0.48	0.01	0.02	0	0	0	0.03	0.07	$4.56	$20.42
	Radiant Barrier (Ceiling) -- Central Heat	2.67	0.01	0.02	0	0	0	0.00	0.00	$3.57	$4.40
	Programmable Thermostats - gas furnace	0.38	0.00	0.01	1,031,374	22,856	49,290	0.01	0.02	$20.83	$229.59
	Energy Star Clothes Washer (w/ Elec. WH & NG Dryer)	0.02	0.00	0.01	1,109	27	54	0.00	0.00	$1.95	$2.45

Segment	Measure	Electric Economic Potential (GWh)	Electric Achievable Potential 2012 (GWh)	Electric Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Total Cost of Deployed Measures (2012) ($1,000)	Total PV of Deployed Measures (2012) ($1,000)
Single Family	Room A/C Turn In	0.53	0.00	0.01	0	0	0	0.01	0.02	$0.37	$3.15
	Radiant Barrier (Ceiling) -- Room AC	0.15	0.00	0.01	0	0	0	0.01	0.02	$3.03	$6.65
	Air Conditioner - Central - Proper sizing	0.35	0.00	0.00	0	0	0	0.01	0.01	$0.18	$3.49
	Conditioned Space Design (Central heat)	0.00	0.00	0.00	0	0	849	0.00	0.00	$0.00	$0.00
	Conditioned Space Design (heat pump)	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Dryer Fuel Switch	6.91	0.00	0.17	(47,889)	0	(1,149)	0.00	0.05	$0.00	$0.00
	Energy Star Clothes Washer (w/ Gas WH & Gas Dryer)	0.00	0.00	0.00	3,760	5,367	10,664	0.00	0.00	$43.80	$45.40
	Energy Star Dehumidifer	0.07	0.00	0.02	0	0	0	0.00	0.01	$0.00	$0.00
	Energy Star Dishwasher (Electric Water Heating)	0.14	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (w/Gas DHW)	0.00	0.00	0.00	3,062	0	643	0.00	0.00	$0.00	$0.00
	Faucet aerator (Gas DHW) (3 per home)	0.00	0.00	0.00	17,925	3,988	10,556	0.00	0.00	$21.38	$28.87
	High Efficiency Boiler w/ indirect DHW	0.00	0.00	0.00	9,763	3,128	4,838	0.00	0.00	$37.06	$39.70
	High Efficiency Furnace - Natural Gas	0.00	0.00	0.00	31,465	3,538	3,512	0.00	0.00	$21.62	$44.90
	High Efficiency Water Heater - Natural Gas (EF=0.67)	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	LED Bulbs, purchased replacement (2018)	10.04	0.00	2.03	(32,347)	0	(6,996)	0.00	0.15	$0.00	$0.00
	Low Flow Showerhead (w/ Gas DHW)	0.00	0.00	0.00	155,234	25,479	67,655	0.00	0.00	$45.72	$200.36
	Programmable Thermostats - gas boiler	0.00	0.00	0.00	183,372	4,038	8,715	0.00	0.00	$3.44	$42.69
	Radiant Barrier (Ceiling)	0.00	0.00	0.00	389,150	17,235	45,509	0.00	0.00	$161.68	$269.81
	Range/Oven Fuel Switch	3.28	0.00	0.08	(17,066)	0	(410)	0.00	0.02	$0.00	$0.00
	Water heater tank wrap - Gas	0.00	0.00	0.00	79,074	4,421	11,759	0.00	0.00	$3.90	$34.76
	Water_Heater Thermostat Setback	0.00	0.00	0.00	0	579	1,249	0.00	0.00	$0.12	$2.55
	High Efficiency Water Heater - Natural Gas (EF=0.62)	(0.00)	(0.00)	(0.00)	510	137	137	(0.00)	(0.00)	$0.75	$1.18
	Whole-House Tankless Water Heater (Gas or LP)	(0.01)	(0.00)	(0.00)	33,147	14,327	28,508	(0.00)	(0.00)	$139.11	$182.99
	Dual Fuel Heat Pump	(0.26)	(0.03)	(0.04)	63,654	17,394	25,895	0.00	0.00	$99.82	$134.07
	Heat pump water heater replacement for gas water heater	(1.19)	(0.03)	(0.10)	315,986	20,999	62,881	(0.01)	(0.02)	$100.80	$147.68
	Ground Source Heat Pump	(35.21)	(0.50)	(0.49)	2,023,728	319,910	317,132	0.00	0.00	$2,396.65	$2,509.06

Segment	Measure	Electric Economic Potential (GWh)	Electric Achievable Potential 2012 (GWh)	Electric Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Total Cost of Deployed Measures (2012) ($1,000)	Total PV of Deployed Measures (2012) ($1,000)
Rental 1-4	CFL Bulbs, purchased replacement (2012)	10.64	2.50	0.00	(39,300)	(10,376)	0	0.19	0.00	$174.94	$419.09
	ECM Furnace	1.05	0.14	0.17	0	0	0	0.05	0.06	$34.77	$97.79
	Heating system fuel switch - Electric to Gas	100.49	0.23	0.39	(48,462)	(1,513)	(2,495)	0.00	0.00	$234.18	$47.06
	2-Stage Central AC	0.59	0.05	0.06	0	0	0	0.16	0.19	$85.71	$98.74
	Radiant Barrier (Ceiling) -- Central AC	3.41	0.04	0.10	0	0	0	0.12	0.32	$35.96	$92.54
	Energy Star Clothes Washer (w/ Elec. WH & Elec. Dryer)	0.85	0.03	0.06	0	0	0	0.01	0.01	$11.97	$18.05
	Direct load control of water heaters	7.66	0.02	0.04	0	0	0	0.00	0.01	$5.22	$10.23
	Heat Pump Water Heater	1.65	0.02	0.05	0	0	0	0.00	0.01	$13.22	$11.05
	Low Flow Showerhead	1.72	0.02	0.04	0	0	0	0.00	0.01	$1.66	$6.25
	Direct load control of air conditioners	4.51	0.01	0.03	0	0	0	0.04	0.09	$10.87	$18.41
	Home Electronics Efficiency Upgrade (Energy Star)	0.42	0.01	0.02	(1,320)	(40)	(62)	0.00	0.00	$1.07	$3.04
	Water Heater Blanket	0.77	0.01	0.02	0	0	0	0.00	0.00	$0.80	$3.93
	Shower Controls (Shower Start Technology)	3.04	0.01	0.02	0	0	0	0.00	0.00	$3.71	$3.62
	New Construction, Improved Plumbing Design	0.00	0.00	0.00	0	0	0	0.00	0.00	$3.00	$2.62
	Water Heater Setback	0.03	0.00	0.00	0	0	0	0.00	0.00	$0.03	$0.33
	Radiant Barrier (Ceiling) -- Central Heat	4.03	0.00	0.01	0	0	0	0.00	0.00	$3.18	$2.96
	Programmable Thermostats - gas furnace	0.16	0.00	0.00	346,046	3,384	7,300	0.00	0.00	$3.38	$34.07
	Energy Star Clothes Washer (w/ Elec. WH & NG Dryer)	0.01	0.00	0.00	1,196	13	27	0.00	0.00	$0.96	$1.21
	Room A/C Turn In	2.09	0.01	0.01	0	0	0	0.02	0.04	$0.84	$6.26
	Air Conditioner - Central - Proper sizing	0.08	0.00	0.00	0	0	0	0.00	0.00	$0.02	$0.41
	Conditioned Space Design (Central heat)	0.00	0.00	0.00	0	0	6	0.00	0.00	$0.00	$0.00
	Dryer Fuel Switch	1.80	0.00	0.02	(12,474)	0	(150)	0.00	0.01	$0.00	$0.00
	Energy Star Dehumidifer	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (Electric Water Heating)	0.08	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (w/Gas DHW)	0.00	0.00	0.00	329	0	62	0.00	0.00	$0.00	$0.00
	High Efficiency Boiler w/ indirect DHW	0.00	0.00	0.00	2,618	211	327	0.00	0.00	$2.04	$2.68
	High Efficiency Furnace - Natural Gas	0.00	0.00	0.00	36,511	1,144	1,143	0.00	0.00	$5.55	$14.52
	LED Bulbs, purchased replacement (2018)	1.52	0.00	0.31	(5,235)	0	(1,150)	0.00	0.02	$0.00	$0.00
	Low Flow Showerhead (w/ Gas DHW)	0.00	0.00	0.00	61,260	3,198	8,499	0.00	0.00	$5.45	$25.14
	Programmable Thermostats - gas boiler	0.00	0.00	0.00	27,896	272	587	0.00	0.00	$0.24	$2.87
	Radiant Barrier (Ceiling)	0.00	0.00	0.00	86,242	1,959	5,182	0.00	0.00	$26.07	$30.66
	Water heater tank wrap - Gas	0.00	0.00	0.00	22,219	555	1,475	0.00	0.00	$0.55	$4.36
	Water_Heater Thermostat Setback	0.00	0.00	0.00	0	70	150	0.00	0.00	$0.01	$0.31
	High Efficiency Water Heater - Natural Gas (EF=0.62)	(0.00)	(0.00)	(0.00)	51	46	46	(0.00)	(0.00)	$0.31	$0.39
	Whole-House Tankless Water Heater (Gas or LP)	(0.00)	(0.00)	(0.00)	8,028	3,599	7,180	(0.00)	(0.00)	$42.70	$45.91
	Dual Fuel Heat Pump	(0.71)	(0.04)	(0.05)	142,845	20,737	30,919	0.00	0.00	$130.25	$145.31
	Heat pump water heater replacement for gas water heater	(0.33)	(0.00)	(0.01)	91,417	3,012	9,029	(0.00)	(0.00)	$15.30	$21.46
	Boiler Controls-Gas	0.00	0.00	0.00	26,730	737	1,951	0.00	0.00	$2.58	$5.79
	Common Area Lighting Improvements in Multifamily	4.32	0.54	0.27	(28,590)	(3,985)	(1,985)	0.04	0.02	$18.52	$32.25
	Efficient Steam Boiler (MF) - gas	0.00	0.00	0.00	757	54	83	0.00	0.00	$0.45	$0.77
	Exit Lighting Improvements in Multifamily	0.39	0.00	0.01	(317)	(3)	(9)	0.00	0.00	$0.13	$1.07
	Faucet aerator (2 per home)	0.33	0.00	0.01	0	0	0	0.00	0.00	$1.14	$2.00
	Weatherization/direct install (High gas usage)	10.91	0.22	0.51	338,480	17,592	41,048	0.03	0.07	$440.97	$504.06
	Weatherization/direct install (Medium gas usage)	11.34	0.26	0.61	280,016	16,792	39,182	0.04	0.08	$522.11	$527.89

Segment	Measure	Electric Economic Potential (GWh)	Electric Achievable Potential 2012 (GWh)	Electric Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Total Cost of Deployed Measures (2012) ($1,000)	Total PV of Deployed Measures (2012) ($1,000)
Rental 5+	CFL Bulbs, purchased replacement (2012)	4.97	1.17	0.00	(20,120)	(4,993)	0	0.09	0.00	$85.58	$191.65
	ECM Furnace	0.49	0.06	0.08	0	0	0	0.02	0.03	$20.10	$45.99
	Radiant Barrier (Ceiling) -- Central AC	1.42	0.01	0.04	0	0	0	0.05	0.13	$22.15	$36.96
	Energy Star Clothes Washer (w/ Elec. WH & Elec. Dryer)	0.10	0.01	0.02	0	0	0	0.00	0.00	$2.35	$5.99
	Direct load control of water heaters	4.35	0.01	0.03	0	0	0	0.00	0.01	$3.09	$6.01
	Low Flow Showerhead	0.77	0.01	0.02	0	0	0	0.00	0.00	$0.92	$2.80
	Direct load control of air conditioners	2.81	0.01	0.02	0	0	0	0.02	0.05	$6.26	$10.57
	Home Electronics Efficiency Upgrade (Energy Star)	0.27	0.01	0.01	(778)	(25)	(38)	0.00	0.00	$0.67	$1.92
	Water Heater Blanket	0.31	0.00	0.01	0	0	0	0.00	0.00	$0.41	$1.74
	New Construction, Improved Plumbing Design	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.83	$1.85
	Water Heater Setback	0.03	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.14
	Programmable Thermostats - gas furnace	0.01	0.00	0.00	23,596	211	455	0.00	0.00	$0.24	$2.12
	Energy Star Clothes Washer (w/ Elec. WH & NG Dryer)	0.00	0.00	0.00	52	5	11	0.00	0.00	$0.18	$0.43
	Room A/C Turn In	0.31	0.00	0.00	0	0	0	0.00	0.01	$0.09	$0.91
	Air Conditioner - Central - Proper sizing	0.03	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.17
	Conditioned Space Design (Central heat)	0.00	0.00	0.00	0	0	2	0.00	0.00	$0.00	$0.00
	Energy Star Clothes Washer (w/ Gas WH & Gas Dryer)	0.00	0.00	0.00	832	354	702	0.00	0.00	$2.41	$2.99
	Energy Star Dehumidifer	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (w/Gas DHW)	0.00	0.00	0.00	191	0	23	0.00	0.00	$0.00	$0.00
	High Efficiency Furnace - Natural Gas	0.00	0.00	0.00	1,184	53	52	0.00	0.00	$0.44	$0.67
	LED Bulbs, purchased replacement (2018)	0.79	0.00	0.16	(3,424)	0	(711)	0.00	0.01	$0.00	$0.00
	Low Flow Showerhead (w/ Gas DHW)	0.00	0.00	0.00	13,583	1,187	3,149	0.00	0.00	$1.84	$9.33
	Programmable Thermostats - gas boiler	0.00	0.00	0.00	129,052	1,125	2,429	0.00	0.00	$1.07	$11.90
	Water heater tank wrap - Gas	0.00	0.00	0.00	1,842	51	137	0.00	0.00	$0.06	$0.40
	Water_Heater Thermostat Setback	0.00	0.00	0.00	0	25	54	0.00	0.00	$0.00	$0.11
	Boiler Controls-Gas	0.00	0.00	0.00	54,258	1,903	5,059	0.00	0.00	$2.17	$14.97
	Common Area Lighting Improvements in Multifamily	0.96	0.39	0.19	0	0	0	0.03	0.01	$13.21	$111.95
	Energy Star Clothes Washer (w/ Gas WH & Elec. Dryer)	0.06	0.01	0.01	1,559	428	855	0.00	0.00	$2.90	$6.42
	Energy Star Compliant Chest Freezer	0.00	0.00	0.00	(8)	(2)	(2)	0.00	0.00	$0.08	$0.19
	Energy Star Compliant Side-by-Side Refrigerator	0.00	0.00	0.00	(8)	(2)	(2)	0.00	0.00	$0.11	$0.27
	Energy Star Compliant Top-Mount Refrigerator	0.09	0.02	0.02	(386)	(94)	(94)	0.00	0.00	$3.72	$7.85
	Energy Star Compliant Upright Freezer (Manual Def.)	0.00	0.00	0.00	(6)	(1)	(1)	0.00	0.00	$0.06	$0.16
	Energy Star Room A/C	0.01	0.00	0.00	0	0	0	0.00	0.00	$0.11	$0.50
	Exit Lighting Improvements in Multifamily	0.14	0.00	0.01	0	0	0	0.00	0.00	$0.15	$1.40
	Faucet aerator (2 per home)	0.18	0.00	0.01	0	0	0	0.00	0.00	$0.89	$1.18
	High Efficiency Central AC (Tier 2)	0.10	0.01	0.02	0	0	0	0.03	0.05	$3.39	$16.69
	Hot Water Demand Recirculation	0.30	0.01	0.01	0	0	0	0.00	0.00	$3.53	$5.27
	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	0.00	0.00	0.00	4,973	333	519	0.00	0.00	$1.96	$4.22
	Mainline Air vent (MF) - gas	0.00	0.00	0.00	9,540	277	734	0.00	0.00	$1.00	$4.33
	Shower controls	0.00	0.00	0.00	20,817	423	1,125	0.00	0.00	$0.65	$3.33
	Smart Power Strip	1.34	0.01	0.04	(5,126)	(55)	(145)	0.00	0.01	$0.98	$2.04

Segment	Measure	Electric Economic Potential (GWh)	Electric Achievable Potential 2012 (GWh)	Electric Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)	2018 Demand Reduction (MW)	Total Cost of Deployed Measures (2012) ($1,000)	Total PV of Deployed Measures (2012) ($1,000)
Mobile Home	CFL Bulbs, purchased replacement (2012)	3.41	0.80	0.00	(13,482)	(3,465)	0	0.06	0.00	$56.17	$130.11
	ECM Furnace	0.24	0.06	0.08	0	0	0	0.02	0.03	$15.30	$44.85
	Radiant Barrier (Ceiling) -- Central AC	0.71	0.02	0.05	0	0	0	0.07	0.17	$21.94	$50.17
	Energy Star Clothes Washer (w/ Elec. WH & Elec. Dryer)	0.15	0.01	0.02	0	0	0	0.00	0.00	$4.18	$6.31
	Direct load control of water heaters	3.02	0.02	0.03	0	0	0	0.00	0.01	$4.19	$8.23
	Heat Pump Water Heater	0.41	0.01	0.04	0	0	0	0.00	0.01	$10.69	$9.50
	Low Flow Showerhead	0.73	0.01	0.03	0	0	0	0.00	0.01	$1.62	$5.36
	Direct load control of air conditioners	0.82	0.01	0.01	0	0	0	0.02	0.05	$5.79	$9.84
	Home Electronics Efficiency Upgrade (Energy Star)	0.09	0.01	0.01	(265)	(17)	(27)	0.00	0.00	$0.46	$1.34
	Water Heater Blanket	0.41	0.01	0.02	0	0	0	0.00	0.00	$0.67	$3.39
	Shower Controls (Shower Start Technology)	0.71	0.01	0.02	0	0	0	0.00	0.00	$3.05	$3.09
	Water Heater Setback	0.02	0.00	0.00	0	0	0	0.00	0.00	$0.03	$0.28
	Programmable Thermostats - gas furnace	0.09	0.00	0.00	153,496	2,319	5,005	0.00	0.00	$2.25	$23.41
	Energy Star Clothes Washer (w/ Elec. WH & NG Dryer)	0.00	0.00	0.00	16	2	4	0.00	0.00	$0.14	$0.17
	Room A/C Turn In	0.51	0.00	0.01	0	0	0	0.01	0.02	$0.37	$3.11
	Air Conditioner - Central - Proper sizing	0.02	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.22
	Conditioned Space Design (Central heat)	0.00	0.00	0.00	0	0	23	0.00	0.00	$0.00	$0.00
	Dryer Fuel Switch	0.37	0.00	0.01	(354)	0	(61)	0.00	0.00	$0.00	$0.00
	Energy Star Clothes Washer (w/ Gas WH & Gas Dryer)	0.00	0.00	0.00	1,110	632	1,258	0.00	0.00	$5.16	$5.35
	Energy Star Dehumidifer	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (Electric Water Heating)	0.02	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Energy Star Dishwasher (w/Gas DHW)	0.00	0.00	0.00	15	0	11	0.00	0.00	$0.00	$0.00
	High Efficiency Furnace - Natural Gas	0.00	0.00	0.00	10,352	357	354	0.00	0.00	$2.56	$4.53
	LED Bulbs, purchased replacement (2018)	0.54	0.00	0.11	(1,861)	0	(494)	0.00	0.01	$0.00	$0.00
	Low Flow Showerhead (w/ Gas DHW)	0.00	0.00	0.00	5,190	847	2,248	0.00	0.00	$1.30	$6.66
	Radiant Barrier (Ceiling)	0.00	0.00	0.00	29,237	1,579	4,176	0.00	0.00	$22.81	$24.72
	Water heater tank wrap - Gas	0.00	0.00	0.00	2,464	147	391	0.00	0.00	$0.17	$1.15
	Water_Heater Thermostat Setback	0.00	0.00	0.00	0	61	132	0.00	0.00	$0.01	$0.27
	High Efficiency Water Heater - Natural Gas (EF=0.62)	(0.00)	(0.00)	(0.00)	17	8	8	(0.00)	(0.00)	$0.07	$0.07
	Heat pump water heater replacement for gas water heater	(0.06)	(0.00)	(0.01)	17,311	1,131	3,388	(0.00)	(0.00)	$5.43	$7.96
	Duct Sealing (Outside Conditioned Space)- gas	0.20	0.00	0.00	156,134	3,040	6,520	0.01	0.01	$10.24	$23.27
	Faucet aerator (2 per home)	0.32	0.00	0.01	0	0	0	0.00	0.00	$1.16	$2.03
	Indirect-fired domestic water heater - NG boiler w/ EF = 0.65	0.00	0.00	0.00	1,094	238	369	0.00	0.00	$2.35	$3.02
Grand Total		**473.77**	**25.46**	**12.38**	**5,849,312**	**462,190**	**821,344**	**5.80**	**8.35**	**$8,502.65**	**$13,051.44**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Education	Lighting controls / design	10.07	0.61	1.10	-26,052	-1,643	-2,965	0.07	0.12	$51.48	$208.33
	HVAC RCx / Controls	6.92	0.32	0.38	326,124	15,661	19,818	0.40	0.48	$299.42	$600.70
	Lighting equipment	0.97	0.13	0.11	-2,455	-250	-274	0.01	0.01	$19.94	$36.24
	Cooling Equipment	1.27	0.09	0.15	108,185	4,951	9,903	0.11	0.18	$55.68	$108.65
	DHW System improvements	2.64	0.08	0.11	177,609	4,825	8,692	0.01	0.01	$20.19	$72.60
	Shell improvement	0.00	0.04	0.05	0	813	1,030	0.04	0.05	$61.85	$144.98
	Elec heating	0.95	0.03	0.08	-4,670	-199	-529	0.00	0.00	$2.17	$3.36
	Data / computing / office equip	0.51	0.02	0.03	-776	-28	-68	0.00	0.00	$4.14	$6.05
	Refrig - RCx / controls	0.17	0.01	0.02	0	0	0	0.00	0.00	$2.43	$4.37
	Faucets / Nozzles	0.18	0.01	0.02	9,954	1,286	2,185	0.00	0.00	$0.72	$8.01
	Refrig - Cooler/Freezer equip	0.31	0.01	0.01	0	0	0	0.00	0.00	$1.53	$3.97
	Process equip	0.16	0.00	0.00	-176	-2	-3	0.00	0.00	$0.27	$0.56
	Heat Recovery	0.00	0.00	0.00	0	177	276	0.00	0.00	$0.39	$1.77
	Process equip: cooking	0.05	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.02
	Dishwashing	0.04	0.00	0.00	30,644	22	108	0.00	0.00	$0.02	$0.19
	Clotheswashing	0.00	0.00	0.00	10,623	241	392	0.00	0.00	$0.84	$2.45
	Cooking	0.00	0.00	0.00	36,811	591	1,499	0.00	0.00	$1.12	$4.72
	Gas Heating Equip	0.00	0.00	0.00	91,424	1,252	2,016	0.00	0.00	$3.58	$13.88
	Pool	0.00	0.00	0.00	28,731	324	528	0.00	0.00	$0.21	$2.48
	Refrig - Displays	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
Education Total		24.23	1.35	2.07	785,976	28,022	42,608	0.65	0.87	$526.00	$1,223.33

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Food Sales	Lighting controls / design	1.19	0.03	0.06	-3,033	-71	-117	0.00	0.01	$5.69	$12.90
	HVAC RCx / Controls	1.48	0.05	0.06	27,646	889	1,067	0.05	0.06	$28.63	$41.76
	Lighting equipment	0.33	0.03	0.02	-501	-37	-47	0.00	0.00	$3.97	$7.81
	Cooling Equipment	0.63	0.03	0.05	17,129	784	1,568	0.03	0.05	$12.12	$30.51
	DHW System improvements	4.34	0.12	0.18	25,995	943	1,643	0.02	0.03	$157.06	$2,737.51
	Shell improvement	1.01	0.01	0.01	19,936	168	277	0.01	0.01	$17.08	$42.83
	Elec heating	0.67	0.02	0.06	-3,900	-141	-374	0.00	0.00	$1.53	$2.37
	Data / computing / office equip	0.03	0.00	0.00	-68	-2	-3	0.00	0.00	$0.15	$0.38
	Refrig - RCx / controls	4.94	0.49	0.67	0	0	0	0.07	0.10	$56.78	$175.69
	Faucets / Nozzles	0.10	0.00	0.01	1,671	225	380	0.00	0.00	$0.16	$1.91
	Refrig - Cooler/Freezer equip	5.03	0.19	0.37	0	0	0	0.03	0.05	$25.35	$106.91
	Process equip	0.13	0.00	0.00	-334	0	-1	0.00	0.00	$0.05	$0.08
	Heat Recovery	0.00	0.00	0.00	0	28	43	0.00	0.00	$0.15	$0.28
	Process equip: cooking	0.03	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.01
	Dishwashing	0.03	0.00	0.00	4,302	9	27	0.00	0.00	$0.01	$0.09
	Clotheswashing	0.00	0.00	0.00	2,749	67	110	0.00	0.00	$0.14	$0.69
	Cooking	0.00	0.00	0.00	8,598	131	333	0.00	0.00	$0.13	$1.05
	Gas Heating Equip	0.00	0.00	0.00	24,041	281	452	0.00	0.00	$0.70	$3.10
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	2.26	0.17	0.24	0	0	0	0.03	0.04	$27.84	$74.61
Food Sales Total		22.21	1.14	1.73	124,232	3,275	5,358	0.24	0.36	$337.55	$3,240.48

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Food Service	Lighting controls / design	1.86	0.03	0.05	-4,076	-66	-109	0.00	0.01	$3.23	$11.41
	HVAC RCx / Controls	3.32	0.14	0.16	78,047	3,873	4,677	0.13	0.15	$62.46	$228.30
	Lighting equipment	1.54	0.19	0.16	-3,997	-340	-435	0.03	0.02	$13.00	$46.81
	Cooling Equipment	0.98	0.04	0.07	37,221	1,704	3,407	0.03	0.06	$8.86	$33.83
	DHW System improvements	4.89	0.16	0.24	103,987	3,417	6,126	0.02	0.02	$112.65	$1,661.66
	Shell improvement	1.12	0.03	0.04	28,328	573	842	0.02	0.03	$38.31	$110.93
	Elec heating	0.69	0.02	0.06	-2,866	-145	-385	0.00	0.00	$1.45	$2.46
	Data / computing / office equip	0.03	0.00	0.00	-51	-2	-4	0.00	0.00	$0.14	$0.39
	Refrig - RCx / controls	3.62	0.26	0.38	0	0	0	0.01	0.02	$32.64	$90.54
	Faucets / Nozzles	0.31	0.02	0.04	6,318	869	1,468	0.00	0.00	$0.60	$7.94
	Refrig - Cooler/Freezer equip	3.66	0.09	0.14	0	0	0	0.00	0.01	$11.87	$48.22
	Process equip	0.15	0.00	0.00	-251	0	-2	0.00	0.00	$0.15	$0.23
	Heat Recovery	0.00	0.00	0.00	0	60	94	0.00	0.00	$0.35	$0.63
	Process equip: cooking	0.24	0.00	0.00	0	0	0	0.00	0.00	$0.04	$0.11
	Dishwashing	0.13	0.00	0.00	19,987	191	345	0.00	0.00	$0.32	$1.57
	Clotheswashing	0.00	0.00	0.00	16,486	454	724	0.00	0.00	$0.79	$4.20
	Cooking	0.00	0.00	0.00	70,767	1,021	2,591	0.00	0.00	$1.12	$8.16
	Gas Heating Equip	0.00	0.00	0.00	53,779	659	1,059	0.00	0.00	$1.73	$7.30
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	1.66	0.13	0.18	0	0	0	0.01	0.01	$22.21	$51.87
Food Service Total		24.20	1.11	1.53	403,679	12,268	20,399	0.25	0.33	$311.94	$2,316.56

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Health Care	Lighting controls / design	7.00	0.40	0.70	-14,822	-1,091	-1,887	0.06	0.10	$34.73	$141.09
	HVAC RCx / Controls	7.02	0.33	0.40	174,375	9,734	12,025	0.17	0.20	$182.12	$684.32
	Lighting equipment	1.31	0.40	0.36	-3,129	-1,050	-945	0.06	0.05	$90.24	$132.96
	Cooling Equipment	2.60	0.10	0.20	64,476	2,951	5,902	0.05	0.10	$23.20	$82.51
	DHW System improvements	3.93	0.09	0.13	221,872	5,910	10,644	0.01	0.02	$12.56	$87.67
	Shell improvement	1.80	0.05	0.06	47,590	992	1,459	0.02	0.03	$42.27	$169.59
	Elec heating	0.88	0.03	0.07	-3,746	-184	-488	0.00	0.00	$1.76	$3.11
	Data / computing / office equip	1.70	0.05	0.11	-2,952	-115	-244	0.01	0.02	$5.89	$20.76
	Refrig - RCx / controls	0.44	0.03	0.05	0	0	0	0.00	0.00	$2.65	$11.11
	Faucets / Nozzles	0.16	0.01	0.02	13,229	1,592	2,720	0.00	0.00	$0.52	$9.32
	Refrig - Cooler/Freezer equip	0.56	0.02	0.03	0	0	0	0.00	0.00	$2.77	$9.86
	Process equip	0.16	0.00	0.00	-288	-2	-4	0.00	0.00	$0.12	$0.30
	Heat Recovery	0.00	0.00	0.00	0	105	163	0.00	0.00	$0.39	$1.09
	Process equip: cooking	0.11	0.00	0.00	0	0	0	0.00	0.00	$0.44	$0.53
	Dishwashing	0.04	0.00	0.00	45,141	342	619	0.00	0.00	$0.37	$2.75
	Clotheswashing	0.00	0.00	0.00	39,295	815	1,301	0.00	0.00	$0.98	$7.54
	Cooking	0.00	0.00	0.00	31,611	542	1,375	0.00	0.00	$0.43	$4.33
	Gas Heating Equip	0.00	0.00	0.00	50,608	648	1,040	0.00	0.00	$1.88	$7.19
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.15	0.01	0.01	0	0	0	0.00	0.00	$0.79	$3.60
Health Care Total		27.85	1.52	2.14	663,260	21,190	33,680	0.38	0.53	$404.10	$1,379.65

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Lodging	Lighting controls / design	2.22	0.21	0.36	-4,503	-514	-891	0.02	0.04	$17.42	$71.19
	HVAC RCx / Controls	5.11	0.20	0.29	531,037	24,460	36,668	0.13	0.18	$131.41	$463.16
	Lighting equipment	6.14	1.11	0.81	-14,504	-2,055	-2,175	0.12	0.09	$89.82	$275.77
	Cooling Equipment	1.92	0.12	0.22	135,907	6,220	12,440	0.07	0.13	$27.21	$105.01
	DHW System improvements	3.96	0.16	0.31	274,385	8,174	14,717	0.02	0.04	$43.74	$136.81
	Shell improvement	0.97	0.02	0.03	105,086	2,160	3,182	0.01	0.02	$48.59	$184.22
	Elec heating	1.05	0.03	0.09	-4,123	-220	-585	0.00	0.00	$2.11	$3.72
	Data / computing / office equip	0.60	0.02	0.03	-931	-27	-51	0.00	0.00	$1.60	$6.27
	Refrig - RCx / controls	0.52	0.04	0.05	0	0	0	0.00	0.00	$3.17	$12.91
	Faucets / Nozzles	0.29	0.01	0.04	20,306	2,472	4,180	0.00	0.00	$1.39	$16.08
	Refrig - Cooler/Freezer equip	0.68	0.02	0.03	0	0	0	0.00	0.00	$3.31	$11.46
	Process equip	0.56	0.00	0.01	-697	-4	-9	0.00	0.00	$0.42	$1.00
	Heat Recovery	0.00	0.00	0.00	0	220	341	0.00	0.00	$0.82	$2.29
	Process equip: cooking	0.13	0.00	0.00	0	0	0	0.00	0.00	$0.52	$0.63
	Dishwashing	0.05	0.00	0.00	63,618	474	857	0.00	0.00	$0.51	$3.80
	Clotheswashing	0.00	0.00	0.00	55,155	1,128	1,800	0.00	0.00	$1.36	$10.44
	Cooking	0.00	0.00	0.00	28,804	489	1,242	0.00	0.00	$0.38	$3.91
	Gas Heating Equip	0.00	0.00	0.00	94,843	1,269	2,038	0.00	0.00	$3.45	$14.03
	Pool	0.00	0.00	0.00	62,457	549	895	0.00	0.00	$0.22	$4.20
	Refrig - Displays	0.18	0.01	0.02	0	0	0	0.00	0.00	$0.94	$4.18
Lodging Total		24.39	1.96	2.29	1,346,840	44,795	74,652	0.38	0.51	$378.42	$1,331.09

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Mercantile	Lighting controls / design	6.85	0.15	0.26	-16,291	-308	-511	0.03	0.05	$25.15	$60.88
	HVAC RCx / Controls	14.27	0.59	0.72	240,765	11,779	14,372	0.47	0.57	$332.35	$967.20
	Lighting equipment	5.94	0.96	0.71	-15,038	-1,732	-1,910	0.17	0.13	$84.62	$242.11
	Cooling Equipment	4.41	0.22	0.39	119,776	5,482	10,964	0.16	0.28	$72.44	$202.51
	DHW System improvements	5.56	0.13	0.20	183,939	4,613	8,343	0.02	0.04	$26.29	$96.23
	Shell improvement	4.58	0.10	0.14	91,400	1,844	2,710	0.07	0.10	$196.29	$457.31
	Elec heating	1.59	0.05	0.13	-6,774	-332	-882	0.00	0.00	$3.39	$5.61
	Data / computing / office equip	0.30	0.01	0.01	-465	-14	-26	0.00	0.00	$1.40	$3.30
	Refrig - RCx / controls	2.36	0.17	0.24	0	0	0	0.01	0.02	$25.13	$59.36
	Faucets / Nozzles	0.23	0.01	0.03	9,751	1,259	2,135	0.00	0.01	$0.66	$8.83
	Refrig - Cooler/Freezer equip	2.34	0.06	0.09	0	0	0	0.00	0.01	$8.91	$31.60
	Process equip	0.17	0.00	0.00	-293	0	-2	0.00	0.00	$0.13	$0.20
	Dishwashing	0.00	0.00	0.00	36,611	275	496	0.00	0.00	$0.52	$2.19
	Clotheswashing	0.00	0.00	0.00	30,197	653	1,042	0.00	0.00	$1.36	$6.05
	Cooking	0.00	0.00	0.00	47,913	730	1,853	0.00	0.00	$0.95	$5.83
	Gas Heating Equip	0.00	0.00	0.00	134,641	1,779	2,878	0.00	0.00	$5.53	$19.65
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.69	0.04	0.06	0	0	0	0.00	0.00	$3.14	$12.90
Mercantile Total		49.30	2.49	2.99	856,135	26,028	41,461	0.95	1.19	$788.28	$2,181.76

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Office	Lighting controls / design	19.33	0.99	1.65	-52,672	-2,625	-4,355	0.19	0.31	$110.54	$366.04
	HVAC RCx / Controls	16.38	0.82	0.98	342,496	19,097	23,489	0.44	0.52	$804.15	$1,494.12
	Lighting equipment	1.76	0.24	0.21	-4,907	-453	-527	0.05	0.04	$30.23	$66.04
	Cooling Equipment	3.95	0.19	0.34	141,413	6,472	12,944	0.09	0.17	$88.79	$168.56
	DHW System improvements	0.97	0.06	0.08	209,695	5,573	10,069	0.01	0.01	$13.76	$69.81
	Shell improvement	0.00	0.06	0.08	0	995	1,243	0.03	0.04	$112.30	$281.57
	Elec heating	2.37	0.07	0.20	-11,374	-497	-1,323	0.00	0.00	$5.36	$8.39
	Data / computing / office equip	13.28	0.45	0.86	-18,368	-638	-1,356	0.09	0.16	$113.31	$192.35
	Refrig - RCx / controls	0.25	0.02	0.03	0	0	0	0.00	0.00	$4.38	$7.81
	Faucets / Nozzles	0.15	0.01	0.02	11,683	1,502	2,537	0.00	0.00	$0.57	$8.75
	Refrig - Cooler/Freezer equip	0.38	0.01	0.01	0	0	0	0.00	0.00	$1.78	$4.86
	Process equip	1.89	0.03	0.07	-1,576	-2	-8	0.00	0.01	$7.51	$12.29
	Heat Recovery	0.00	0.00	0.00	0	230	359	0.00	0.00	$1.23	$2.34
	Dishwashing	0.00	0.00	0.00	35,834	26	127	0.00	0.00	$0.02	$0.21
	Clotheswashing	0.00	0.00	0.00	27,763	648	1,027	0.00	0.00	$1.48	$5.79
	Cooking	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Gas Heating Equip	0.00	0.00	0.00	147,407	2,056	3,344	0.00	0.00	$8.55	$22.80
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.11	0.01	0.01	0	0	0	0.00	0.00	$0.72	$2.13
Office Total		60.83	2.96	4.53	827,395	32,385	47,570	0.90	1.27	$1,304.68	$2,713.84

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Other (incl. Lab	Lighting controls / design	1.09	0.06	0.11	-2,824	-169	-280	0.01	0.02	$6.99	$24.10
	HVAC RCx / Controls	1.34	0.05	0.07	66,539	3,280	4,037	0.05	0.06	$30.67	$91.01
	Lighting equipment	0.25	0.03	0.03	-638	-59	-74	0.01	0.01	$3.08	$8.36
	Cooling Equipment	0.32	0.01	0.03	32,455	1,485	2,971	0.01	0.02	$5.28	$14.72
	DHW System improvements	1.41	0.03	0.04	66,606	2,221	3,992	0.00	0.01	$19.05	$195.31
	Shell improvement	0.44	0.01	0.01	24,066	515	759	0.01	0.01	$18.75	$44.12
	Elec heating	0.43	0.01	0.04	-1,785	-90	-238	0.00	0.00	$0.91	$1.51
	Data / computing / office equip	6.09	0.30	0.49	-93	-3	-5	0.05	0.09	$48.78	$144.90
	Refrig - RCx / controls	0.82	0.07	0.09	0	0	0	0.01	0.01	$10.02	$25.07
	Faucets / Nozzles	0.05	0.00	0.01	4,380	581	982	0.00	0.00	$0.18	$3.24
	Refrig - Cooler/Freezer equip	1.11	0.03	0.04	0	0	0	0.00	0.00	$4.28	$15.32
	Process equip	0.07	0.00	0.00	-54	-1	-1	0.00	0.00	$0.20	$0.39
	Process equip: cooking	0.25	0.00	0.00	0	0	0	0.00	0.00	$0.04	$0.12
	Dishwashing	0.18	0.00	0.00	16,309	127	229	0.00	0.00	$0.27	$1.07
	Clotheswashing	0.00	0.00	0.00	11,012	301	480	0.00	0.00	$0.63	$2.79
	Cooking	0.00	0.00	0.00	10,019	44	83	0.00	0.00	$0.02	$0.35
	Gas Heating Equip	0.00	0.00	0.00	30,025	436	708	0.00	0.00	$1.33	$4.81
	Pool	0.11	0.00	0.01	0	0	0	0.00	0.00	$0.47	$0.57
	Refrig - Displays	0.39	0.02	0.04	0	0	0	0.00	0.00	$3.53	$9.33
Other (incl. Labs) Total		14.34	0.65	1.00	256,018	8,670	13,644	0.16	0.23	$154.49	$587.09

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Public Assemb	Lighting controls / design	3.87	0.19	0.33	-10,584	-517	-858	0.03	0.06	$22.06	$72.23
	HVAC RCx / Controls	3.83	0.14	0.17	138,979	5,401	6,690	0.13	0.15	$82.73	$193.83
	Lighting equipment	0.68	0.06	0.07	-1,853	-164	-198	0.01	0.01	$7.68	$16.80
	Cooling Equipment	0.86	0.04	0.07	65,684	3,006	6,012	0.03	0.06	$17.56	$38.24
	DHW System improvements	0.60	0.04	0.05	121,728	2,852	5,159	0.01	0.01	$7.98	$39.21
	Shell improvement	0.00	0.02	0.03	0	493	624	0.02	0.02	$35.93	$81.28
	Elec heating	0.56	0.02	0.05	-2,668	-116	-309	0.00	0.00	$1.27	$1.96
	Data / computing / office equip	0.21	0.01	0.01	-331	-9	-18	0.00	0.00	$1.46	$2.31
	Refrig - RCx / controls	0.12	0.01	0.01	0	0	0	0.00	0.00	$2.13	$3.72
	Faucets / Nozzles	0.10	0.01	0.01	5,791	773	1,305	0.00	0.00	$0.35	$4.83
	Refrig - Cooler/Freezer equip	0.23	0.00	0.01	0	0	0	0.00	0.00	$0.86	$2.32
	Process equip	0.17	0.00	0.00	-300	-1	-3	0.00	0.00	$0.26	$0.42
	Heat Recovery	0.00	0.00	0.00	0	107	167	0.00	0.00	$0.23	$1.07
	Process equip: cooking	0.29	0.00	0.00	0	0	0	0.00	0.00	$0.07	$0.14
	Dishwashing	0.21	0.00	0.00	9,096	156	242	0.00	0.00	$0.52	$1.32
	Clotheswashing	0.00	0.00	0.00	14,186	333	528	0.00	0.00	$0.82	$2.98
	Cooking	0.00	0.00	0.00	15,898	314	830	0.00	0.00	$0.65	$2.51
	Gas Heating Equip	0.00	0.00	0.00	65,273	717	1,142	0.00	0.00	$2.64	$7.91
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.06	0.00	0.00	0	0	0	0.00	0.00	$0.35	$1.01
Public Assembly Total		11.79	0.54	0.81	420,900	13,344	21,315	0.24	0.32	$185.56	$474.09

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Public Order ar	Lighting controls / design	0.25	0.02	0.03	-642	-40	-67	0.00	0.00	$1.70	$5.50
	HVAC RCx / Controls	0.97	0.04	0.04	21,787	903	1,111	0.03	0.04	$17.71	$45.60
	Lighting equipment	0.06	0.01	0.01	-140	-16	-18	0.00	0.00	$0.71	$1.79
	Cooling Equipment	0.19	0.01	0.02	10,818	495	990	0.01	0.02	$6.80	$14.77
	DHW System improvements	-0.03	0.00	0.00	30,264	709	1,283	0.00	0.00	$0.72	$5.73
	Shell improvement	0.48	0.02	0.03	12,291	380	872	0.01	0.03	$61.87	$189.23
	Elec heating	0.19	0.01	0.02	-765	-39	-102	0.00	0.00	$0.42	$0.65
	Data / computing / office equip	0.17	0.01	0.02	-289	-14	-36	0.00	0.00	$1.11	$2.77
	Refrig - RCx / controls	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Faucets / Nozzles	0.00	0.00	0.00	1,457	192	325	0.00	0.00	$0.04	$0.89
	Refrig - Cooler/Freezer equip	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Process equip	0.13	0.00	0.00	-250	-3	-5	0.00	0.00	$0.28	$0.42
	Heat Recovery	0.00	0.00	0.00	0	18	28	0.00	0.00	$0.04	$0.18
	Process equip: cooking	0.02	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.01
	Dishwashing	0.02	0.00	0.00	2,263	39	60	0.00	0.00	$0.12	$0.32
	Clotheswashing	0.00	0.00	0.00	3,529	83	131	0.00	0.00	$0.20	$0.74
	Cooking	0.00	0.00	0.00	5,036	99	263	0.00	0.00	$0.21	$0.79
	Gas Heating Equip	0.00	0.00	0.00	9,566	118	187	0.00	0.00	$0.45	$1.30
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
Public Order and Safety Total		2.44	0.10	0.17	94,925	2,924	5,022	0.06	0.09	$92.37	$270.69

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Religious Wors	Lighting controls / design	2.64	0.12	0.20	-6,773	-314	-521	0.02	0.04	$13.51	$43.99
	HVAC RCx / Controls	2.09	0.08	0.09	110,252	4,478	5,525	0.07	0.08	$38.97	$97.64
	Lighting equipment	0.42	0.04	0.05	-1,075	-99	-120	0.01	0.01	$4.43	$10.20
	Cooling Equipment	0.47	0.02	0.04	55,058	2,520	5,040	0.02	0.03	$8.15	$20.55
	DHW System improvements	0.30	0.02	0.02	101,974	2,391	4,324	0.00	0.00	$5.09	$28.07
	Shell improvement	1.04	0.02	0.02	62,503	876	1,292	0.01	0.02	$53.34	$155.70
	Elec heating	0.30	0.01	0.03	-1,247	-63	-167	0.00	0.00	$0.69	$1.06
	Data / computing / office equip	0.11	0.00	0.01	-204	-5	-9	0.00	0.00	$0.49	$1.22
	Refrig - RCx / controls	0.06	0.01	0.01	0	0	0	0.00	0.00	$1.14	$2.00
	Faucets / Nozzles	0.06	0.00	0.01	4,909	648	1,094	0.00	0.00	$0.24	$3.67
	Refrig - Cooler/Freezer equip	0.17	0.00	0.01	0	0	0	0.00	0.00	$0.67	$2.14
	Process equip	0.08	0.00	0.00	-162	-1	-2	0.00	0.00	$0.07	$0.11
	Heat Recovery	0.00	0.00	0.00	0	90	140	0.00	0.00	$0.20	$0.90
	Process equip: cooking	0.02	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.01
	Dishwashing	0.01	0.00	0.00	7,625	131	203	0.00	0.00	$0.40	$1.05
	Clotheswashing	0.00	0.00	0.00	11,891	280	443	0.00	0.00	$0.69	$2.50
	Cooking	0.00	0.00	0.00	901	1	4	0.00	0.00	$0.00	$0.01
	Gas Heating Equip	0.00	0.00	0.00	48,396	600	955	0.00	0.00	$2.27	$6.62
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.03	0.00	0.00	0	0	0	0.00	0.00	$0.19	$0.55
Religious Worship Total		7.80	0.32	0.47	394,050	11,531	18,201	0.13	0.19	$130.53	$378.00

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Service (light m	Lighting controls / design	5.41	0.28	0.47	-13,217	-733	-1,215	0.05	0.08	$30.38	$104.93
	HVAC RCx / Controls	5.18	0.21	0.26	124,090	5,876	7,240	0.18	0.22	$119.37	$354.12
	Lighting equipment	1.07	0.17	0.14	-2,677	-387	-376	0.03	0.03	$20.51	$52.62
	Cooling Equipment	0.71	0.03	0.05	57,956	2,653	5,305	0.02	0.04	$6.30	$21.78
	DHW System improvements	2.47	0.06	0.08	162,130	3,801	6,875	0.01	0.01	$12.62	$55.44
	Shell improvement	1.70	0.04	0.06	44,382	921	1,357	0.03	0.05	$73.42	$172.42
	Elec heating	0.67	0.02	0.06	-2,888	-141	-374	0.00	0.00	$1.43	$2.37
	Data / computing / office equip	0.64	0.02	0.03	-996	-29	-54	0.00	0.01	$2.95	$6.98
	Refrig - RCx / controls	0.89	0.06	0.09	0	0	0	0.01	0.01	$9.46	$22.56
	Faucets / Nozzles	0.10	0.01	0.01	7,805	1,030	1,740	0.00	0.00	$0.34	$6.02
	Refrig - Cooler/Freezer equip	0.88	0.02	0.03	0	0	0	0.00	0.00	$3.35	$12.01
	Process equip	0.34	0.00	0.00	-623	-1	-4	0.00	0.00	$0.11	$0.17
	Dishwashing	0.00	0.00	0.00	12,123	208	323	0.00	0.00	$0.42	$1.66
	Clotheswashing	0.00	0.00	0.00	24,878	538	858	0.00	0.00	$1.12	$4.98
	Cooking	0.00	0.00	0.00	1,976	2	9	0.00	0.00	$0.00	$0.02
	Gas Heating Equip	0.00	0.00	0.00	60,115	836	1,356	0.00	0.00	$2.54	$9.25
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
	Refrig - Displays	0.26	0.01	0.02	0	0	0	0.00	0.00	$1.18	$4.90
Service (light mfg) Total		20.32	0.93	1.31	475,055	14,574	23,039	0.34	0.46	$285.52	$832.24

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
Warehouse an	Lighting controls / design	3.83	0.24	0.45	-10,457	-645	-1,186	0.07	0.13	$28.25	$105.12
	HVAC RCx / Controls	4.60	0.19	0.23	177,891	8,181	9,952	0.48	0.58	$149.03	$372.72
	Lighting equipment	0.77	0.12	0.11	-1,840	-298	-290	0.03	0.03	$20.86	$40.12
	Cooling Equipment	0.54	0.03	0.06	80,752	3,696	7,392	0.08	0.14	$15.35	$48.15
	DHW System improvements	0.69	0.02	0.03	50,192	2,079	3,743	0.01	0.01	$16.30	$129.73
	Shell improvement	0.00	0.02	0.02	0	566	706	0.04	0.06	$31.18	$91.75
	Elec heating	1.18	0.04	0.10	-5,001	-247	-657	0.00	0.00	$2.67	$4.17
	Data / computing / office equip	0.23	0.01	0.01	-336	-10	-19	0.00	0.00	$1.43	$2.62
	Refrig - RCx / controls	6.05	0.52	0.77	0	0	0	0.19	0.29	$84.83	$189.05
	Faucets / Nozzles	0.04	0.00	0.01	4,290	546	923	0.00	0.00	$0.17	$3.01
	Refrig - Cooler/Freezer equip	11.14	0.29	0.44	0	0	0	0.11	0.17	$58.10	$177.96
	Process equip	0.15	0.00	0.00	-219	0	-1	0.00	0.00	$0.11	$0.23
	Heat Recovery	0.00	0.00	0.00	0	131	204	0.00	0.00	$0.70	$1.36
	Dishwashing	0.00	0.00	0.00	13,164	10	47	0.00	0.00	$0.01	$0.08
	Clotheswashing	0.00	0.00	0.00	9,195	240	382	0.00	0.00	$0.55	$2.15
	Cooking	0.00	0.00	0.00	2,083	10	20	0.00	0.00	$0.01	$0.08
	Gas Heating Equip	0.00	0.00	0.00	74,008	1,146	1,854	0.00	0.00	$5.02	$12.61
	Pool	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.01	$0.01
	Refrig - Displays	0.17	0.01	0.01	0	0	0	0.00	0.01	$1.06	$3.80
Warehouse and Storage Total		29.39	1.48	2.24	393,721	15,404	23,069	1.02	1.41	$415.62	$1,184.71

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	Demand Savings 2012 (MW)	Demand Savings 2018 (MW)	Total Cost of Deployed Measures ($1000)	Total PV of Benefits ($1000)
(blank)	(blank)	0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
(blank) Total		0.00	0.00	0.00	0	0	0	0.00	0.00	$0.00	$0.00
Grand Total		**319.08**	**16.55**	**23.29**	**7,042,186**	**234,409**	**370,016**	**5.70**	**7.74**	**$5,315.05**	**$18,113.54**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Food	Process Motors - VSD, Motor Optimization and Efficient Motors	4.22	0.26	0.34	0	0	0	0.037
	Process Motors - System Component Improvement and Replace	4.13	0.11	0.26	0	0	0	0.016
	Process Cooling - VSD, Motor Optimization and Efficient Motors	9.27	0.55	0.73	0	0	0	0.079
	Lighting - Equipment Upgrades and Replacement	3.34	0.26	0.46	(265)	(17)	(30)	0.037
	Lighting - Efficient System Design and Controls	2.14	0.10	0.24	(196)	(5)	(13)	0.014
	Process Cooling - Improved Operations and Maintenance	5.35	0.15	0.39	0	0	0	0.021
	Motors - Process Management and Continuous Improvement	5.22	0.04	0.06	0	0	0	0.005
	Motors - Improved Controls and Sensors	0.18	0.03	0.06	0	0	0	0.005
	HVAC - Improved Operations and Maintenance	1.14	0.05	0.12	0	0	0	0.007
	HVAC - Efficient System Design and Controls	4.54	0.04	0.07	0	0	0	0.006
	Motors - Improved Operations and Maintenance	1.30	0.03	0.09	0	0	0	0.005
	HVAC - Insulation and Sealing of System Components	1.28	0.03	0.08	0	0	0	0.004
	Other - System Component Improvement and Replacement	0.42	0.01	0.02	0	0	0	0.001
	Process Cooling - Equipment Upgrades and Replacement	2.25	0.04	0.11	0	0	0	0.006
	Process Cooling - Efficient System Design and Controls	1.28	0.03	0.09	0	0	0	0.005
	HVAC - Cooling - Efficient System Design and Controls	0.40	0.01	0.03	0	0	0	0.002
	HVAC - Cooling - Equipment Upgrades and Replacement	1.23	0.01	0.02	0	0	0	0.002
	Process Heating (E) - Process Controls	0.08	0.00	0.01	0	0	0	0.001
	Other - Improved Operations and Maintenance	0.07	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.11	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Heat Containment Improvements	0.03	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.07	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.22	0.01	0.01	0	0	0	0.001
	Air Compression - Equipment Upgrades and Replacement	0.48	0.01	0.01	0	0	0	0.001
	Air Compression - Variable Speed Drives and Motor Upgrades	0.03	0.01	0.01	0	0	0	0.001
	Air Compression - Efficient System Design and Controls	0.15	0.00	0.01	0	0	0	0.001
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	8,554	133	246	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	1,658	35	94	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	3,110	141	243	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	5,739	218	579	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	2,395	131	346	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	107,859	1,347	2,768	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	100,542	2,876	6,705	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	11,814	276	730	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	53,710	2,048	5,429	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	25,895	1,002	2,030	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	75,509	2,305	2,524	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Food	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	97,473	3,698	8,708	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	45,596	6,773	6,871	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	4,209	505	1,341	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	56,222	985	2,029	0.000
Food Total		**48.93**	**1.77**	**3.25**	**599,822**	**22,452**	**40,599**	**0.255**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Chemicals	Process Motors - VSD, Motor Optimization and Efficient Motors	7.56	0.51	0.68	0	0	0	0.063
	Process Motors - System Component Improvement and Replace	10.58	0.23	0.57	0	0	0	0.029
	Process Cooling - VSD, Motor Optimization and Efficient Motors	3.33	0.20	0.26	0	0	0	0.024
	Lighting - Equipment Upgrades and Replacement	2.51	0.18	0.34	(266)	(16)	(30)	0.023
	Lighting - Efficient System Design and Controls	2.00	0.07	0.17	(182)	(5)	(12)	0.008
	Process Cooling - Improved Operations and Maintenance	1.92	0.05	0.14	0	0	0	0.007
	Motors - Process Management and Continuous Improvement	6.40	0.04	0.07	0	0	0	0.005
	Motors - Improved Controls and Sensors	0.22	0.04	0.07	0	0	0	0.005
	HVAC - Improved Operations and Maintenance	0.94	0.04	0.10	0	0	0	0.005
	HVAC - Efficient System Design and Controls	3.76	0.03	0.06	0	0	0	0.004
	Motors - Improved Operations and Maintenance	1.27	0.03	0.07	0	0	0	0.003
	HVAC - Insulation and Sealing of System Components	1.06	0.03	0.07	0	0	0	0.003
	Other - System Component Improvement and Replacement	1.34	0.02	0.06	0	0	0	0.003
	Process Cooling - Equipment Upgrades and Replacement	0.81	0.01	0.04	0	0	0	0.002
	Process Cooling - Efficient System Design and Controls	0.46	0.01	0.03	0	0	0	0.002
	HVAC - Cooling - Efficient System Design and Controls	0.36	0.01	0.03	0	0	0	0.001
	HVAC - Cooling - Equipment Upgrades and Replacement	1.11	0.01	0.02	0	0	0	0.001
	Process Heating (E) - Process Controls	0.08	0.00	0.01	0	0	0	0.000
	Other - Improved Operations and Maintenance	0.21	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.12	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Heat Containment Improvements	0.03	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.06	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.24	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Variable Speed Drives and Motor Upgrades	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Efficient System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	7,386	115	212	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	1,431	31	81	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	2,685	122	210	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	4,955	188	500	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	2,068	113	299	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	306,780	4,168	8,176	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	280,409	7,988	18,636	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	39,337	899	2,378	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	128,337	4,926	13,057	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	73,041	2,784	5,640	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	244,970	7,516	8,222	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	337,126	14,763	35,553	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Chemicals	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	148,130	22,093	22,401	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	13,682	1,648	4,372	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	183,423	3,215	6,616	0.000
Chemicals Total		**46.36**	**1.53**	**2.83**	**1,773,313**	**70,548**	**126,312**	**0.189**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Metals Primary	Process Motors - VSD, Motor Optimization and Efficient Motors	1.70	0.10	0.14	0	0	0	0.014
	Process Motors - System Component Improvement and Replace	1.69	0.04	0.10	0	0	0	0.006
	Process Cooling - VSD, Motor Optimization and Efficient Motors	0.18	0.01	0.01	0	0	0	0.001
	Lighting - Equipment Upgrades and Replacement	0.78	0.06	0.11	(162)	(11)	(19)	0.009
	Lighting - Efficient System Design and Controls	0.58	0.03	0.06	(139)	(4)	(9)	0.003
	Process Cooling - Improved Operations and Maintenance	0.11	0.00	0.01	0	0	0	0.000
	Motors - Process Management and Continuous Improvement	2.06	0.01	0.02	0	0	0	0.002
	Motors - Improved Controls and Sensors	0.07	0.01	0.02	0	0	0	0.002
	HVAC - Improved Operations and Maintenance	0.34	0.01	0.04	0	0	0	0.002
	HVAC - Efficient System Design and Controls	1.34	0.01	0.02	0	0	0	0.002
	Motors - Improved Operations and Maintenance	0.50	0.01	0.03	0	0	0	0.002
	HVAC - Insulation and Sealing of System Components	0.38	0.01	0.02	0	0	0	0.001
	Other - System Component Improvement and Replacement	1.27	0.02	0.06	0	0	0	0.003
	Process Cooling - Equipment Upgrades and Replacement	0.04	0.00	0.00	0	0	0	0.000
	Process Cooling - Efficient System Design and Controls	0.03	0.00	0.00	0	0	0	0.000
	HVAC - Cooling - Efficient System Design and Controls	0.13	0.00	0.01	0	0	0	0.001
	HVAC - Cooling - Equipment Upgrades and Replacement	0.41	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Process Controls	0.37	0.02	0.05	0	0	0	0.003
	Other - Improved Operations and Maintenance	0.20	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.60	0.01	0.03	0	0	0	0.002
	Process Heating (E) - Heat Containment Improvements	0.16	0.01	0.02	0	0	0	0.001
	Process Heating (E) - Equipment Upgrades and Replacement	0.15	0.00	0.01	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.22	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.09	0.00	0.01	0	0	0	0.000
	Air Compression - Equipment Upgrades and Replacement	0.21	0.00	0.01	0	0	0	0.000
	Air Compression - Variable Speed Drives and Motor Upgrades	0.01	0.00	0.00	0	0	0	0.000
	Air Compression - Efficient System Design and Controls	0.07	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	32,596	506	937	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	6,317	135	359	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	11,849	539	927	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	21,867	830	2,204	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	9,124	498	1,320	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	449,894	6,659	13,931	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	785,796	23,305	54,385	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	308,079	11,064	28,158	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	486,372	19,341	51,300	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Metals Primary	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	319,514	6,180	13,283	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	61,078	1,864	2,041	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	78,845	2,991	7,044	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	36,882	5,478	5,558	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	3,405	409	1,084	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	45,477	797	1,641	0.000
Metals Primary Total		**13.69**	**0.42**	**0.83**	**2,656,796**	**80,582**	**184,145**	**0.056**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Fabricated Me	Process Motors - VSD, Motor Optimization and Efficient Motors	1.67	0.11	0.14	0	0	0	0.016
	Process Motors - System Component Improvement and Replace	2.43	0.06	0.13	0	0	0	0.008
	Process Cooling - VSD, Motor Optimization and Efficient Motors	0.50	0.03	0.04	0	0	0	0.004
	Lighting - Equipment Upgrades and Replacement	1.79	0.14	0.25	(155)	(10)	(18)	0.021
	Lighting - Efficient System Design and Controls	1.16	0.05	0.13	(115)	(3)	(8)	0.008
	Process Cooling - Improved Operations and Maintenance	0.29	0.01	0.02	0	0	0	0.001
	Motors - Process Management and Continuous Improvement	1.75	0.01	0.02	0	0	0	0.002
	Motors - Improved Controls and Sensors	0.06	0.01	0.02	0	0	0	0.002
	HVAC - Improved Operations and Maintenance	0.54	0.02	0.06	0	0	0	0.003
	HVAC - Efficient System Design and Controls	2.15	0.02	0.04	0	0	0	0.003
	Motors - Improved Operations and Maintenance	0.43	0.01	0.03	0	0	0	0.002
	HVAC - Insulation and Sealing of System Components	0.61	0.01	0.04	0	0	0	0.002
	Other - System Component Improvement and Replacement	0.20	0.00	0.01	0	0	0	0.001
	Process Cooling - Equipment Upgrades and Replacement	0.12	0.00	0.01	0	0	0	0.000
	Process Cooling - Efficient System Design and Controls	0.07	0.00	0.00	0	0	0	0.000
	HVAC - Cooling - Efficient System Design and Controls	0.22	0.01	0.02	0	0	0	0.001
	HVAC - Cooling - Equipment Upgrades and Replacement	0.69	0.01	0.01	0	0	0	0.001
	Process Heating (E) - Process Controls	0.19	0.01	0.03	0	0	0	0.002
	Other - Improved Operations and Maintenance	0.03	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.31	0.01	0.02	0	0	0	0.001
	Process Heating (E) - Heat Containment Improvements	0.08	0.00	0.01	0	0	0	0.001
	Process Heating (E) - Equipment Upgrades and Replacement	0.08	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.04	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.15	0.01	0.01	0	0	0	0.001
	Air Compression - Equipment Upgrades and Replacement	0.33	0.00	0.01	0	0	0	0.001
	Air Compression - Variable Speed Drives and Motor Upgrades	0.02	0.00	0.00	0	0	0	0.001
	Air Compression - Efficient System Design and Controls	0.10	0.00	0.01	0	0	0	0.000
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	5,744	89	165	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	1,113	24	63	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	2,088	95	163	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	3,853	146	388	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	1,608	88	233	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	8,495	133	243	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	38,260	1,055	2,465	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	1,396	31	82	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	2,234	88	234	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	11,702	368	747	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Fabricated Me	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	0	0	0	0.000
Fabricated Metals Total		**16.00**	**0.54**	**1.06**	**76,222**	**2,104**	**4,758**	**0.082**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Machinery	Process Motors - VSD, Motor Optimization and Efficient Motors	2.48	0.16	0.21	0	0	0	0.026
	Process Motors - System Component Improvement and Replace	3.60	0.08	0.20	0	0	0	0.013
	Process Cooling - VSD, Motor Optimization and Efficient Motors	0.63	0.04	0.05	0	0	0	0.006
	Lighting - Equipment Upgrades and Replacement	3.64	0.27	0.50	(447)	(28)	(51)	0.045
	Lighting - Efficient System Design and Controls	3.06	0.10	0.25	(321)	(9)	(21)	0.017
	Process Cooling - Improved Operations and Maintenance	0.36	0.01	0.03	0	0	0	0.002
	Motors - Process Management and Continuous Improvement	2.60	0.02	0.03	0	0	0	0.003
	Motors - Improved Controls and Sensors	0.09	0.02	0.03	0	0	0	0.003
	HVAC - Improved Operations and Maintenance	1.32	0.05	0.14	0	0	0	0.009
	HVAC - Efficient System Design and Controls	5.28	0.05	0.09	0	0	0	0.007
	Motors - Improved Operations and Maintenance	0.63	0.02	0.04	0	0	0	0.003
	HVAC - Insulation and Sealing of System Components	1.48	0.04	0.09	0	0	0	0.006
	Other - System Component Improvement and Replacement	0.20	0.00	0.01	0	0	0	0.001
	Process Cooling - Equipment Upgrades and Replacement	0.15	0.00	0.01	0	0	0	0.000
	Process Cooling - Efficient System Design and Controls	0.09	0.00	0.01	0	0	0	0.000
	HVAC - Cooling - Efficient System Design and Controls	0.55	0.02	0.05	0	0	0	0.003
	HVAC - Cooling - Equipment Upgrades and Replacement	1.69	0.02	0.03	0	0	0	0.002
	Process Heating (E) - Process Controls	0.08	0.00	0.01	0	0	0	0.001
	Other - Improved Operations and Maintenance	0.03	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.13	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Heat Containment Improvements	0.03	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.03	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.04	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.28	0.01	0.02	0	0	0	0.002
	Air Compression - Equipment Upgrades and Replacement	0.61	0.01	0.02	0	0	0	0.002
	Air Compression - Variable Speed Drives and Motor Upgrades	0.04	0.01	0.01	0	0	0	0.001
	Air Compression - Efficient System Design and Controls	0.19	0.01	0.01	0	0	0	0.001
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	14,387	224	414	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	2,788	60	158	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	5,230	238	409	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	9,652	366	973	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	4,027	220	582	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	7,038	111	201	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	31,721	874	2,042	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	1,157	26	68	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	1,851	73	194	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	9,686	305	619	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Machinery	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	7,974	243	267	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	10,293	390	920	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	4,815	715	726	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	444	53	142	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	5,937	104	214	0.000
Machinery Total		**29.33**	**0.93**	**1.85**	**116,232**	**3,965**	**7,857**	**0.152**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Transport Equi	Process Motors - VSD, Motor Optimization and Efficient Motors	2.73	0.17	0.23	0	0	0	0.026
	Process Motors - System Component Improvement and Replace	3.97	0.09	0.22	0	0	0	0.014
	Process Cooling - VSD, Motor Optimization and Efficient Motors	1.06	0.06	0.08	0	0	0	0.009
	Lighting - Equipment Upgrades and Replacement	4.63	0.36	0.65	(553)	(36)	(64)	0.055
	Lighting - Efficient System Design and Controls	4.10	0.14	0.34	(422)	(11)	(28)	0.020
	Process Cooling - Improved Operations and Maintenance	0.61	0.02	0.04	0	0	0	0.003
	Motors - Process Management and Continuous Improvement	2.86	0.02	0.03	0	0	0	0.003
	Motors - Improved Controls and Sensors	0.10	0.02	0.03	0	0	0	0.003
	HVAC - Improved Operations and Maintenance	1.70	0.07	0.18	0	0	0	0.010
	HVAC - Efficient System Design and Controls	6.80	0.06	0.11	0	0	0	0.009
	Motors - Improved Operations and Maintenance	0.70	0.02	0.05	0	0	0	0.003
	HVAC - Insulation and Sealing of System Components	1.91	0.05	0.12	0	0	0	0.007
	Other - System Component Improvement and Replacement	0.13	0.00	0.01	0	0	0	0.000
	Process Cooling - Equipment Upgrades and Replacement	0.26	0.00	0.01	0	0	0	0.001
	Process Cooling - Efficient System Design and Controls	0.15	0.00	0.01	0	0	0	0.001
	HVAC - Cooling - Efficient System Design and Controls	0.70	0.02	0.06	0	0	0	0.003
	HVAC - Cooling - Equipment Upgrades and Replacement	2.15	0.02	0.04	0	0	0	0.003
	Process Heating (E) - Process Controls	0.13	0.01	0.02	0	0	0	0.001
	Other - Improved Operations and Maintenance	0.02	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.21	0.00	0.01	0	0	0	0.001
	Process Heating (E) - Heat Containment Improvements	0.06	0.00	0.01	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.05	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.02	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.48	0.02	0.03	0	0	0	0.003
	Air Compression - Equipment Upgrades and Replacement	1.04	0.02	0.03	0	0	0	0.002
	Air Compression - Variable Speed Drives and Motor Upgrades	0.07	0.01	0.02	0	0	0	0.002
	Air Compression - Efficient System Design and Controls	0.33	0.01	0.02	0	0	0	0.001
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	13,808	215	397	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	2,676	57	152	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	5,020	228	393	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	9,263	352	934	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	3,865	211	559	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	6,864	108	196	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	30,915	852	1,992	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	1,128	25	66	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	1,808	71	189	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	9,456	297	604	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Transport Equi	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	13,489	412	451	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	17,413	661	1,556	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	8,146	1,210	1,227	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	752	90	240	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	10,044	176	363	0.000
Transport Equipment Total		**36.97**	**1.19**	**2.36**	**133,671**	**4,917**	**9,225**	**0.179**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Wood Product	Process Motors - VSD, Motor Optimization and Efficient Motors	3.35	0.21	0.28	0	0	0	0.033
	Process Motors - System Component Improvement and Replace	2.78	0.07	0.17	0	0	0	0.012
	Process Cooling - VSD, Motor Optimization and Efficient Motors	0.11	0.01	0.01	0	0	0	0.001
	Lighting - Equipment Upgrades and Replacement	1.68	0.13	0.23	(52)	(3)	(6)	0.020
	Lighting - Efficient System Design and Controls	1.08	0.05	0.12	(39)	(1)	(3)	0.007
	Process Cooling - Improved Operations and Maintenance	0.06	0.00	0.00	0	0	0	0.000
	Motors - Process Management and Continuous Improvement	3.51	0.02	0.04	0	0	0	0.004
	Motors - Improved Controls and Sensors	0.12	0.02	0.04	0	0	0	0.003
	HVAC - Improved Operations and Maintenance	0.47	0.02	0.05	0	0	0	0.003
	HVAC - Efficient System Design and Controls	1.89	0.02	0.03	0	0	0	0.003
	Motors - Improved Operations and Maintenance	0.87	0.02	0.06	0	0	0	0.003
	HVAC - Insulation and Sealing of System Components	0.53	0.01	0.03	0	0	0	0.002
	Other - System Component Improvement and Replacement	0.24	0.00	0.01	0	0	0	0.001
	Process Cooling - Equipment Upgrades and Replacement	0.04	0.00	0.00	0	0	0	0.000
	Process Cooling - Efficient System Design and Controls	0.01	0.00	0.00	0	0	0	0.000
	HVAC - Cooling - Efficient System Design and Controls	0.18	0.01	0.02	0	0	0	0.001
	HVAC - Cooling - Equipment Upgrades and Replacement	0.56	0.01	0.01	0	0	0	0.001
	Process Heating (E) - Process Controls	0.06	0.00	0.01	0	0	0	0.000
	Other - Improved Operations and Maintenance	0.04	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.09	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Heat Containment Improvements	0.02	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.04	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Variable Speed Drives and Motor Upgrades	0.00	0.00	0.00	0	0	0	0.000
	Air Compression - Efficient System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	2,540	39	73	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	492	11	28	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	923	42	72	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	1,704	65	172	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	711	39	103	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	12,424	195	355	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	22,161	617	1,442	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	2,042	45	120	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	3,274	129	343	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	6,447	215	437	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Wood Product	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	6,463	197	216	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	8,343	317	745	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	3,903	580	588	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	360	43	115	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	4,812	84	174	0.000
Wood Products Total		**17.77**	**0.61**	**1.14**	**76,508**	**2,614**	**4,973**	**0.095**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Beverage and	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	0	0	0	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	0	0	0	0.000
Beverage and Tobacco Total		**0.00**	**0.00**	**0.00**	**0**	**0**	**0**	**0.000**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
WWTF	Process Motors - VSD, Motor Optimization and Efficient Motors	0.56	0.04	0.05	0	0	0	0.006
	Process Motors - System Component Improvement and Replace	0.78	0.02	0.04	0	0	0	0.003
	Process Cooling - VSD, Motor Optimization and Efficient Motors	0.00	0.00	0.00	0	0	0	0.000
	Lighting - Equipment Upgrades and Replacement	0.28	0.02	0.04	(19)	(1)	(2)	0.003
	Lighting - Efficient System Design and Controls	0.24	0.01	0.02	(14)	(0)	(1)	0.001
	Process Cooling - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	Motors - Process Management and Continuous Improvement	0.59	0.00	0.01	0	0	0	0.001
	Motors - Improved Controls and Sensors	0.02	0.00	0.01	0	0	0	0.001
	HVAC - Improved Operations and Maintenance	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Efficient System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	Motors - Improved Operations and Maintenance	0.14	0.00	0.01	0	0	0	0.001
	HVAC - Insulation and Sealing of System Components	0.00	0.00	0.00	0	0	0	0.000
	Other - System Component Improvement and Replacement	0.06	0.00	0.00	0	0	0	0.000
	Process Cooling - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Process Cooling - Efficient System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Cooling - Efficient System Design and Controls	0.00	0.00	0.00	0	0	0	0.000
	HVAC - Cooling - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Controls	0.00	0.00	0.00	0	0	0	0.000
	Other - Improved Operations and Maintenance	0.01	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Process Management and Continuous Im	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Heat Containment Improvements	0.00	0.00	0.00	0	0	0	0.000
	Process Heating (E) - Equipment Upgrades and Replacement	0.00	0.00	0.00	0	0	0	0.000
	Other - VSD, Motor Optimization and Efficient Motors	0.01	0.00	0.00	0	0	0	0.000
	Air Compression - Improved Operations and Maintenance	1.54	0.06	0.09	0	0	0	0.009
	Air Compression - Equipment Upgrades and Replacement	3.36	0.05	0.08	0	0	0	0.008
	Air Compression - Variable Speed Drives and Motor Upgrades	0.22	0.04	0.05	0	0	0	0.006
	Air Compression - Efficient System Design and Controls	1.07	0.03	0.08	0	0	0	0.005
	HVAC - Heating - Equipment Upgrades and Replacement	0.00	0.00	0.00	1,713	27	49	0.000
	HVAC - Heating - Improved Operations and Maintenance	0.00	0.00	0.00	332	7	19	0.000
	HVAC - Heating - Improved System Design and Controls	0.00	0.00	0.00	623	28	49	0.000
	HVAC - Heating - Insulation and Sealing of System Components	0.00	0.00	0.00	1,149	44	116	0.000
	HVAC - Heating - Waste and/or Process Heat Recovery	0.00	0.00	0.00	480	26	69	0.000
	Process Heating (G) - Equipment Upgrades and Replacement	0.00	0.00	0.00	13,779	216	394	0.000
	Process Heating (G) - Improved Operations and Maintenance	0.00	0.00	0.00	24,577	684	1,599	0.000
	Process Heating (G) - Improved System Design and Controls	0.00	0.00	0.00	2,265	50	133	0.000
	Process Heating (G) - Insulation and Sealing of System Compor	0.00	0.00	0.00	3,623	143	380	0.000
	Process Heating (G) - Waste and/or Process Heat Recovery	0.00	0.00	0.00	7,150	239	484	0.000
	Steam Production - Equipment Upgrades and Replacement	0.00	0.00	0.00	10,550	322	353	0.000
	Steam Production - Improved Operations and Maintenance	0.00	0.00	0.00	13,619	517	1,217	0.000

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
WWTF	Steam Production - Improved System Design and Controls	0.00	0.00	0.00	6,371	946	960	0.000
	Steam Production - Insulation and Sealing of System Componer	0.00	0.00	0.00	588	71	187	0.000
	Steam Production - Waste and/or Process Heat Recovery	0.00	0.00	0.00	7,855	138	284	0.000
WWTF Total		**8.89**	**0.27**	**0.48**	**94,641**	**3,456**	**6,289**	**0.043**

Segment	End Use Category	Electrical Economic Potential (GWh)	Electrical Achievable Potential 2012 (GWh)	Electrical Achievable Potential 2018 (GWh)	Gas Economic Potential (therms)	Gas Achievable Potential 2012 (therms)	Gas Achievable Potential 2018 (therms)	2012 Demand Reduction (MW)
Other	Process Motors - VSD, Motor Optimization and Efficient Motors	1.83	0.12	0.15	0	0	0	0.018

APPENDIX E : TOP ENERGY-SAVINGS OPPORTUNITIES WITHIN THE COMMERCIAL MARKET

TABLE E-1: TOP ELECTRICITY-SAVING MEASURES BY COMMERCIAL MARKET SEGMENT - 2012 ACHIEVABLE POTENTIAL

Office	GWh	Mercantile	GWh	Lodging	GWh	Warehouse/Storage	GWh
Lighting controls / design	0.99	Lighting equipment	0.96	Lighting equipment	1.10	Refrig - RCx / controls	0.61
HVAC RCx / Controls	0.82	HVAC RCx / Controls	0.59	Lighting controls / design	0.21	Refrig - Cooler/Freezer equip	0.29
Lighting equipment	0.45	Cooling Equipment	0.22	HVAC RCx / Controls	0.20	Lighting controls / design	0.24
Cooling Equipment	0.19	Refrig - RCx / controls	0.17	Water Heating Improvements	0.16	HVAC RCx / Controls	0.19
Water Heating Improvements	0.18	Lighting controls / design	0.15	Cooling Equipment	0.12	Lighting equipment	0.12
Shell improvement	0.07	Water Heating Improvements	0.13	Refrig - RCx / controls	0.04	Refrig - Displays	0.10
TOTAL	**2.70**	**TOTAL**	**2.23**	**TOTAL**	**1.83**	**TOTAL**	**1.54**
Health Care	**GWh**	**Education**	**GWh**	**Food Sales**	**GWh**	**Food Service**	**GWh**
Lighting controls / design	0.40	Lighting controls / design	0.61	Refrig - RCx / controls	0.49	Refrig - RCx / controls	0.26
Lighting equipment	0.40	HVAC RCx / Controls	0.32	Refrig - Cooler/Freezer equip	0.19	Lighting equipment	0.19
HVAC RCx / Controls	0.33	Lighting equipment	0.10	Refrig - Displays	0.17	Water Heating Improvements	0.16
Cooling Equipment	0.10	Cooling Equipment	0.09	Water Heating Improvements	0.12	HVAC RCx / Controls	0.14
Water Heating Improvements	0.09	Water Heating Improvements	0.08	HVAC RCx / Controls	0.05	Refrig - Displays	0.13
Computers/Office Equip	0.05	Shell improvement	0.04	Lighting controls / design	0.03	Refrig - Cooler/Freezer equip	0.09
TOTAL	**1.38**	**TOTAL**	**1.24**	**TOTAL**	**1.06**	**TOTAL**	**0.97**

TABLE E-2: TOP NATURAL GAS-SAVING MEASURES BY COMMERCIAL MARKET SEGMENT - 2012 ACHIEVABLE POTENTIAL

Lodging	Therms	Office	Therms	Education	Therms	Mercantile	Therms
HVAC RCx / Controls	24,460	HVAC RCx / Controls	19,097	HVAC RCx / Controls	15,661	HVAC RCx / Controls	11,779
Water Heating Improvements	8,174	Cooling Equipment	6,472	Cooling Equipment	4,951	Cooling Equipment	5,482
Cooling Equipment	6,220	Water Heating Improvements	5,573	Water Heating Improvements	4,825	Water Heating Improvements	4,613
Faucets / Nozzles	2,472	Gas Heating Equip	2,056	Faucets / Nozzles	1,286	Shell improvement	1,844
Shell improvement	2,160	Faucets / Nozzles	1,502	Gas Heating Equip	1,252	Gas Heating Equip	1,779
Gas Heating Equip	1,269	Shell improvement	995	Shell improvement	813	Faucets / Nozzles	1,259
TOTAL	**44,755**	**TOTAL**	**35,696**	**TOTAL**	**28,788**	**TOTAL**	**26,756**
Health Care	**Therms**	**Warehouse/Storage**	**Therms**	**Service/Light Mnftg.**	**Therms**	**Public Assembly**	**Therms**
HVAC RCx / Controls	9,734	HVAC RCx / Controls	8,181	HVAC RCx / Controls	5,876	HVAC RCx / Controls	5,401
Water Heating Improvements	5,910	Cooling Equipment	3,696	Water Heating Improvements	3,801	Cooling Equipment	3,006
Cooling Equipment	2,951	Water Heating Improvements	2,079	Cooling Equipment	2,653	Water Heating Improvements	2,852
Faucets / Nozzles	1,592	Gas Heating Equip	1,146	Faucets / Nozzles	1,030	Faucets / Nozzles	773
Shell improvement	992	Shell improvement	566	Shell improvement	921	Gas Heating Equip	717
Clothes Washing	815	Faucets / Nozzles	546	Gas Heating Equip	836	Shell improvement	493
TOTAL	**21,994**	**TOTAL**	**16,214**	**TOTAL**	**15,116**	**TOTAL**	**13,241**

APPENDIX F : ALLOCATION OF POTENTIAL AND PROGRAM COSTS TO IAMU MEMBERS

The Energy Center conducted a high-level allocation of 2012 achievable energy efficiency potential and program costs by sector to individual IAMU member service territories using utility-specific data on base energy sales by sector (residential, commercial, and industrial). For each sector, energy efficiency potential was allocated to individual utilities by multiplying aggregate savings potential across all participating utilities by each utility's individual share of total sector sales. The same approach was used to allocate program costs by sector for each participating utility (expressed as a percentage of estimated total program costs). This allocation process was conducted for the 2012 achievable potential and program cost estimates only.

Table F-1 presents the allocation of energy efficiency and demand reduction potential to IAMU member utilities. Table F-2 presents allocated electricity and natural gas efficiency potential as a percentage of each utility's base sales. Table F-3 presents allocated program costs by sector.

TABLE F-1. ALLOCATION OF ACHIEVABLE 2012 ENERGY EFFICIENCY POTENTIAL TO IAMU MEMBERS

	MWh			kW			Therms		
IAMU Member	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Afton	64	33	-	15	11	-	-	-	-
Akron	138	14	37	31	5	5	-	-	-
Algona[9]	578	805	-	131	276	-	-	-	-
Allerton	-	-	-	-	-	-	1,783	281	12,217
Alta	174	68	-	40	23	-	-	-	-
Alta Vista	22	7	-	5	3	-	-	-	-
Alton	-	-	-	-	-	-	-	1,777	1,468
Amana	135	103	535	31	35	78	-	-	-
Ames	2,893	2,967	1,318	658	1,017	191	-	-	-
Anita	96	48	-	22	17	-	-	-	-
Anthon	71	7	7	16	2	1	-	-	-
Aplington	77	28	-	18	10	-	-	-	-
Atlantic	707	596	79	161	204	11	-	-	-
Auburn	34	-	-	8	-	-	-	-	-

[9] For Algona, commercial estimates represent combined savings potential from the commercial and industrial sectors.

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Aurelia	93	11	14	21	4	2	-	-	-
Bancroft	62	21	47	14	7	7	-	-	-
Bedford	-	-	-	-	-	-	5,129	1,807	-
Bellevue	183	53	22	42	18	3	-	-	-
Bloomfield	237	71	65	54	24	9	8,617	5,925	1,330
Breda	47	14	4	11	5	1	-	-	-
Brighton	-	-	-	-	-	-	2,329	379	-
Brooklyn	126	61	-	29	21	-	4,266	2,625	400
Buffalo	53	16	-	12	6	-	-	-	-
Burt	36	19	-	8	6	-	-	-	-
Callender	29	7	-	7	2	-	-	-	-
Carlisle	215	86	-	49	30	-	-	-	-
Cascade	142	69	36	32	24	5	6,869	3,410	-
Cedar Falls	2,867	2,419	431	652	830	62	102,561	48,940	17,148
Clearfield	-	-	-	-	-	-	950	1,089	-
Coggon	43	5	4	10	2	1	-	-	-
Consumers Energy	-	-	-	-	-	-	4,255	29,782	24,601
Coon Rapids	138	84	17	31	29	3	4,677	2,163	2,942
Corning	152	122	-	35	42	-	5,898	5,116	-
Corwith	20	13	-	5	4	-	-	-	-
Danville	65	22	-	15	8	-	-	-	-
Dayton	56	24	1	13	8	0	-	-	-
Denver	157	42	5	36	14	1	-	-	-
Dike	60	29	-	14	10	-	-	-	-
Durant	115	21	31	26	7	4	-	-	-

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Dysart	98	39	-	22	13	-	-	-	-
Earlville	55	24	-	13	8	-	-	-	-
Eldridge	309	78	78	70	27	11	-	-	-
Ellsworth	36	27	5	8	9	1	-	-	-
Emmetsberg	-	-	-	-	-	-	15,283	11,249	713
Estherville	397	104	201	90	36	29	-	-	-
Everly	-	-	-	-	-	-	2,650	382	1,315
Fairbank	85	32	-	19	11	-	3,272	840	-
Farmer's Coop	264	-	49	60	-	7	-	-	-
Farnhamville	32	33	-	7	11	-	-	-	-
Fonda	55	17	5	13	6	1	-	-	-
Fontanelle	87	19	-	20	6	-	-	-	-
Forest City	264	180	273	60	62	40	-	-	-
Fredricksburg	97	101	-	22	35	-	-	-	-
Gilmore	-	-	-	-	-	-	2,323	695	5,987
Glidden	102	13	9	23	4	1	-	-	-
Gowrie	63	42	-	14	14	-	-	-	-
Graettinger	96	17	19	22	6	3	3,160	1,057	1,066
Grafton	23	6	-	5	2	-	-	-	-
Grand Junction	60	10	6	14	3	1	-	-	-
Greenfield	173	109	179	39	37	26	-	-	-
Grundy Center	222	133	30	50	46	4	-	-	-
Guthrie Center	-	-	-	-	-	-	7,024	6,048	1,807
Guttenberg	147	51	24	33	18	3	-	-	-
Harlan	460	178	141	105	61	21	18,442	8,577	8,528

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Hartley	-	-	-	-	-	-	6,204	1,603	1,324
Hawarden	-	-	-	-	-	-	7,759	3,158	2,610
Hinton	78	13	16	18	4	2	-	-	-
Hopkinton	47	22	2	11	7	0	-	-	-
Hudson	128	67	-	29	23	-	-	-	-
Independence	394	195	163	90	67	24	-	-	-
Indianola	870	660	48	198	226	7	-	-	-
Keosauqua	82	63	25	19	22	4	-	-	-
La Porte City	170	72	-	39	25	-	-	-	-
Lake Mills	167	46	157	38	16	23	-	-	-
Lake Park	-	-	-	-	-	-	4,693	2,773	2,291
Lake View	148	74	30	34	25	4	-	-	-
Lamoni	160	154	-	36	53	-	6,875	2,850	80
Larchwood	75	26	-	17	9	-	-	-	-
Laurens	221	26	98	50	9	14	-	-	-
Lawler	32	10	-	7	3	-	-	-	-
Lehigh	32	4	-	7	2	-	-	-	-
Lenox	139	105	-	32	36	-	4,168	14,113	-
Lineville	-	-	-	-	-	-	939	309	-
Livermore	33	10	-	7	3	-	-	-	-
Long Grove	43	9	-	10	3	-	-	-	-
Lorimor	-	-	-	-	-	-	1,450	156	-
Manilla	-	-	-	-	-	-	2,747	653	304
Manning	138	45	160	31	16	23	6,303	1,748	2,452
Mapleton	127	30	29	29	10	4	-	1,460	1,207

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Maquoketa	442	343	131	101	117	19	-	-	-
Marathon	22	11	-	5	4	-	-	-	-
McGregor	62	25	12	14	9	2	-	-	-
Milford	262	65	85	60	22	12	-	-	-
Montezuma	143	101	100	32	35	14	6,169	3,253	4,340
Morning Sun	-	-	-	-	-	-	2,733	794	82
Moulton	-	-	-	-	-	-	2,016	483	-
Mt. Pleasant	493	503	-	112	172	-	-	-	-
Muscatine	1,844	2,060	4,017	420	706	583	-	-	-
Neola	69	12	-	16	4	-	-	-	-
New Hampton	263	138	184	60	47	27	-	-	-
New London	177	52	-	40	18	-	-	-	-
Ogden	155	15	26	35	5	4	-	-	-
Onawa	302	171	-	69	59	-	-	-	-
Orange City	-	-	-	-	-	-	25,442	12,041	9,947
Orient	45	-	-	10	-	-	-	-	-
Osage	275	446	-	63	153	-	17,471	8,907	7,332
Panora	80	81	-	18	28	-	-	-	-
Paton	21	7	-	5	2	-	-	-	-
Pella	684	281	915	156	96	133	-	-	-
Pocahontas	163	80	31	37	27	5	-	-	-
Prescott	-	-	-	-	-	-	834	249	-
Preston	80	47	-	18	16	-	3,739	797	438
Readlyn	57	17	-	13	6	-	-	-	-
Remsen	-	-	-	-	-	-	5,933	852	2,173

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Renwick	29	22	-	7	7	-	-	-	-
Rock Rapids	-	-	-	-	-	-	18,298	347	286
Rockford	60	32	2	14	11	0	-	-	-
Rolfe	-	-	-	-	-	-	3,186	990	477
Sabula	49	13	-	11	5	-	3,020	495	-
Sac City	-	-	-	-	-	-	9,511	4,139	1,211
Sanborn	-	-	-	-	-	-	4,530	1,610	10,706
Sergeant Bluff	291	192	-	66	66	-	-	-	-
Sibley	288	149	41	66	51	6	-	-	-
Sioux Center	-	-	-	-	-	-	14,542	22,772	60,970
Spencer	1,172	1,041	37	267	357	5	-	-	-
Stanhope	30	12	-	7	4	-	-	-	-
Stanton	78	33	1	18	11	0	-	-	-
State Center	159	26	9	36	9	1	-	-	-
Story City	291	67	226	66	23	33	-	-	-
Stratford	43	26	-	10	9	-	-	-	-
Strawberry Point	81	33	-	18	11	-	-	-	-
Stuart	119	81	-	27	28	-	-	-	-
Sumner	158	75	-	36	26	-	-	-	-
Titonka	-	-	-	-	-	-	795	121	
Tipton	225	141	35	51	48	5	13,607	6,473	-
Traer	172	65	39	39	22	6	-	-	-
Villisca	132	48	-	30	16	-	-	-	-
Vinton	340	108	64	77	37	9	-	-	-
Wall Lake	142	13	-	32	5	-	2,351	344	3,479

IAMU Member	MWh			kW			Therms		
	Res	Com	Ind	Res	Com	Ind	Res	Com	Ind
Waukee	-	-	-	-	-	-	36,567	4,013	-
Waverly	662	616	314	151	211	46	-	-	-
Wayland	-	-	-	-	-	-	2,903	1,115	905
Webster City	601	369	647	137	126	94	-	-	-
Wellman	-	-	-	-	-	-	4,783	2,086	19
West Bend	116	40	25	26	14	4	3,327	1,471	2,651
West Liberty	222	129	225	50	44	33	-	-	-
West Point	118	70	3	27	24	0	-	-	-
Westfield	12	2	-	3	1	-	-	-	-
Whittemore	45	15	5	10	5	1	3,560	1,839	1,519
Wilton	215	59	54	49	20	8	-	-	-
Winfield	-	-	-	-	-	-	3,475	704	582
Winterset	380	207	53	87	71	8	-	-	-
Woodbine	-	-	-	-	-	-	3,827	2,287	594
Woolstock	23	10	-	5	4	-	-	-	-

TABLE F-2. ALLOCATION OF ACHIEVABLE 2012 ENERGY EFFICIENCY POTENTIAL TO IAMU MEMBERS, EXPRESSED AS A PERCENTAGE OF BASE ELECTRICITY AND NATURAL GAS SALES

IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales	IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales
Afton	1.40%	-	Larchwood	1.46%	-
Akron	1.22%	-	Laurens	1.10%	-
Algona	1.24%	-	Lawler	1.48%	-
Allerton	-	0.83%	Lehigh	1.58%	-
Alta	1.44%	-	Lenox	1.33%	1.02%

IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales	IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales
Alta Vista	1.46%	-	Lineville	-	1.19%
Alton	-	0.52%	Livermore	1.48%	-
Amana	0.74%	-	Long Grove	1.53%	-
Ames	1.07%	-	Lorimor	-	1.25%
Anita	1.40%	-	Manilla	-	1.16%
Anthon	1.41%	-	Manning	0.90%	1.08%
Aplington	1.45%	-	Mapleton	1.24%	0.52%
Atlantic	1.24%	-	Maquoketa	1.14%	-
Auburn	1.70%	-	Marathon	1.40%	-
Aurelia	1.35%	-	McGregor	1.23%	-
Bancroft	0.98%	-	Milford	1.16%	-
Bedford	-	1.19%	Montezuma	1.00%	0.97%
Bellevue	1.33%	-	Morning Sun	-	1.21%
Bloomfield	1.19%	1.10%	Moulton	-	1.20%
Breda	1.36%	-	Mt. Pleasant	1.28%	-
Brighton	-	1.24%	Muscatine	0.83%	-
Brooklyn	1.41%	1.08%	Neola	1.56%	-
Buffalo	1.48%	-	New Hampton	1.00%	-
Burt	1.39%	-	New London	1.48%	-
Callender	1.52%	-	Ogden	1.33%	-
Carlisle	1.44%	-	Onawa	1.38%	-
Cascade	1.19%	1.15%	Orange City	-	1.06%
Cedar Falls	1.21%	1.10%	Orient	1.70%	-
Clearfield	-	1.09%	Osage	1.22%	1.06%
Coggon	1.42%	-	Panora	1.29%	-

IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales	IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales
Consumers Energy	-	0.90%	Paton	1.47%	-
Coon Rapids	1.26%	1.03%	Pella	0.87%	-
Corning	1.32%	1.12%	Pocahontas	1.23%	-
Corwith	1.36%	-	Prescott	-	1.20%
Danville	1.46%	-	Preston	1.38%	1.09%
Dayton	1.40%	-	Readlyn	1.49%	-
Denver	1.44%	-	Remsen	-	1.10%
Dike	1.41%	-	Renwick	1.33%	-
Durant	1.21%	-	Rock Rapids	-	1.28%
Dysart	1.44%	-	Rockford	1.36%	-
Earlville	1.42%	-	Rolfe	-	1.14%
Eldridge	1.21%	-	Sabula	1.49%	1.16%
Ellsworth	1.22%	-	Sac City	-	1.09%
Emmetsberg	-	1.12%	Sanborn	-	0.91%
Estherville	1.07%	-	Sergeant Bluff	1.35%	-
Everly	-	1.05%	Sibley	1.26%	-
Fairbank	1.45%	1.21%	Sioux Center	-	0.86%
Farmer's Coop	1.34%	-	Spencer	1.28%	-
Farnhamville	1.28%	-	Stanhope	1.43%	-
Fonda	1.36%	-	Stanton	1.41%	-
Fontanelle	1.53%	-	State Center	1.46%	-
Forest City	0.93%	-	Story City	0.97%	-
Fredricksburg	1.28%	-	Stratford	1.37%	-
Gilmore	-	0.90%	Strawberry Point	1.44%	-
Glidden	1.43%	-	Stuart	1.35%	-

IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales	IAMU Member	2012 Achievable Electric Potential as % of Sales	2012 Achievable Gas Potential as % of Sales
Gowrie	1.36%	-	Sumner	1.41%	-
Graettinger	1.27%	1.09%	Tipton	1.24%	1.15%
Grafton	1.50%	-	Titonka	-	0.47%
Grand Junction	1.39%	-	Traer	1.22%	-
Greenfield	0.93%	-	Villisca	1.45%	-
Grundy Center	1.25%	-	Vinton	1.26%	-
Guthrie Center	-	1.06%	Wall Lake	1.61%	0.95%
Guttenberg	1.27%	-	Waukee	-	1.25%
Harlan	1.16%	1.05%	Waverly	1.07%	-
Hartley	-	1.13%	Wayland	-	1.10%
Hawarden	-	1.08%	Webster City	0.92%	-
Hinton	1.27%	-	Wellman	-	1.22%
Hopkinton	1.37%	-	West Bend	1.23%	0.99%
Hudson	1.39%	-	West Liberty	0.93%	-
Independence	1.10%	-	West Point	1.35%	-
Indianola	1.29%	-	Westfield	1.58%	-
Keosauqua	1.14%	-	Whittemore	1.32%	1.06%
La Porte City	1.43%	-	Wilton	1.21%	-
Lake Mills	0.93%	-	Winfield	-	1.15%
Lake Park	-	1.04%	Winterset	1.26%	-
Lake View	1.22%	-	Woodbine	-	1.10%
Lamoni	1.29%	1.17%	Woolstock	1.41%	-

TABLE F-3. ALLOCATION OF 2012 ENERGY EFFICIENCY PROGRAM COSTS BY SECTOR FOR EACH IAMU MEMBER

	2012 Program Cost Estimate: Low			2012 Program Cost Estimate: High		
IAMU Member	**Residential ($)**	**Commercial ($)**	**Industrial ($)**	**Residential ($)**	**Commercial ($)**	**Industrial ($)**
Afton	53%	47%	0%	51%	49%	0%
Akron	67%	12%	22%	65%	12%	22%
Algona[10]	29%	71%	0%	27%	73%	0%
Allerton	47%	1%	53%	48%	1%	52%
Alta	60%	40%	0%	57%	43%	0%
Alta Vista	63%	37%	0%	61%	39%	0%
Alton	0%	36%	64%	0%	36%	64%
Amana	14%	19%	67%	13%	19%	67%
Ames	30%	53%	17%	28%	55%	16%
Anita	53%	47%	0%	51%	49%	0%
Anthon	77%	13%	10%	76%	14%	10%
Aplington	62%	38%	0%	59%	41%	0%
Atlantic	39%	56%	5%	36%	58%	5%
Auburn	100%	0%	0%	100%	0%	0%
Aurelia	72%	15%	13%	70%	17%	13%
Bancroft	40%	24%	36%	38%	25%	37%
Bedford	97%	3%	0%	97%	3%	0%
Bellevue	61%	30%	9%	59%	32%	9%
Bloomfield	76%	15%	9%	76%	15%	9%
Breda	62%	32%	7%	60%	34%	7%
Brighton	99%	1%	0%	99%	1%	0%
Brooklyn	76%	23%	1%	76%	24%	1%
Buffalo	65%	35%	0%	63%	37%	0%
Burt	52%	48%	0%	50%	50%	0%
Callender	71%	29%	0%	69%	31%	0%
Carlisle	59%	41%	0%	57%	43%	0%
Cascade	76%	18%	6%	76%	19%	6%
Cedar Falls	64%	31%	5%	64%	32%	5%
Clearfield	92%	8%	0%	92%	8%	0%
Coggon	76%	15%	9%	75%	16%	9%
Consumers Energy	40%	21%	38%	41%	21%	38%
Coon Rapids	67%	25%	8%	67%	25%	8%
Corning	69%	31%	0%	68%	32%	0%
Corwith	47%	53%	0%	45%	55%	0%
Danville	63%	37%	0%	61%	39%	0%
Dayton	56%	43%	1%	54%	45%	1%

[10] For Algona, commercial estimates represent combined program costs for the commercial and industrial sectors.

	2012 Program Cost Estimate: Low			2012 Program Cost Estimate: High		
IAMU Member	**Residential ($)**	**Commercial ($)**	**Industrial ($)**	**Residential ($)**	**Commercial ($)**	**Industrial ($)**
Denver	67%	31%	3%	65%	33%	3%
Dike	55%	45%	0%	52%	48%	0%
Durant	61%	19%	20%	59%	20%	20%
Dysart	60%	40%	0%	57%	43%	0%
Earlville	57%	43%	0%	55%	45%	0%
Eldridge	57%	25%	18%	55%	27%	18%
Ellsworth	41%	52%	7%	38%	54%	7%
Emmetsberg	94%	5%	1%	94%	5%	1%
Estherville	48%	22%	30%	47%	23%	30%
Everly	91%	1%	8%	92%	1%	7%
Fairbank	83%	17%	0%	83%	17%	0%
Farmer's Coop	81%	0%	19%	81%	0%	19%
Farnhamville	36%	64%	0%	34%	66%	0%
Fonda	61%	33%	6%	59%	35%	6%
Fontanelle	73%	27%	0%	71%	29%	0%
Forest City	29%	34%	37%	28%	36%	36%
Fredricksburg	36%	64%	0%	34%	66%	0%
Gilmore	69%	2%	29%	70%	2%	28%
Glidden	75%	17%	8%	74%	18%	8%
Gowrie	47%	53%	0%	45%	55%	0%
Graettinger	81%	9%	10%	81%	10%	9%
Grafton	68%	32%	0%	66%	34%	0%
Grand Junction	71%	21%	9%	69%	22%	9%
Greenfield	30%	32%	38%	29%	34%	38%
Grundy Center	45%	47%	7%	43%	49%	7%
Guthrie Center	90%	6%	4%	91%	6%	4%
Guttenberg	56%	33%	11%	54%	35%	11%
Harlan	72%	16%	12%	72%	16%	12%
Hartley	95%	2%	3%	95%	2%	3%
Hawarden	92%	3%	5%	92%	3%	5%
Hinton	65%	18%	17%	64%	20%	17%
Hopkinton	54%	44%	2%	52%	46%	2%
Hudson	53%	47%	0%	50%	50%	0%
Independence	42%	36%	21%	41%	38%	21%
Indianola	42%	55%	3%	40%	57%	3%
Keosauqua	37%	49%	14%	35%	52%	14%
La Porte City	58%	42%	0%	55%	45%	0%
Lake Mills	38%	18%	44%	37%	19%	44%
Lake Park	89%	4%	7%	89%	4%	7%
Lake View	47%	41%	12%	45%	43%	12%
Lamoni	68%	32%	0%	67%	33%	0%
Larchwood	62%	38%	0%	60%	40%	0%
Laurens	57%	12%	31%	56%	12%	32%

	2012 Program Cost Estimate: Low			2012 Program Cost Estimate: High		
IAMU Member	**Residential ($)**	**Commercial ($)**	**Industrial ($)**	**Residential ($)**	**Commercial ($)**	**Industrial ($)**
Lawler	65%	35%	0%	63%	37%	0%
Lehigh	80%	20%	0%	79%	21%	0%
Lenox	62%	38%	0%	61%	39%	0%
Lineville	98%	2%	0%	98%	2%	0%
Livermore	65%	35%	0%	63%	37%	0%
Long Grove	74%	26%	0%	72%	28%	0%
Lorimor	99%	1%	0%	99%	1%	0%
Manilla	97%	2%	2%	97%	2%	2%
Manning	63%	10%	26%	63%	11%	26%
Mapleton	55%	25%	20%	53%	26%	21%
Maquoketa	37%	50%	13%	35%	52%	13%
Marathon	53%	47%	0%	51%	49%	0%
McGregor	51%	36%	12%	49%	38%	13%
Milford	55%	23%	22%	53%	25%	22%
Montezuma	60%	22%	19%	59%	22%	18%
Morning Sun	97%	2%	0%	98%	2%	0%
Moulton	98%	2%	0%	98%	2%	0%
Mt. Pleasant	36%	64%	0%	34%	66%	0%
Muscatine	18%	35%	47%	17%	36%	47%
Neola	78%	22%	0%	76%	24%	0%
New Hampton	36%	33%	31%	35%	35%	31%
New London	66%	34%	0%	64%	36%	0%
Ogden	73%	12%	15%	72%	13%	15%
Onawa	51%	49%	0%	48%	52%	0%
Orange City	91%	3%	6%	91%	3%	6%
Orient	100%	0%	0%	100%	0%	0%
Osage	60%	36%	3%	60%	37%	3%
Panora	36%	64%	0%	34%	66%	0%
Paton	64%	36%	0%	62%	38%	0%
Pella	30%	21%	49%	29%	22%	49%
Pocahontas	48%	41%	11%	46%	43%	11%
Prescott	98%	2%	0%	98%	2%	0%
Preston	78%	21%	1%	77%	22%	1%
Readlyn	67%	33%	0%	64%	36%	0%
Remsen	93%	1%	6%	94%	1%	5%
Renwick	44%	56%	0%	42%	58%	0%
Rock Rapids	100%	0%	0%	100%	0%	0%
Rockford	51%	47%	2%	49%	50%	2%
Rolfe	95%	2%	2%	96%	2%	2%
Sabula	90%	10%	0%	90%	10%	0%
Sac City	95%	3%	2%	95%	3%	2%
Sanborn	71%	2%	27%	72%	2%	27%
Sergeant Bluff	47%	53%	0%	44%	56%	0%

	2012 Program Cost Estimate: Low			2012 Program Cost Estimate: High		
IAMU Member	**Residential ($)**	**Commercial ($)**	**Industrial ($)**	**Residential ($)**	**Commercial ($)**	**Industrial ($)**
Sibley	48%	43%	8%	46%	45%	8%
Sioux Center	55%	7%	38%	56%	6%	37%
Spencer	39%	60%	2%	37%	62%	1%
Stanhope	59%	41%	0%	56%	44%	0%
Stanton	57%	42%	1%	55%	45%	1%
State Center	74%	21%	5%	72%	23%	5%
Story City	43%	17%	40%	41%	18%	41%
Stratford	49%	51%	0%	47%	53%	0%
Strawberry Point	59%	41%	0%	56%	44%	0%
Stuart	46%	54%	0%	43%	57%	0%
Sumner	55%	45%	0%	53%	47%	0%
Tipton	77%	20%	3%	77%	20%	3%
Titonka	85%	15%	0%	85%	15%	0%
Traer	52%	34%	14%	50%	36%	14%
Villisca	62%	38%	0%	59%	41%	0%
Vinton	56%	31%	13%	54%	33%	13%
Wall Lake	83%	7%	10%	82%	7%	10%
Waukee	99%	1%	0%	99%	1%	0%
Waverly	31%	50%	18%	30%	52%	18%
Wayland	93%	3%	5%	93%	3%	5%
Webster City	30%	31%	39%	28%	33%	39%
Wellman	97%	3%	0%	97%	3%	0%
West Bend	71%	17%	13%	70%	17%	12%
West Liberty	31%	31%	38%	29%	32%	38%
West Point	49%	50%	1%	47%	52%	1%
Westfield	80%	20%	0%	78%	22%	0%
Whittemore	82%	11%	7%	82%	11%	7%
Wilton	56%	27%	17%	54%	28%	17%
Winfield	96%	1%	3%	96%	1%	3%
Winterset	47%	45%	8%	45%	47%	8%
Woodbine	93%	4%	2%	94%	4%	2%
Woolstock	55%	45%	0%	53%	47%	0%

APPENDIX G : SURVEY INSTRUMENTS

The Energy Center developed two surveys for obtaining IAMU member input on what they expect energy efficiency programs can achieve in their communities:

- **Benchmarking Questionnaire**: This survey was sent to all IAMU members participating in the study, and solicited member input on reasonable levels of program expenditures and energy savings for their service territory. The survey also asked members to identify barriers to promoting greater levels of energy efficiency in their community.

- **Technology Questionnaire**: A targeted survey was sent to 16 municipal utilities with existing energy efficiency programs to obtain their input on expected market penetrations for key technologies in 2012, based on a comparison with results from a recent survey of Wisconsin energy efficiency experts.

Copies of the survey instruments are provided in this Appendix.

Iowa Association of Municipal Utilities
Energy Efficiency Potential Study
Benchmarking Questionnaire

Dear [IAMU member]:

Under contract to the Iowa Association of Municipal Utilities (IAMU), the Energy Center of Wisconsin (the Energy Center) is conducting a study to estimate energy efficiency potential in IAMU member service territories. As part of this effort, we would like you to complete a brief questionnaire to enable us to better understand energy efficiency potential in your service territory.

The following table presents 2006 data on IAMU member energy efficiency program spending and savings results (please note that data from IAMU members not participating in the energy efficiency potential study are not included). For each category, the maximum, minimum, median, and average value across IAMU membership is provided.

Table 1: Results from IAMU member energy efficiency programs[11]

	Energy Efficiency Spending as a % of Revenues	Electric Savings as a % of Sales	Gas Savings as a % of Sales
Maximum	9.9%	1.1%	0.7%
Minimum	0.1%	0.002%	0.006%
Median	0.5%	0.1%	0.2%
Average	0.9%	0.2%	0.2%

After reviewing the benchmark data in Table 1, please answer the following questions:

1) For your service territory, what do you view as a reasonable amount to spend on energy efficiency programs? Please express your answer in terms of a percentage of total retail sales revenue.

   _____ %

2) For your service territory, what do you view as a reasonable annual energy efficiency savings target? Please express your answer in terms of a percentage of total retail sales revenue.

   _____ %

[11] Please note that IAMU members may use different approaches for categorizing energy efficiency savings and expenditures.

3) What are the greatest barriers to promoting greater energy efficiency in your service territory?

4) What additional support could IAMU provide to help you achieve your energy efficiency objectives?

5) Are there any additional comments you would like to provide in connection with the potential study or energy efficiency opportunities and challenges in your service territory?

This questionnaire is an important part of the IAMU energy efficiency potential study, and we greatly appreciate your thoughtful participation.

Iowa Association of Municipal Utilities
Energy Efficiency Potential Study
Technology Questionnaire

The Energy Center of Wisconsin is assisting the Iowa Association of Municipal Utilities (IAMU) by developing estimates of the potential for increasing rates of adoption of energy efficiency in IAMU member service territories.

The Energy Center is conducting a similar analysis in Wisconsin. As part of our Wisconsin work we recently conducted a survey of 65 Wisconsin energy efficiency experts, asking them to estimate future market penetration of energy-efficient technologies. The experts provided estimates for two scenarios: moderate energy efficiency programs and aggressive energy efficiency programs. In some ways, the Wisconsin data will likely represent a reasonable proxy for Iowa. In other situations, however, the two states might be distinctly different. The purpose of this technology questionnaire is to solicit IAMU member input as to whether the Wisconsin estimates for individual technology measures can serve as a reasonable guide as to conditions in IAMU member service territories, and if they cannot, to determine more appropriate estimates

This questionnaire is a critical part of the IAMU energy efficiency potential study, and we greatly appreciate your thoughtful participation.

Example questions

Results from the Wisconsin survey are presented along with blank cells for IAMU member input. There are two distinct categories of measures, those that represent replacements of equipment when it fails (replace on burnout) and those that involve early replacement of installed measures (retrofit). As a different approach is required for the two categories of measures, an illustrative example is provided for each. (Note that the treatment of measures used in new construction parallels the approach used for replace on burnout measures.)

Replace on burnout and new construction measures

For replace on burnout and new construction measures, the relevant metric is annual market share—namely, the percentage of new equipment sold in a given year that is energy-efficient. The reader should note that the key variable in question is the percentage point increase in market share due to energy efficiency programs, not the percentage increase. We explain this distinction further in the following example.

The table below presents results for furnaces with electrically-efficient motors (ECM furnaces). Experts surveyed by the Energy Center predict that in 2012 baseline market share (without programs) for ECM furnaces will be 33%. That means that 33% of all furnaces sold in 2012 will be ECM furnaces. The experts also predict that moderate programs would increase that annual market share to 45%, which is a 12 percentage point increase over the baseline.[12] The experts predict that aggressive programs would increase that annual market share to 48%, which is a

[12] If we were expressing changes in percentages instead of percentage points, the increase in market share here would be 36% (45 / 33 – 1 = 0.36). Viewing the changes as percentages is confusing and not readily estimated from the data. The percentage point approach is straightforward as it requires only simple subtraction to calculate (45 – 33 = 12 percentage points).

15 percentage point increase over the baseline. (Note that for both levels of program effort, the comparison is always to the baseline.) IAMU members have the opportunity to confirm or revise these estimates for their service territory by inputting values in the blank cells.

2012	Results from ECW Survey of Experts			IAMU Input		
	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)
ECM Furnace	33%	12	15			

Retrofit measures

The construct for analyzing retrofit measures is by necessity different from the approach used for replace on burnout and new construction measures. Instead of being concerned with the percentage point increase in market share that could be achieved through program influence, the relevant metric is the annual percentage of eligible facilities that a program could influence to undertake the retrofit.

The base number used to estimate potential retrofits is almost always much larger than the base number of a particular measure that is replaced on burnout. For example, consider the number of refrigerators that might be replaced each year. If a typical refrigerator has a useful life of 20 years, assuming replacement on burnout, only 1/20 of all Iowa refrigerators are up for replacement each year. Consider in contrast a retrofit program that brought ceiling insulation up to an R-60 rating. All homes in Iowa that do not have that level of insulation (which would be most of them) would form the base of possible retrofit candidates. As such, the potential for retrofits is not measured by percentage point increases in market share, as was the case for replace on burnout measures, but rather by the percentage of homes that decided to do the retrofit in a given year.

The table below presents results for upgrading T12 commercial lighting to T8 lighting. Experts surveyed by the Energy Center predict that in 2012, a moderate program could induce 3% of eligible facilities to undertake the retrofit, and an aggressive program could induce 6% of eligible facilities to undertake the retrofit**.** IAMU members have the opportunity to confirm or revise these estimates for their service territory by inputting values in the blank cells.

2012	Results from ECW Survey of Experts		IAMU Input	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)
T8 retrofit	3%	6%		

Survey questions

By completing the tables below, indicate the impact that could be achieved by 2012 through moderate or aggressive energy efficiency programs in IAMU member service territories. Projected program impacts are measured in terms of what programs could achieve over and above naturally-occurring energy efficiency improvement (i.e., a "no program" scenario).

Residential Energy Efficiency

Residential replace on burnout and new construction measures

In completing the table below, please recall that that the relevant metric for this type of measure is the percentage point increase in baseline market share that is attributable to energy efficiency program efforts.

2012	**Results from ECW Survey of Experts**			**IAMU Input**		
	Baseline Market Share (% of equipment market)	**Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)**	**Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)**	**Baseline Market Share (% of equipment market)**	**Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)**	**Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)**
CFL bulbs - general purpose	25%	10	20			
LED bulbs - general purpose	3%	3	10			
ECM Furnace	33%	12	15			
Central AC SEER 14	20%	3	15			
Central AC SEER 15	19%	4	15			
Ductless mini-split	5%	-	10			
Dual fuel heat pump	5%	5	10			
Cold climate heat pump	1%	3	10			
Ground source heat pump	6%	5	10			
ENERGY STAR new home - gas heat	12%	8	15			
ENERGY STAR refrigerator	39%	4	20			
ENERGY STAR clothes washer	40%	5	10			
Tankless water heater - gas	5%	3	5			
Condensing water heater - gas	1%	4	10			

2012	Results from ECW Survey of Experts			IAMU Input		
	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)
High efficiency electric water heater (EF=0.93)	5%	5	10			
Heat pump water heater - electric	1%	3	5			
Convert elec water heater to gas	25%	-	1			

Residential retrofit measures

In completing the table below, please recall that the relevant metric is the annual percentage of eligible facilities that a program could influence to undertake the retrofit.

2012	Results from ECW Survey of Experts		IAMU Input	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)
Correcting shell deficiency (insulation/air leakage)	1%	5%		
Secondary fridge removal	1%	1%		
Standalone freezer removal	1%	4%		
Multifamily common area lighting retrofit	1%	4%		

Commercial Energy Efficiency

Commercial replace on burnout and new construction measures

In completing the table below, please recall that the relevant metric is the percentage point increase in baseline market share that is attributable to energy efficiency program efforts.

2012	Results from ECW Survey of Experts			IAMU Input		
	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)	Baseline Market Share (% of equipment market)	Annual Impact of Moderate Programs (percentage point increase over naturally-occurring efficiency)	Annual Impact of Aggressive Programs (percentage point increase over naturally-occurring efficiency)
Variable speed HVAC motor in new construction	18%	13	28			
High performance T8 in new construction	20%	30	50			
LED lighting in new construction	4%	2	8			
Daylighting control in new construction	10%	10	20			
Packaged AC CEE Tier 3	5%	10	25			
Refrigeration equipment with ECM motor	10%	10	25			
Refrigeration equipment with high efficiency compressor	40%	5	20			
High efficiency boiler (industrial)	10%	7	15			

Commercial retrofit measures

In completing the table below, please recall that the relevant metric is the annual percentage of eligible facilities that a program could influence to undertake the retrofit.

2012	Results from ECW Survey of Experts		IAMU Input	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)
Retrocommissioning	1%	3%		
HVAC motor retrofitted with VSD	3%	8%		
T8 retrofit	3%	6%		

2012	**Results from ECW Survey of Experts**		**IAMU Input**	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**
CFL retrofit	3%	5%		
Daylighting control retrofit	1%	4%		
Lighting control/occupancy sensor retrofit	3%	8%		
Refrigeration equipment retrofitted with ECM motor	2%	7%		
Refrigeration equipment retrofitted with high effic. compressor	2%	3%		
Refrigeration retrofitted with strip curtains/anti-sweat heater controls	5%	10%		

Industrial Energy Efficiency

Industrial retrofit measures

In completing the table below, please recall that the relevant metric is the annual percentage of eligible facilities that a program could influence to undertake the retrofit.

2012	**Results from ECW Survey of Experts**		**IAMU Input**	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**
High efficiency fluorescent retrofit	4%	7%		
High output T5 retrofit	1%	2%		
Pulse start metal halide retrofit	1%	1%		
LED lighting retrofit	0%	1%		
Audit & O&M improvement for compressed air systems	4%	6%		
Compressor control retrofit	3%	4%		

2012	**Results from ECW Survey of Experts**		**IAMU Input**	
	Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Moderate Programs (% of eligible facilities that undertake the retrofit)**	**Annual Impact of Aggressive Programs (% of eligible facilities that undertake the retrofit)**
VSD for compressor motor	0%	1%		
High efficiency compressor	1%	4%		
Steam trap maintenance	2%	6%		
Boiler control retrofit	3%	6%		
VSD for steam distribution system (pumps and draft fans)	3%	7%		
Audit & O&M improvement for pump systems	5%	8%		
Trim impeller to match demand (pump systems)	1%	4%		
VSD for pump motor	5%	7%		

Thank you for your help with this analysis.

Appendix 3

Tables of Goals and Related Data for Municipal Electric Utilities

Utility	Joint Action Agency	Goals (% of Sales)			Goals (kWh)			Projected Spending		
		2010	2011	2012	2010	2011	2012	2010	2011	2012
Afton	RPGI	0.70%	0.91%	1.41%	43,284	56,247	86,473	$ 3,928	$ 4,410	$ 8,035
Akron		0.60%	0.80%	1.10%	91,505	123,866	173,060	$ 57,979	$ 70,780	$ 74,590
Algona	NIMECA	0.60%	0.80%	1.10%	638,559	862,580	1,202,685	$ 249,688	$ 214,613	$ 142,191
Alta	NIMECA	0.60%	0.80%	1.10%	96,598	131,666	183,175	$ 43,292	$ 29,397	$ 98,512
Alta Vista		0.60%	0.80%	1.10%	12,219	16,178	22,127	$ 1,037	$ 1,851	$ 2,630
Alton	MRES‡									
Ames		0.54%	0.56%	0.69%	3,223,817	3,223,817	4,029,771	$ 800,000	$ 800,000	$ 1,000,000
Anita	RPGI	0.60%	0.80%	1.10%	59,009	79,929	112,269	$ 5,680	$ 8,374	$ 12,724
Anthon	WIMECA	0.60%	0.80%	1.10%	41,051	55,701	78,114	$ 7,582	$ 8,284	$ 10,918
Aplington		0.60%	0.80%	1.10%	45,731	64,393	90,884	$ 6,755	$ 8,933	$ 12,133
Atlantic		0.80%	0.50%	0.70%	790,846	500,736	684,254	$ 97,377	$ 82,355	$ 110,881
Auburn		0.60%	0.80%	1.10%	11,082	14,992	20,977	$ 1,000	$ 1,474	$ 2,316
Aurelia	WIMECA	0.60%	0.80%	1.10%	51,112	67,119	94,094	$ 4,533	$ 8,711	$ 11,418
Bancroft	NIMECA	0.60%	0.80%	1.10%	74,670	100,199	137,939	$ 15,486	$ 15,910	$ 17,029
Bellevue	SIMECA	0.60%	0.80%	1.10%	110,383	149,103	205,632	$ 15,530	$ 23,571	$ 30,697
Bloomfield		0.60%	0.80%	1.10%	174,217	231,664	322,059	$ 19,588	$ 27,952	$ 38,933
Breda	MEAN	0.60%	0.80%	1.10%	26,405	35,151	48,317	$ 2,859	$ 4,221	$ 6,221
Brooklyn	SIMECA	0.60%	0.80%	1.10%	76,734	103,854	145,133	$ 9,198	$ 13,710	$ 19,278
Buffalo	MEAN	0.60%	0.80%	1.10%	33,031	49,907	66,835	$ 1,743	$ 2,568	$ 5,989
Burt		0.60%	0.80%	1.10%	21,364	28,801	39,768	$ 2,937	$ 3,368	$ 6,551
Callender		0.91%	1.22%	1.53%	20,855	28,265	35,869	$ 2,489	$ 2,789	$ 3,203
Carlisle	MEAN	0.60%	0.80%	1.10%	110,193	151,678	207,631	$ 14,846	$ 21,728	$ 29,054
Cascade	SIMECA	0.60%	0.80%	1.10%	109,962	145,164	201,318	$ 13,161	$ 17,526	$ 24,004
Cedar Falls		0.60%	0.75%	0.90%	2,731,968	3,445,150	4,220,106	$ 910,550	$ 956,078	$ 1,003,881
Coggon	RPGI	0.60%	0.80%	1.10%	21,722	28,509	39,436	$ 1,645	$ 2,440	$ 4,008
Coon Rapids	NIMECA	0.60%	0.80%	1.10%	105,469	137,571	188,240	$ 14,507	$ 18,745	$ 24,622
Corning	SIMECA	0.60%	0.80%	1.10%	119,177	159,075	220,826	$ 15,875	$ 20,339	$ 29,951
Corwith		0.81%	1.07%	1.34%	17,872	23,689	29,531	$ 1,838	$ 2,109	$ 2,999
Danville	RPGI	0.60%	0.80%	1.10%	33,951	45,326	62,047	$ 2,578	$ 4,471	$ 9,015
Dayton		0.60%	0.80%	1.10%	31,462	41,969	57,890	2500	$ 3,732	$ 7,556
Denison	MRES‡									
Denver	MEAN	0.60%	0.80%	1.10%	80,254	107,079	150,650	$ 7,953	$ 12,140	$ 15,597
Dike	RPGI	0.60%	0.80%	1.10%	35,154	44,279	60,031	$ 3,171	$ 3,281	$ 5,163
Durant	SIMECA	0.60%	0.80%	1.10%	80,803	111,728	154,725	$ 12,272	$ 16,945	$ 23,175
Dysart	RPGI	0.60%	0.80%	1.10%	53,981	72,905	101,381	$ 4,840	$ 5,536	$ 9,583
Earlville	SIMECA	0.60%	0.80%	1.10%	32,654	44,570	62,180	$ 4,270	$ 6,401	$ 9,963
Eldridge		0.60%	0.80%	1.10%	216,125	294,260	414,773	$ 22,781	$ 29,942	$ 43,912
Ellsworth		0.60%	0.80%	1.10%	31,266	43,148	62,417	$ 3,267	$ 4,594	$ 7,125
Estherville		0.60%	0.80%	1.10%	360,300	483,513	674,521	$ 45,024	$ 59,235	$ 80,826
Fairbank		0.60%	0.80%	1.10%	46,298	62,624	87,572	$ 7,501	$ 8,962	$ 11,194
Farnhamville		0.60%	0.80%	1.10%	32,174	46,119	65,977	$ 2,936	$ 4,457	$ 6,903
Fonda	MEAN	0.60%	0.80%	1.10%	29,192	38,852	53,824	$ 3,043	$ 4,489	$ 6,632
Fontanelle	SIMECA	0.70%	0.80%	1.50%	47,222	54,132	101,926	$ 8,801	$ 11,912	$ 17,248

Utility	Joint Action Agency	Goals (% of Sales)			Goals (kWh)			Projected Spending		
		2010	2011	2012	2010	2011	2012	2010	2011	2012
Forest City		0.60%	0.80%	1.10%	225,084	318,085	449,830	$ 20,690	$ 32,901	$ 45,936
Fredericksburg		0.60%	0.80%	1.10%	111,787	153,046	193,446	$ 14,054	$ 17,593	$ 23,125
Glidden		0.60%	0.80%	1.10%	54,551	72,770	100,545	$ 9,171	$ 13,242	$ 15,803
Gowrie	SIMECA	0.60%	0.80%	1.10%	45,558	60,853	84,678	$ 6,473	$ 10,629	$ 11,820
Graettinger	NIMECA	0.60%	0.80%	1.10%	59,095	79,494	110,905	$ 14,092	$ 14,503	$ 18,884
Grafton		0.83%	1.12%	1.40%	18,435	24,562	30,719	$ 2,500	$ 3,104	$ 3,482
Grand Junction	RPGI	0.60%	0.80%	1.10%	32,492	44,092	60,831	$ 2,261	$ 3,933	$ 6,139
Greenfield*	SIMECA	0.60%	0.80%	1.10%	118,765	160,385	223,023	$ 23,724	$ 30,190	$ 39,814
Grundy Center	NIMECA	0.64%	0.84%	0.86%	185,243	242,948	246,370	$ 20,243	$ 39,929	$ 66,216
Guttenberg		1.00%	1.50%	2.00%	166,247	244,049	319,929	$ 22,613	$ 27,096	$ 34,477
Harlan		0.60%	0.80%	1.10%	372,320	498,653	691,317	$ 50,000	$ 63,700	$ 75,880
Hartley	MRES‡									
Hawarden	MRES‡									
Hinton	WIMECA	0.60%	0.80%	1.10%	53,516	70,990	100,767	$ 7,101	$ 9,143	$ 14,945
Hopkinton	RPGI	0.60%	0.80%	1.10%	27,030	35,133	47,736	$ 1,953	$ 3,575	$ 5,238
Hudson		0.60%	0.80%	1.10%	82,756	112,573	155,870	$ 8,196	$ 10,939	$ 17,884
Independence	WPPI	0.60%	0.80%	1.10%	352,773	464,692	623,708	$ 50,534	$ 59,909	$ 83,222
Indianola	MEAN	0.60%	0.80%	1.00%	682,400	911,635	1,150,292	$ 87,111	$ 115,424	$ 127,638
Keosauqua	WPPI	0.60%	0.80%	1.10%	81,241	108,266	150,539	$ 12,073	$ 11,315	$ 19,082
Kimballton	MRES‡									
La Porte City	RPGI	0.60%	0.80%	1.10%	96,397	129,085	178,552	$ 6,959	$ 9,651	$ 15,911
Lake Mills		0.60%	0.80%	1.10%	239,020	321,858	448,724	$ 27,450	$ 39,336	$ 43,075
Lake Park	MRES‡									
Lake View		0.60%	0.80%	1.10%	119,843	161,034	224,393	$ 13,148	$ 17,660	$ 23,617
Lamoni	SIMECA	0.43%	0.58%	0.80%	97,912	131,695	184,583	$ 11,510	$ 15,282	$ 23,177
Larchwood		0.60%	0.80%	1.10%	43,367	62,097	87,434	$ 3,999	$ 6,329	$ 9,410
Laurens	NIMECA	0.75%	0.75%	1.10%	221,071	222,377	330,093	$ 31,048	$ 31,608	$ 46,458
Lawler		0.60%	0.80%	1.10%	16,596	22,195	30,397	$ 3,544	$ 4,074	$ 5,345
Lehigh		0.76%	0.83%	0.95%	19,752	21,996	25,693	$ 1,018	$ 1,270	$ 1,736
Lenox	SIMECA	0.60%	0.80%	1.10%	102,835	137,102	189,236	$ 13,906	$ 18,120	$ 24,253
Livermore		0.70%	0.70%	0.80%	18,382	17,883	19,870	$ 6,758	$ 1,807	$ 1,906
Long Grove	RPGI	0.60%	0.80%	1.10%	17,822	23,801	33,254	$ 2,891	$ 3,040	$ 4,249
Manilla	MRES‡									
Manning**	WIMECA	0.60%	0.80%	1.10%	124,143	168,769	235,238	$ 23,522	$ 28,773	$ 36,103
Mapleton	WIMECA	0.60%	0.80%	1.10%	88,693	121,355	170,710	$ 12,628	$ 16,205	$ 21,865
Maquoketa	WPPI	0.60%	0.80%	1.10%	466,216	632,308	893,292	$ 59,408	$ 76,311	$ 117,086
Marathon		0.60%	0.80%	1.10%	12,327	16,314	22,059	$ 4,423	$ 5,868	$ 7,884
McGregor		0.50%	0.60%	0.75%	37,064	45,188	56,717	$ 4,174	$ 5,627	$ 6,952
Milford†	NIMECA	10.06%	1.00%	1.10%	3,194,018	312,451	344,512	$ 166,572	$ 40,654	$ 40,654
Montezuma		0.60%	0.80%	1.10%	99,384	133,902	186,040	$ 13,470	$ 16,735	$ 21,696
Mount Pleasant	RPGI	0.60%	0.80%	1.10%	435,277	583,131	818,048	$ 43,948	$ 70,418	$ 94,746
Muscatine		1.50%	0.73%	0.77%	13,078,255	6,415,034	6,809,607	$ 897,606	$ 499,780	$ 645,005

Utility	Joint Action Agency	Goals (% of Sales)			Goals (kWh)			Projected Spending		
		2010	2011	2012	2010	2011	2012	2010	2011	2012
Neola		0.60%	0.80%	1.10%	29,332	39,795	55,974	$ 2,912	$ 3,899	$ 5,794
New Hampton	NIMECA	0.60%	0.80%	1.00%	319,824	421,634	531,066	$ 41,784	$ 46,243	$ 68,731
New London	RPGI	0.60%	0.80%	1.10%	86,487	114,693	143,487	$ 10,354	$ 12,766	$ 15,478
Ogden	RPGI	0.60%	0.80%	1.10%	81,955	107,868	149,717	$ 14,583	$ 14,583	$ 18,164
Onawa	WIMECA	0.60%	0.80%	1.10%	202,815	277,290	387,999	$ 22,385	$ 29,534	$ 40,817
Orange City	MRES‡									
Orient	SIMECA	0.60%	0.80%	1.10%	14,532	19,589	27,837	$ 2,030	$ 2,586	$ 3,880
Osage		0.60%	0.80%	1.10%	321,773	426,955	594,363	$ 37,474	$ 47,858	$ 55,437
Panora		0.60%	0.80%	1.10%	76,249	102,342	143,390	$ 10,022	$ 14,592	$ 19,265
Paton		0.60%	0.80%	1.10%	12,236	16,476	23,113	$ 1,735	$ 2,090	$ 2,650
Paullina	MRES‡									
Pella		0.34%	0.46%	0.57%	661,957	860,944	1,053,950	$ 87,459	$ 112,352	$ 137,370
Pocahontas		1.23%	1.23%	1.23%	258,167	261,907	271,541	$ 24,113	$ 24,399	$ 25,180
Preston	WPPI	0.60%	0.80%	1.10%	49,569	66,669	93,389	$ 8,230	$ 13,110	$ 16,393
Primghar	MRES‡									
Readlyn		0.60%	0.80%	1.10%	28,887	39,259	54,436	$ 6,077	$ 6,822	$ 8,642
Remsen	MRES‡									
Renwick*		0.60%	0.80%	1.10%	14,883	19,818	27,357	$ 1,231	$ 1,720	$ 2,706
Rock Rapids	MRES‡									
Rockford	MEAN	0.60%	0.80%	1.10%	35,903	46,798	64,992	$ 4,654	$ 6,199	$ 9,659
Sabula		0.60%	0.80%	1.10%	20,914	27,043	36,277	$ 2,149	$ 3,403	$ 6,661
Sanborn	MRES‡									
Sergeant Bluff	MEAN	0.60%	0.80%	1.10%	201,794	270,209	377,868	$ 29,363	$ 43,824	$ 57,923
Shelby	MRES‡									
Sibley	RPGI	0.60%	0.80%	1.10%	218,487	290,360	398,143	$ 17,649	$ 31,273	$ 37,242
Sioux Center	MRES‡									
Spencer	NIMECA	0.70%	0.90%	1.10%	1,132,135	1,460,121	1,805,105	$ 285,300	$ 322,059	$ 487,988
Stanhope	RPGI	0.60%	0.80%	1.10%	16,540	21,605	29,644	$ 3,255	$ 2,147	$ 2,193
Stanton		0.60%	0.80%	1.10%	26,405	35,151	48,317	$ 4,567	$ 6,736	$ 9,335
State Center	RPGI	0.60%	0.80%	1.10%	76,131	101,956	141,912	$ 9,904	$ 13,453	$ 17,177
Story City	RPGI	0.61%	0.74%	0.83%	321,156	373,028	424,091	$ 36,967	$ 37,873	$ 44,018
Stratford		0.68%	0.68%	1.10%	28,944	27,913	45,182	$ 7,497	$ 7,417	$ 9,536
Strawberry Point	RPGI	0.60%	0.80%	1.10%	46,005	60,327	81,903	$ 16,098	$ 15,330	$ 17,511
Stuart	SIMECA	0.60%	0.80%	1.10%	85,740	115,448	159,706	$ 12,119	$ 14,608	$ 21,268
Sumner	NIMECA	0.60%	0.80%	1.10%	94,859	127,432	174,314	$ 17,208	$ 38,816	$ 20,546
Tipton	RPGI	0.60%	0.80%	1.10%	178,394	239,635	333,302	$ 23,285	$ 33,702	$ 47,955
Traer	RPGI	0.60%	0.80%	1.10%	90,689	120,145	166,704	$ 11,033	$ 18,020	$ 32,638
Villisca	SIMECA	0.60%	0.80%	1.10%	73,886	96,254	133,439	$ 12,013	$ 15,230	$ 15,513
Vinton	RPGI	0.60%	0.80%	1.10%	230,279	308,168	432,124	$ 22,676	$ 25,017	$ 43,895
Wall Lake	MEAN	0.60%	0.80%	1.10%	54,008	72,407	100,873	$ 5,349	$ 8,553	$ 9,278
Waverly	MEAN	0.44%	0.74%	0.90%	654,375	1,127,521	1,408,167	$ 197,973	$ 203,078	$ 208,459
Webster City*	NIMECA	0.60%	0.80%	1.10%	399,151	534,317	741,515	$ 58,863	$ 81,322	$ 111,204

Utility	Joint Action Agency	Goals (% of Sales)			Goals (kWh)			Projected Spending		
		2010	2011	2012	2010	2011	2012	2010	2011	2012
West Bend	NIMECA	0.88%	1.02%	0.64%	123,743	144,627	91,698	$ 11,680	$ 13,540	$ 11,889
West Liberty*	RPGI	0.60%	0.80%	1.10%	146,343	196,800	274,055	$ 10,597	$ 12,632	$ 23,900
West Point		0.60%	0.80%	1.10%	76,249	102,342	143,390	$ 11,768	$ 14,135	$ 20,622
Westfield		0.60%	0.80%	1.10%	7,575	10,428	13,017	$ 790	$ 939	$ 1,468
Whittemore*	RPGI	0.49%	0.69%	1.11%	22,942	31,435	51,126	$ 1,408	$ 1,731	$ 4,353
Wilton		0.60%	0.80%	1.10%	149,655	199,829	278,135	$ 14,764	$ 22,011	$ 29,294
Winterset	SIMECA	0.60%	0.80%	1.10%	275,767	367,935	510,461	$ 36,029	$ 47,960	$ 64,328
Woodbine	MRES‡									
Woolstock		0.60%	0.80%	1.10%	13,205	16,705	23,746	$ 593	$ 1,658	$ 2,350
Average		**0.71%**	**0.81%**	**1.09%**	**317,727**	**284,071**	**358,935**	**$44,073**	**$44,160**	**$ 54,801**
Total					**38,127,277**	**34,088,483**	**43,072,222**	**$5,288,748**	**$5,299,226**	**$ 6,576,081**

* Goals are for residential and commercial sectors

** Goals exclude portion of industrial sector

† Milford has two large lighting retrofit projects that are contributing to the high savings for 2010.

‡ For the goals and spending levels of the utilites who belong to MRES, please see the report submitted by MRES in Appendix 8

MEAN: Municipal Energy Agency of Nebraska

MRES: Missouri River Energy Services

NIMECA: North Iowa Municipal Electric Cooperative Association

RPGI: Resale Power Group of Iowa

SIMECA: South Iowa Municipal Electric Cooperative Association

WPPI: WPPI Energy

Appendix 4

Tables of Goals and Related Data for Municipal Gas Utilities

Utility	Goals (% of Sales)			Goals (therms)			Projected Spending		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Alton	0.40%	0.60%	0.74%	2,646	4,163	5,058	$ 7,250	$ 10,940	$ 13,628
Bedford	0.40%	0.60%	0.74%	2,824	4,301	5,122	$ 7,169	$ 11,378	$ 11,703
Bloomfield	0.40%	0.60%	0.74%	6,516	9,843	11,924	$ 11,786	$ 17,285	$ 20,386
Brighton	0.40%	0.60%	0.74%	992	1,472	1,718	$ 5,876	$ 7,219	$ 7,384
Brooklyn	0.40%	0.60%	0.74%	3,350	5,296	6,639	$ 6,523	$ 9,740	$ 12,700
Cascade	0.40%	0.60%	0.74%	4,142	6,483	8,033	$ 9,411	$ 14,770	$ 17,192
Cedar Falls	0.51%	0.60%	0.65%	8,919	10,416	10,738	$ 379,435	$ 398,407	$ 418,327
Clearfield	0.50%	0.60%	0.74%	986	1,211	1,493	$ 1,709	$ 2,471	$ 2,754
Coon Rapids	0.50%	0.60%	0.74%	5,310	6,136	7,172	$ 10,469	$ 12,182	$ 13,899
Corning	0.40%	0.60%	0.74%	4,490	6,746	7,971	$ 9,953	$ 15,247	$ 18,476
Emmetsburg	0.40%	0.60%	0.74%	11,623	18,399	22,567	$ 22,815	$ 36,700	$ 42,886
Everly*	0.40%	0.60%	0.74%	1,510	2,485	2,954	$ 4,058	$ 5,226	$ 5,981
Fairbank	0.40%	0.60%	0.74%	1,644	2,575	3,182	$ 4,668	$ 7,149	$ 9,274
Gilmore City*	0.40%	0.60%	0.74%	1,827	2,339	2,489	$ 5,538	$ 7,061	$ 7,179
Graettinger	0.40%	0.60%	0.74%	2,067	3,242	3,975	$ 3,753	$ 5,089	$ 6,560
Guthrie Center	0.40%	0.60%	0.74%	5,702	8,648	10,431	$ 8,812	$ 13,281	$ 15,811
Harlan*	0.40%	0.60%	0.74%	11,899	18,757	23,073	$ 30,000	$ 41,196	$ 46,931
Hartley	0.40%	0.60%	0.74%	3,403	5,220	6,082	$ 8,044	$ 11,800	$ 13,689
Hawarden**	0.40%	0.60%	0.74%	4,140	6,302	7,453	$ 8,733	$ 13,945	$ 16,443
Lake Park*	0.40%	0.60%	0.74%	2,721	4,433	5,429	$ 5,380	$ 8,883	$ 11,239
Lamoni	0.40%	0.60%	0.74%	3,787	5,872	7,171	$ 6,694	$ 11,153	$ 13,871
Lenox*	0.40%	0.60%	0.74%	2,679	4,229	5,560	$ 4,936	$ 7,105	$ 8,971
Lineville	0.40%	0.60%	0.74%	459	715	850	$ 585	$ 977	$ 1,794
Lorimor	0.40%	0.60%	0.74%	629	945	1,124	$ 1,800	$ 2,509	$ 3,485
Manilla*	0.40%	0.60%	0.74%	1,292	1,985	2,404	$ 5,568	$ 8,227	$ 9,308
Manning*	0.50%	0.60%	0.74%	4,742	5,882	7,147	$ 8,981	$ 10,418	$ 12,420
Mapleton	0.2%	0.4%	0.6%	1,137	2,273	3,410	$ 2,752	$ 6,190	$ 12,429
Montezuma	0.50%	0.80%	0.94%	7,065	11,372	13,055	$ 13,620	$ 19,894	$ 22,117
Morning Sun	0.40%	0.60%	0.74%	1,443	2,177	2,584	$ 2,714	$ 4,416	$ 6,173
Moulton	0.40%	0.60%	0.74%	1,222	1,865	2,289	$ 2,847	$ 3,795	$ 4,478
Orange City*	0.40%	0.60%	0.74%	12,245	19,492	24,938	$ 28,352	$ 44,481	$ 56,393
Osage	0.40%	0.60%	0.74%	13,290	20,395	25,240	$ 25,101	$ 36,602	$ 44,335
Prescott	0.40%	0.60%	0.74%	422	624	750	$ 1,089	$ 1,332	$ 1,442
Preston	0.43%	0.57%	0.71%	2,339	3,137	3,902	$ 5,834	$ 6,643	$ 8,144
Remsen	0.40%	0.60%	0.74%	3,325	5,223	6,300	$ 6,102	$ 10,117	$ 11,422
Rock Rapids	0.40%	0.60%	0.74%	6,258	9,821	11,973	$ 17,788	$ 28,069	$ 33,201
Rolfe*	0.40%	0.60%	0.74%	1,441	2,160	2,606	$ 5,212	$ 6,707	$ 6,956
Sabula	0.40%	0.60%	0.74%	1,177	1,760	2,103	$ 5,207	$ 6,515	$ 6,852
Sac City	0.40%	0.60%	0.74%	5,855	8,806	10,625	$ 11,773	$ 18,078	$ 21,525
Sanborn*	0.40%	0.60%	0.74%	3,108	5,274	6,673	$ 6,202	$ 9,975	$ 13,222
Sioux Center*	0.40%	0.60%	0.74%	17,155	26,032	31,124	$ 32,011	$ 45,511	$ 54,015
Tipton	0.40%	0.60%	0.74%	7,706	11,929	14,437	$ 12,516	$ 19,236	$ 27,102
Titonka†	0.40%	0.60%	0.74%	884	1,326	1,635	$ 2,000	$ 3,000	$ 4,000
Wall Lake*	0.40%	0.60%	0.74%	909	1,417	1,818	$ 2,115	$ 3,583	$ 4,363
Waukee	0.40%	0.60%	0.74%	17,036	27,546	35,834	$ 46,685	$ 75,579	$ 97,733

Utility	Goals (% of Sales)			Goals (therms)			Projected Spending		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Wayland	0.50%	0.60%	0.75%	2,678	3,285	4,027	$ 7,123	$ 7,639	$ 9,309
Wellman	0.40%	0.60%	0.74%	2,834	4,545	5,545	$ 9,672	$ 13,936	$ 14,445
West Bend	0.40%	0.60%	0.74%	3,358	5,184	6,241	$ 10,129	$ 13,467	$ 16,069
Whittemore*	0.50%	0.60%	0.74%	1,616	1,956	2,209	$ 3,479	$ 4,658	$ 5,273
Winfield	0.45%	0.60%	0.75%	2,222	3,137	3,903	$ 4,101	$ 5,742	$ 6,702
Woodbine	0.40%	0.60%	0.74%	2,621	4,031	4,855	$ 5,105	$ 6,672	$ 8,162
Average	0.41%	0.60%	0.74%	4,307	6,527	7,957	16,656	21,416	24,670
Total				219,643	332,863	405,832	$ 849,476	$ 1,092,195	$ 1,258,156

*Goals are for residential and commercial sectors

**Goals exclude some industrial customers

†Titonka is a propane utility

Appendix 5

Tables of Goals and Related Data Non-Municipal Electric Utilities

Amana Society Service Co.

Farmers Electric Cooperative – Kalona

Utility	Joint Action Agency	Goals (% of Sales)			Goals (kWh)			Projected Spending		
		2010	2011	2012	2010	2011	2012	2010	2011	2012
Amana Society Service Co.*	RPGI	0.11%	0.15%	0.20%	99,979	132,160	180,869	$ 8,232	$ 9,233	$ 21,253
Farmers Electric Cooperative (Kalona)	RPGI	0.60%	0.80%	1.10%	135,418	187,865	264,986	$ 33,329	$ 54,499	$ 62,138

* Goals are for residential and commercial sectors

RPGI: Resale Power Group of Iowa

Tables of Goals and Related Data for Non-Municipal Gas Utilities

Allerton Gas Co.

Consumers Service (Gas Utility) – Marshalltown

Utility	Goals (% of Sales)			Goals (therms)			Projected Spending		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Allerton*	0.30%	0.70%	0.83%	656	1,541	1,779	$ 6,982	$ 7,603	$ 7,775
Consumers Energy	0.20%	0.20%	0.20%	812	851	850	$ 1,605	$ 1,681	$ 1,681

Consumers Energy

Consumers Energy is committed to assisting our customers use natural gas as efficiently as possible. Consumers Energy started selling natural gas in 2001, and currently serves approximately 450 retail customers. These are residential customers that live in houses that have been built since the beginning of 2001. Our customer base grew from 2001 through 2007 as new houses were built, but since then has stayed constant with no new construction. We do not expect any new home construction in our natural gas service territory over the next several year. Because we have a small customer basis of homes built since 2006 and there is no projected new construction, Consumers Energy has limited potential for helping its customers use natural gas more efficiently. Because all the homes in Consumer Energy's service territory have been built since the beginning of 2001, there is little opportunity for retrofit energy efficiency improvements in these home. No projected new construction in our service territory means that there is no opportunity for energy efficiency gains through new construction programs.

In the past Consumers Energy has offered a $100 rebate on a high efficiency furnace and a $25 rebate on high efficiency storage natural gas water heater. Consumers Energy will continue to offer these rebates. To expand our energy efficiency program we are considering prescriptive rebates on programmable thermostats, and high efficiency tankless water heaters. We are also considering offering rebates on Energy Star® rated clothes washers and dishwashers to customers who use natural gas for heating water. Finally, we are considering providing faucet aerators, low flow showerheads, and water heater insulation tank wrap to customers with natural gas water heaters. Consumers Energy will continue to evaluate other opportunities for energy efficiency as new technologies develop and if our customer makeup changes.

Descriptions of Programs and Measures

Appendix 7.1 Residential and small commercial Energy Star prescriptive appliance rebate programs
Appendix 7.2 Lighting
Appendix 7.3 Residential prescriptive rebates for high-efficiency heating, cooling, and gas water heating
Appendix 7.4 Residential audit and weatherization incentives
Appendix 7.5 Commercial and industrial prescriptive program for lighting, motors, variable frequency drive, large heating and cooling systems, water heating, and refrigeration
Appendix 7.6 Non-residential custom programs
Appendix 7.7 Customer Education

eco@home™ Energy Efficiency Program

Residential and Small Commercial ENERGY STAR Products Program

This document contains recommended criteria for both gas and electric utilities. It is not intended for distribution to customers. Your final version will contain only programs applicable to your utility type. For incentive amount E=electric utility, G= gas utility, and E/G is appropriate for either E or G or a split

Requirements: Equipment must be installed in a home or small business within the Utility's service territory and the Utility must supply the electricity or gas for the appliance.

Appliance	Description	Incentive Amount	Additional qualifications
Refrigerator	ENERGY STAR qualifying refrigerators (10 cubic ft. or larger)	E $50	
Freezer	ENERGY STAR qualifying freezers (10 cubic ft. or larger)	E $25	
Clothes washer	ENERGY STAR qualifying clothes washers	E/G $50	Customer must use utility's fuel for water heating.
Dishwasher	ENERGY STAR qualifying dishwashers (standard size only)	E/G $20	Customer must use utility's fuel for water heating.
Dehumidifier	Energy Star qualifying dehumidifier	E $10	
Room air conditioner	ENERGY STAR qualifying room air conditioners	E $25	

*Maximum lifetime rebate limit per customer limit on ENERGY STAR appliances: $225

The Utility does not guarantee that the installation and operation of energy efficiency equipment will result in reduced usage or demand or in cost savings. The Utility makes no warranties, expressed or implied, with respect to any equipment purchased and/or installed, including, but not limited to, any warranty of merchantability or fitness for a particular purpose. In no event shall the Utility be liable for any incidental or consequential damages or injuries resulting from defective equipment of installation.

The Utility reserves the right to cancel or change these programs at any time. The Utility's acceptance of a rebate application does not guarantee payment of the incentive.

Residential & Small Business ENERGY STAR Products Program

Program Element	**Residential and Small Business ENERGY STAR Products Program**
Objective	ENERGY STAR qualified appliances use 10 to 50% less energy and water than standard models. The objective of the Residential and Small Business ENERGY STAR Products Program is to increase the adoption of high efficiency ENERGY STAR products sold through retail markets. The incentives are expected to encourage retailers to be more aware of these products and encourage customers to consider their benefits. It is expected over time, as the products become more widely accepted and prices are reduced, that the incentives can be reduced or eliminated, since the products will be commonly preferred by customers.
Target Market	All residential and small business customers receiving service from the Utility and purchasing ENERGY STAR products through area retail business are eligible for the program. All retail businesses that carry or could carry ENERGY STAR products may be eligible to participate in the program.
Program Duration	Starts January 2010 or when utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted or until appropriate notice is given.
Program Description	The Residential and Small Business ENERGY STAR Products Program will provide market incentives and market support through retailers to build market share and usage of ENERGY STAR products. Special in-store sales support will stimulate demand for the products and make it easier for store participation. The program targets both residential and small business customers who purchase ENERGY STAR products through market channels, retail businesses and special sales events. The products to be included will vary over time as new ENERGY STAR products are developed or existing products become widely adopted and no longer need incentives to encourage purchase. The program is designed to: • Provide incentives to customers for the purchase and installation of products to reduce energy use in the home or in small business and information about other programs that encourage the installation of high efficiency equipment, such as lighting, room air conditioners, electronics, appliances and other ENERGY STAR labeled products. • Provide a marketing mechanism for retailer and high efficiency product suppliers to promote energy-efficient equipment and products to end users. • Ensure that the participation process is clear, easy to understand and simple for the customer and contractor. The key to success for the Residential and Small Business ENERGY STAR Program is working through retailers at the point of purchase and with market channels for product supply. Through joint marketing, retail support, and special promotions more product is offered and promoted making the buying decision easy for customers. Another important aspect of success is to leverage the ENERGY STAR brand for marketing and promotion. National events such as the "Change a Light, Change the World" campaign help increase national awareness that spills over into the Utility service territory and increases demand. There are several barriers addressed through the program. The first barrier is price. Retail purchase incentives are provided for customers to lower upfront cost of the item and stimulate interest. Besides making the initial cost lower, the Utility incentive provides an endorsement to the energy saving value of the ENERGY STAR product. The second barrier is retailer participation. Through retailer education, in-field sales support and stimulated market demand, retailers will stock more product, provide special promotions and plan sales

	strategies around these ENERGY STAR products. Additional support is provided through manufacturers that often can reduce prices as sales volumes of ENERGY STAR products increase. Coordination will occur with national ENERGY STAR initiatives. Certain barriers exist to the customer's adoption of energy efficiency products, including limited financial resources, competition for funds with other household budget items, lack of awareness/knowledge about the features, benefits and costs of energy efficiency products, difficulty of finding retailers carrying the products, and energy saving performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency products used in the market. Having a simple program structure and incentive schedule provides customers with certainty and ease of use regarding the incentives they will receive for installing a wide variety of energy efficiency products.
Eligibility	Technologies that will be included in the program will change over time. The initial ENERGY STAR technologies to be included are: • Refrigerators • Freezer • Clothes Washers • Dishwasher • Dehumidifiers • Room Air Conditioners Measures will be added or removed based on market response, technology availability and changes in ENERGY STAR standards. Technologies must be cost-effective to be included.
Implementation Strategy	The Utility will provide local program management, customer marketing, retailer relationships and retailer solicitation and support. IAMU, in conjunction with The Utility, and/or another service provider, will provide implementation services, including education and training, application and incentive processing, incentive payments, tracking, verification, technical support, Utility support, and development of general marketing materials. Incentives will be available in several ways that will be adapted to the retail partner needs and market response. The strategies that might be used include: • Mail-in forms available from The Utility, the retailer and online. • In-store "Instant Reward" events that occur at the time of purchase. • Customer coupons sent by Utility to target customers and redeemable at a specific business. • Special sale events in retail facilities Initial incentives for the proposed ENERGY STAR products listed above in Eligible Measures are shown in the Information on page 1. Incentives may change based on market prices and response as well as manufacturer/distributor co-funding. Other incentive strategies will be determined as experience is gained in the market. These might include manufacturer buy-down or retailer mark-down or incentives to retailer sales representative. To the extent practicable, implementation of this program will be coordinated with other utilities having similar programs in the Utility's market area.
Marketing Strategy	Training and ENERGY STAR product materials will be provided to retailer sales staff, with additional sales aids provided as needed. The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach

	to the retailer community, relevant trade associations and other parties of interest in the market. An important part of the marketing plan will be content and functionality of the web sites of the Utility, IAMU, and/or other service providers, which will give customers information about the program, and links to the ENERGY STAR web site. A combination of strategies will be used to train and support retailers, including media advertising, outreach community forums and events, and direct outreach to customers and retailers. Marketing activities may include: • Point of purchase displays and materials, advertising by retailers, coupons, and special "instant sales events." • Public relations materials. • Brochures that describe the benefits and features of the program, including program application forms and processes. The brochures will be available for various public awareness events (presentations, seminars etc). • Bill inserts, bill messages and email messages. • Utility website content providing program information, contact information, downloadable application forms, and links to other relevant service and information resources. These materials will also be available on the IAMU web site. • Customer representatives will be trained to promote the program to their customers. • Presence at conferences and public events will be used to increase general awareness of the program and distribute program promotional materials.
Evaluation, Measurement, & Requirements	The Residential and Small Commercial ENERGY STAR Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh or gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide the Utility with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered. For every incentive, proper paper documentation will be verified. Field verification of installed measures will be made on a random sample of smaller projects. Utility intends that products or measures will be added or eliminated from the program based on cost-effectiveness, market acceptance and standard practice. They will also be added as new products, measures and technologies emerge in the market.

eco@home™ Energy Efficiency Program

Residential and Small Commercial ENERGY STAR Compact Fluorescent Lighting

This document contains recommended criteria for electric utilities. It is not intended for distribution to customers. Lighting programs are for electric utilities only.

IAMU recommends electric utilities adopt a residential lighting program that provides either free compact fluorescent light (CFL) bulbs to residents or offers a rebate of $2.00 per bulb. For bulb give away programs, it is recommended that the utility purchase high quality ENERGY STAR-rated bulbs.

Option 1: Participation in statewide Change A Light Program

The Change A Light program, is an annual statewide CFL promotion program that is coordinated between all of Iowa's electric utilities. The program has been developed by and is administered by the Wisconsin Energy Conservation Corporation. The program promotes the purchase of CFLs through retail buy down of bulbs (the store price of the bulbs is reduced) or an instant in-store coupon. In 2009 the program is running from October 1 through December 31.

WECC provides all administrative and energy savings calculations for the program. When a utility signs up for Change A Light, WECC recruits retail stores to participate, develops and delivers marketing materials to the stores and utility, and tracks the bulbs purchased by customers of each participating utility. At the end of the program, WECC sends a report to the utility summarizing the number of bulbs purchased by the utility's customers through the program and the resulting savings. IAMU helps to inform municipal utilities of the annual program.

Option 2: Community Distribution of CFLs: Utility Rebate or Give-Away

A residential CFL program lends itself well to Community Energy Efficiency events and to events conducted by volunteer or school groups. We suggest planning at least one of these events annually to speed implementation of this program, and to assist your customers in installing these bulbs in the best application. IAMU anticipates purchasing these bulbs in bulk from a lighting distributor providing ENERGY STAR qualified compact fluorescent bulbs to obtain quantity discounts on bulbs. More information on community CFL programs follows on the pages below. As an alternative a community distribution of CFL's the utility could provide a $2 rebate per bulb purchased by a utility customer.

Residential & Small Business ENERGY Star Compact Fluorescent Lighting

Program Element	Community Distribution of Compact Fluorescent Light Bulbs
Objective	Compact fluorescent light (CFL) bulbs are designed to have a longer life span and use less energy than standard light bulbs. Providing the CFL bulbs to customers encourages their adoption and provides an easy way to engage customers in energy efficiency practices. It is expected over time, as the products become more widely accepted and prices are reduced, that the incentives can be reduced or eliminated, since the products will be commonly preferred by customers.
Target Market	All residential and small business customers receiving service from the Utility are eligible for the program.
Program Duration	Starts January 2010 or when utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted or until appropriate notice is given.
Program Description	The Residential and Small Business Lighting Program will provide compact fluorescent bulbs to the utility's customers. The program is designed to: • Provide CFL light bulbs to customers. Utility bulk purchases will reduce the overall cost of each bulb. • Help inform customers about energy efficient practices and programs. Certain barriers exist to the customer's adoption of energy efficiency products, including limited financial resources, competition for funds with other household budget items, lack of awareness/knowledge about the features, benefits and costs of energy efficiency products, difficulty of finding retailers carrying the products, and energy saving performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency products used in the market.
Eligibility	All residential and small business customers receiving service from the Utility are eligible for the program.
Implementation Strategy	The Utility will provide local program management, customer marketing, retailer relationships and retailer solicitation and support. IAMU, in conjunction with The Utility, and/or another service provider, will provide implementation services, including education and training, tracking, verification, Utility support, and development of general marketing materials. Various implementation strategies that might be used include: • Provide $2 rebate per bulb purchased by customer • Distribution of bulbs through the utility office. • Coordination with local community or school groups to distribute bulbs to customers • Distribution of bulbs at community festivals/fairs • Distribution during a community energy efficiency blitz To the extent practicable, implementation of this program will be coordinated with other utilities having similar programs in the Utility's market area.
Marketing Strategy	The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to relevant trade associations and other parties of interest in the market.

	Marketing activities may include: • Public relations materials. • Brochures that describe the benefits and features of the program, including program application forms and processes. The brochures will be available for various public awareness events (presentations, seminars etc). • Bill inserts, bill messages and email messages. • Utility website content providing program information, contact information, and links to other relevant service and information resources. These materials will also be available on the IAMU web site. • Customer representatives will be trained to promote the program to their customers. • Presence at conferences and public events will be used to increase general awareness of the program and distribute program promotional materials.
Evaluation, Management & Verification Requirements	The Residential and Small Commercial Lighting Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh or gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide program managers with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered.

The Utility does not guarantee that the installation and operation of energy efficiency equipment will result in reduced usage or demand or in cost savings. The Utility makes no warranties, expressed or implied, with respect to any equipment purchased and/or installed, including, but not limited to, any warranty of merchantability or fitness for a particular purpose. In no event shall the Utility be liable for any incidental or consequential damages or injuries resulting from defective equipment of installation.

The Utility reserves the right to cancel or change these programs at any time.

eco@home™ Residential HVAC Information

Eligible Equipment

This document contains recommended criteria for both gas and electric utilities. It is not intended for distribution to customers. Your final version will contain only programs applicable to your utility type. These incentives are only provided as examples, and omit administrative costs. Final incentives will depend on spending levels.

Program Appliances	Qualification	Incentive
Air Conditioners		
Central AC (for units < 65,000 Btu)	≥ SEER 14.5	$100 (E)
Central AC (for units < 65,000 Btu)	≥ SEER 16	$200 (E)
Room Air Conditioners	ENERGY STAR rated (Eligibility is defined in the Energy Star Products program.)	$25 (E)
Heat Pumps		
Air Source	SEER ≥ 14.5 & HSPF ≥ 8.2	$200 (E)
Air Source	SEER ≥ 16.0 & HSPF ≥ 8.8	$400 (E)
Ground-Source (180,000 Btu or 15 tons or less)	New System: Closed Loop Minimum EER ≥ 14.1 and COP ≥ 3.3	$2,000 (E)
Ground-Source (180,000 Btu or 15 tons or less)	New System: Open Loop Minimum EER ≥ 16.2 and COP ≥ 3.6	$1,000 (E)
Desuperheater (Additional incentive for air or ground source units with this technology.)	(A desuperheater is a small, auxiliary heat exchanger that uses superheated gases from the heat pump's compressor to heat water. This hot water then circulates through a pipe to the home's storage water heater tank.)	$100 (E)

SEER = Seasonal Energy Efficiency Ratio
HSPF = Heating Seasonal Performance Factor
EER = Energy Efficiency Ratio
COP = Coefficient of Performance
AFUE = Annual Fuel Utilization Efficiency
EF = Energy Factor

Natural Gas Furnaces (Municipal Gas Utility Rebates)		
Forced Air	Minimum AFUE ≥ 90%	$200 (G)
Forced Air	AFUE ≥ 94%	$325 (G)
Forced Air	AFUE ≥ 96%	$400 (G)
Boiler	Minimum AFUE ≥ 85%	$150 (G)
Boiler	AFUE ≥ 90%	$400 (G)
Clock-Programmable Thermostats	(After December 2009 programmable thermostats will no longer be Energy Star rated)	$25 (G)
Natural Gas Furnace Fan Motor (Municipal Electric Utility Rebate)		
Efficient Fan Motor for Natural Gas Furnace	Electrically Commutated Motor Customer must receive electric service from the utility. New or replacement fan motor of a gas furnace.	$50 (E)
Gas Water Heaters (Municipal Gas Utility Rebates)		
Natural gas tank-type	EF ≥ 0.62	$50 (G)
Natural gas whole-home tankless	EF ≥ 0.82	$100 (G)
Electric Water Heater (Municipal Electric Utility Rebate)		
Heat Pump Water Heater	Energy Star Spec: EF ≥ 2.0	$100 (E)

SEER = Seasonal Energy Efficiency Ratio
HSPF = Heating Seasonal Performance Factor
EER = Energy Efficiency Ratio
COP = Coefficient of Performance
AFUE = Annual Fuel Utilization Efficiency
EF = Energy Factor

NOTE: The utility may add as a condition of receiving a rebate on an air conditioner or furnace (or for any rebate) acceptance by the customer of the utility's right to employ reasonable load control strategies on the customer's equipment.

eco@home™ Residential HVAC Information

Program Element	Utility Residential HVAC Program
Objective	The objective of the Residential HVAC Program is to encourage residential customers to install energy-efficient space heating and cooling and water heating equipment.
Target Market	All residential customers receiving service from The Utility are eligible for this program. The primary target market are the HVAC and plumbing contractors who specify and replace the space and water heating and cooling equipment in a home.
Program Duration	Starts January 2010 or when utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted or until appropriate notice is given.
Program Description	The Residential HVAC Program provides incentives to residential customers for installing energy-efficient space cooling, space heating, and water heating equipment. This program will pertain to existing homes installing new equipment and to new homes. Incentives will be provided to the home owner and will be based on fulfilling the energy efficiency requirements. More specifically, the program is designed to: • Provide incentives to purchase high efficiency equipment as specified within the program. • Provide technical information, education and training to homeowners, contractors, and builders so that they can understand the benefits of the high efficiency alternatives and provide high efficiency alternatives as the best choice to consumers. • Provide a marketing mechanism for contractors and equipment distributors to promote high efficiency equipment. • Ensure that the participation process is clear, easy to understand and simple. Certain barriers exist to the adoption of energy-efficient equipment, including lack of investment capital, competition for funds with other home investments or amenities, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, lack of education and skills of the contractor, and technology performance uncertainties. If the equipment is replaced without electric or gas efficiency in mind, there might not be the opportunity to make these improvements until many years later when the equipment fails. Avoiding this lost opportunity at the time of replacement allows energy efficiency to be optimized and is usually less costly than equipment replacement at a later time. This program is designed to help overcome these market barriers and encourage greater adoption of energy-efficient HVAC and water heating equipment in the residential market.
Eligible Measures	The technologies to be included within this program are high efficiency space and water heating and cooling equipment. Guidelines for equipment specified as high efficiency will change over time as manufactured equipment specifications change. Please see page 1 for the initial efficiency standards to be included. Measures will be added or removed based on market response, technology availability and changes in ENERGY STAR standards. Technologies must be cost-effective, to be included in the program.

Implementation Strategy	The Utility will provide local program management, customer marketing, and trade ally relationships and support. IAMU, in conjunction with The Utility, and/or or another service provider, will provide implementation services, including education and training, tracking, verification, technical support, Utility support, and development of general marketing materials. To make the Residential HVAC Program effective, the Utility will work with equipment distributors and HVAC and plumbing contractors. Those market participants are key in making sure high efficiency HVAC and water heating equipment is available, and key for selling the high efficiency alternative directly to customers as customers replace their old and failing equipment. By having these market participants sell and promote energy-efficient equipment, customers will better understand the benefits of the higher efficiency choices. The incentives for the program will be paid to the customer once the equipment is installed and is verified as complying with the minimum standards. The initial incentive levels are described on page 1 of this document.

Marketing Strategy	The marketing and communications strategy will be designed to inform homeowners, contractors and equipment distributors of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including contractors, equipment distributors, trade associations, and other parties of interest in the market.
	
	Marketing and communications plan may include:
	
	• A combination of strategies including local media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key contractors such as:
	  o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon request and distributed through The Utility and the website. They will also be available through various public awareness events (presentations, home shows, etc).
	  o Targeted direct mailings used to educate homeowners on the benefits of the program and explaining how they can apply.
	  o Customer and trade partner outreach and presentations informing interested parties about the benefits of the program and how to participate.
	  o Print advertisements to promote the program placed in selected local media including the local area newspapers and trade publications.
	  o The Utility website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
	  o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
	  o Presentations to customers and trade allies to actively solicit their participation in the program.
	• Education seminars implemented in each market to provide details about how to participate in the program. The seminars will be tailored to the needs of homeowners, contractors and equipment distributors.
	• The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
	• IAMU will oversee the development of content, messaging, branding, and calls to action of the marketing and collateral materials used to promote the program.

EM&V Requirements	The evaluation of the Residential HVAC Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh or gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide program managers with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered. For every incentive, proper paper documentation will be verified. Field verification of installed measures will be made on a random sample of smaller projects. The Utility intends that products or measures will be added or eliminated from the program based on cost-effectiveness, market acceptance and standard practice. They will also be added as new products, measures and technologies emerge in the market.

eco@home™ Energy Efficiency Program

Residential Audit and Weatherization Program

This document contains recommended criteria for both gas and electric utilities. It is not intended for distribution to customers. Coordinating agreements with investor-owned and REC utilities have been discussed, but are not yet firm. IAMU has agreements with some qualified audit firms, but many more are needed to provide reasonable access to firms throughout the state.

Online Self Audit		
Electric Utility	All customers are eligible	Service provided without charge
Gas Utility	All customers are eligible	Service provided without charge
On Site Audit		
Electric Utility	Primary heating fuel: Gas	Audit available only if agreement for cost-sharing is in place with gas company
Electric Utility	Primary heating fuel: Electricity	Audit available at utility expense (A customer co-payment may be required)
Gas Utility	Primary heating fuel: Gas	Utility will pay for audit and may cost-share with cooperating electric utility (A customer co-payment may be required)
Gas Utility	Primary heating fuel: Electric	No program available
Gas or Electric Utility	Primary heating type Other	No program available

The following additional eligibility criteria apply to onsite audits:

- Customers must receive service in their name from the gas or electric Utility
- Customers must live in single family homes or multifamily building of 4 units or less
- Homes built after 1999 are not eligible
- Residential customers served through a commercial meter are not eligible
- Homes that have previously received an in-home audit during the past 5 years by either the gas or the electric company are not eligible

Payments and Incentives

Incentives Installed During Audit	
Gas or Electric Utility	• Up to 5 CFLs, if customer of participating electric utility (E) • Programmable thermostat (E/G, depending on primary space heating type) If applicable, E/G thermostat cost share is same ratio as insulation. Customer co-pay may be required. • Up to 2 energy saving shower heads (E/G depending on water heater type) • Up to two energy-saving faucet aerators (E/G depending on water heater type) • 6 feet of hot water pipe insulation (E/G depending on water heater type)

Audit-Related Payments and Incentives		
Electric Utility (with Gas utility cost-sharing)	Primary heating type Gas	• 20% of the combined audit cost incentive • 100% of the measures that reduce electric use • 20% of the combined insulation incentive: 70% of installed cost of insulation up to $750
Electric Utility (no Gas utility cost-sharing)	Primary heating type Electricity	• 100% of the audit cost incentive • 100% of the measures installed during audit • 100% of the cost of insulation incentive: 70% of installed cost of insulation up to $750
Gas Utility (with Electric utility cost-sharing)	Primary heating type Gas	• 80% of the combined audit cost incentive • 100% of the measures that reduce gas use • 80% of the combined E/G insulation incentive: 70% of installed cost of insulation up to $750
Gas Utility (no Electric utility cost-sharing)	Primary heating type Gas	• 100% of the audit cost incentive • 100% of the measures installed during audit • 100% of the cost of insulation incentive: 70% of installed cost of insulation up to $750
Gas or Electric Utility	Primary heating type Other	No program available

Recommended Residential Insulation Levels	
Insulation Location	**R-Value**
Attic	R-49
Wall Cavity	R-15
Wall Insulation Sheathing	R-5
Floor over unheated area	R-25
Basement Wall Interior	R-11
Crawl Space Wall	R-25

(Source: U.S. Department of Energy)

eco@home Energy Efficiency Program
Residential Audit and Weatherization Program

Program Element	Utility Residential Audit and Weatherization Program
Objective	The objective of the Residential Audit and Weatherization Program is to provide online and in-home energy information and easy to install measures to help customers take action to reduce energy use. Additional insulation incentives will help customer save more energy. This program will be offered in conjunction with the customer's other utility provider if the other utility has a similar audit and weatherization program.
Target Market	The Level 1 program (the online self audit) is targeted to all Utility residential customers' homes of four units or less. Since most homes are heated with gas, the Level 2 program (the in-home audit) provides substantial benefits to municipal gas utilities. For gas Utilities, the targeted customers will be all residential gas customers' homes of four units or less. Due to the limited electric benefits for electric municipal utilities from Level 2, the audits of the program for electric utilities are targeted to all residential homes of four units or less who are served by a gas company providing a similar audit and weatherization program. IAMU will coordinate program implementation with other utility companies that offer similar programs.
Program Duration	Starts January 2010 or when the utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted or until appropriate notice is given.
Program Description	The Residential Audit and Weatherization Program will provide energy audit services to residential customers living in single family homes and multifamily building of 4 units or less. The audit will include two levels of audit service - online self audits and in-home audits. Level 1 – The Online Self Audit o This measure is for all Utility Customers. o This online self audit will interact with online home energy audit tool. o This audit tool will also be available in a convenient mail in survey. Level 2 – In-Home Audit for homes built before December 31, 1998 o This program is available to all gas Utility customers. It is also available to electric Utility customers who are served by a gas company with a similar program. o The in-home audit program provides energy customers with homes built before December 31, 1998, with an on-site home audit. o The audit will include the free installation of low-cost energy efficiency measures. o The energy expert will analyze many features of the home, including: • Building construction and tightness • Heating and cooling systems (if applicable, the energy expert will install an ENERGY STAR® rated clock-programmable thermostat for $30 plus tax.) • Kitchen and laundry appliances • Lighting (if applicable, the energy expert will install ENERGY STAR rated compact fluorescent light bulbs) • Water heating equipment (if applicable, the energy expert will install up to two faucet aerators, two low-flow showerhead, six feet of pipe insulation and water heater insulation wrap) • Windows, doors and insulation levels o The energy expert will provide the estimated cost for thermal shell improvements and estimated energy cost savings. o The energy expert will also provide to the customer a list of contractors for the installation of these additional measures.

	o If within one year the customer installs insulation measures recommended in the survey (ceiling, foundation/crawl space or in-wall), the customer will be eligible to receive incentives of up to 70 percent of the total cost of contract installation labor and equipment, up to a maximum of $750 for each type of insulation. o The energy expert will provide the customer with energy education, both product and behavioral, and recommend other applicable Utility programs. The single family market has significant barriers to energy efficiency. The primary barrier is a lack of awareness and knowledge as to the ways that they can improve their home and change behaviors to save energy. Another major barrier is the lack of funds to make needed improvements to their homes that would save energy and money. Home owners have little time to implement energy efficiency measures. By providing energy audits at various levels, the homeowner can improve their efficiency and reduce energy costs. This program is designed to help overcome these barriers and improve energy efficiency for this customer group who has large energy needs and a large potential for savings. For electric Utilities, this program will be provided with coordination between the Utility and the gas company providing a similar service. Since most homes are served with gas space heat, the electric Utility will pay for the installation of the CFLs and any other measure saving only electricity and 20% of the insulation incentives and the programmable thermostat installation. For total electric homes, the electric Utility will pay the entire cost of the audit and 100% of the measures installed during the survey and 100% of the insulation incentives. If the gas company does not have a similar program, only the Level 1 – Online Self Audit will be available.
Eligible Measures	The audit will include the following systems and measures: o Lighting, including CFL incentives o HVAC controls, including programmable thermostat incentive (5-day, 1-day, 1-day), if applicable o Inspection of thermal shell and appliances o Savings estimate and estimated cost of insulation measures o Water heating, including the following incentives • LF shower head • Faucet aerators • 6 feet of hot water pipe insulation • Water heater insulation wrap o Building insulation measures o Review of Utility incentives and other program offerings
Implementation Strategy	The Utility will provide local program management and customer marketing. IAMU, in conjunction with The Utility and/or another service provider, will provide implementation services, including contracting with the auditing firm and/or letters of understanding with other utilities providing similar services, education and training, application and incentive processing, incentive payments, tracking, verification, technical support, Utility support, and development of general marketing materials. IAMU will also provide coordination with other utilities providing similar services. The auditing firm will be responsible for receiving customer's audit requests, scheduling appointments, conducting the audits, installing energy saving measures, providing additional energy saving recommendations and providing the required records to the Utility and/or IAMU. For Level 1 – The Online Self Audit is available to all Utility residential customers. Level 2 is an In Home Audit. For gas Utilities the Level 2 audit program is offered to all customers. The customer can contact the gas Utility or the energy auditing firm to schedule the survey.

	For electric Utilities the Level 2 audit program will be offered to customers where the gas provider is offering a similar program and where incentive costs are shared by the utilities. Utility plans to collaborate with other Iowa utilities, when feasible, to deliver the Residential Audit and Weatherization Program so both electric and natural gas measures are covered.
Marketing Strategy	Education and promotional materials will be developed for all residential customers. The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate. There will also be relations built with home remodelers and realtors about the program. Additional communication will be provided through insulation contractors and news media. Marketing activities will include: • Direct mail to potential participant customers based on zip codes that indicate an age of homes that would likely benefit from the audit program. • Public relations materials and general media will be used for the program. • Brochures that describe the benefits and features of the program including program contact information. The brochures will be available for various public awareness events (presentations, seminars, etc). • Bill inserts, bill messages and email messages to targeted customers. • Informational content on the Utility website. • Customer representatives trained to promote the program to their customers. • The marketing strategy will identify key trade ally groups for target marketing, and will prepare specific outreach activities for them. • Presentations to key trade ally groups to actively solicit their participation in the program.
EM&V Requirements	The evaluation of the Residential Audit and Weatherization Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh and gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide program managers with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered. For every incentive, proper paper documentation will be verified. Field verification of installed measures will be made on a random sample of projects. IAMU intends that products or measures will be added or eliminated from the program based on cost-effectiveness, market acceptance and standard practice. They will also be added as new products, measures and technologies emerge in the market.

eco@work™ Commercial and Industrial Prescriptive Incentives

This document contains information on prescriptive rebates the Utility may offer to commercial and industrial customers for:

- Lighting
- Motors
- Variable Frequency Drives (For Motors)
- Commercial Kitchen Equipment
- Heating and Cooling Equipment
- Domestic Water Heating Equipment
- Insulation

This document contains recommended criteria for both gas and electric utilities. It is not intended for distribution to customers. Your final version will contain only programs applicable to your utility type. For incentive amount E=electric utility, G= gas utility, and E/G is appropriate for either E or G or a split incentive for combination utilities. These incentives are only provided as examples, and omit administrative costs. Final incentives will depend on spending levels. Recommendations will be provided in your final version.

Commercial and Industrial Lighting (Electric Only)					
Equipment	**Fixture Size**	**# Of Lamps**	**Lamp Type**	**Incentive for Building Retrofit**	**Incentive for New Construction**
Replace T12 Fixtures with T8 or T5 Fixture in Low-Bay Applications (Mounting Height <15 feet)	2 Foot	2	T8 U-Bend	$10/fixture	N/A
	2 Foot	1	T8 or T5	$10/fixture	N/A
		2	T8 or T5	$10/fixture	N/A
	46 Inch	1	T5	$7/fixture	N/A
		2	T5	$14/fixture	N/A
		3	T5	$21/fixture	N/A
		4	T5	$28/fixture	N/A
		6	T5	$42/fixture	N/A
	4 Foot	1	T8	$6/fixture	N/A
		2	T8	$9/fixture	N/A
		3	T8	$14/fixture	N/A
		4	T8	$18/fixture	N/A
	8 Foot	1	T8 or T5	$8/fixture	N/A
		2	T8 or T5	$14/fixture	N/A
T8 or T5 HO High Bay Fixtures (Mounting Height ≥ 15 feet)	4 Foot	Any	T8 or T5 HO	$15/lamp	$8/lamp
Pulse Start Metal Halide Fixtures	320 Watt Replace 400 or larger lamp			$20/fixture	N/A
	750 Watt Replace 1,000 Watt or larger lamp			$30/fixture	N/A
Compact Fluorescent Fixture (Hard Wired Pin Base)	N/A	1	ENERGY STAR rated	$20/fixture	
Compact Fluorescent Lamps (screw-in)	N/A	1	ENERGY STAR rated	50% of purchase cost up to $2	50% of purchase cost up to $2
LED Strip/ Refrigerated Case Lighting	N/A	N/A	Light Emitting Diode	$2/linear foot	$2/linear foot
LED Exit Sign	N/A	N/A	Light Emitting Diode	$5	N/A
Occupancy Sensors (wall or ceiling mounted)	N/A	N/A	Must control > 400 Watts	$20 each	$20 each
Occupancy Sensors (Hi-Bay Mount)	N/A	N/A	Must control > 150 Watts	$20 each	$20 each

Motors and Variable Frequency Drives (Electric Only)			
Motor Horsepower	**Type**	**RPM**	**Incentive**
See table below for minimum efficiency requirements			
1 - 5 HP	Open or TEFC	1200	$15/HP
		1800	
		3600	
7.5 - 20 HP	Open or TEFC	1200	$10/HP
		1800	
		3600	
25 - 100 HP	Open or TEFC	1200	$5/HP
		1800	
		3600	
125 - 200 HP	Open or TEFC	1200	$4/HP
		1800	
		3600	
Variable Frequency Drive			$30/HP

NEMA PREMIUM® Motor Nominal Efficiency Requirements

Open Drip Proof (ODP) NEMA Premium Efficiency Rated 600 volts or less (random wound)				Totally Enclosed Fan cooled (TEFC) NEMA Premium Efficiency Rated 600 volts or less (random wound)			
Horse Power	**1200 RPM**	**1800 RPM**	**3600 RPM**	**Horse Power**	**1200 RPM**	**1800 RPM**	**3600 RPM**
1	82.5	85.5	77.0	1	82.5	85.5	77.0
1.5	86.5	86.5	84.0	1.5	87.5	86.5	84.0
2	87.5	86.5	85.5	2	88.5	86.5	85.5
3	88.5	89.5	85.5	3	89.5	89.5	86.5
5	89.5	89.5	86.5	5	89.5	89.5	88.5
7.5	90.2	91.0	88.5	7.5	91.0	91.7	89.5
10	91.7	91.7	89.5	10	91.0	91.7	90.2
15	91.7	93.0	90.2	15	91.7	92.4	91.0
20	92.4	93.0	91.0	20	91.7	93.0	91.0
25	93.0	93.6	91.7	25	93.0	93.6	91.7
30	93.6	94.1	91.7	30	93.0	93.6	91.7
40	94.1	94.1	92.4	40	94.1	94.1	92.4
50	94.1	94.5	93.0	50	94.1	94.5	93.0
60	94.5	95.0	93.6	60	94.5	95.0	93.6
75	94.5	95.0	93.6	75	94.5	95.4	93.6
100	95.0	95.4	93.6	100	95.0	95.4	95.0
125	95.0	95.4	93.6	125	95.0	95.8	95.0
150	95.4	95.8	95.0	150	95.8	96.2	95.4
200	95.4	95.8	95.0	200	95.8	96.2	95.8

Commercial Kitchen Equipment		
Equipment	**Qualification**	**Rebate**
Ice Maker	ENERGY STAR	$100 (E)
Solid Door Commercial Refrigerator	ENERGY STAR	$100 (E)
Solid Door Commercial Freezer	ENERGY STAR	$50 (E)
Hot Food Holding Cabinet	ENERGY STAR	$250 (E)
Food Steamer	ENERGY STAR	$100/Pan (E/G)
Fryer	ENERGY STAR	$300 (E/G)
Electric Convection Oven	Cooking Efficiency: 70%	$200 (E)
Gas Convection Oven	Cooking Efficiency: 44%	$200 (G)

Heating, Cooling, and Domestic Water Heating			
	Measure	**Qualification**	**Rebate**
Air-Cooled Air Conditioner	Split System Equipment <65,000 BTU/h	SEER ≥14.5	$100 (E)
		SEER ≥16	$200 (E)
	Rooftop/Unitary/Split System AC ≥65,000 Btu/h and <135,000 Btu/h	11.5 EER	($50 x (EER - 11.4)) x tons (E)
	Rooftop/Unitary/Split System AC ≥135,000 Btu/h and <240,000 Btu/h	11.5 EER	($50 x (EER - 11.4)) x tons (E)
	Rooftop/Unitary/Split System AC ≥240,000 Btu/h and <760,000 Btu/h	10.5 EER	($50 x (EER - 10.4)) x tons (E)
Air Source Heat Pumps	Split System Equipment <65,000 BTU/h	SEER ≥14.5	$200 (E)
		SEER ≥16	$400 (E)
	Rooftop/Unitary/Split System AC ≥65,000 Btu/h and <135,000 Btu/h	11.5 EER, COP 3.4	($50 x (EER - 11.4)) x tons (E)
	Rooftop/Unitary/Split System AC ≥135,000 Btu/h and <240,000 Btu/h	11.5 EER, COP 3.2	($50 x (EER - 11.4)) x tons (E)
	Rooftop/Unitary/Split System AC ≥240,000 Btu/h and <760,000 Btu/h	10.5 EER, COP 3.2	($50 x (EER - 10.4)) x tons (E)
Ground Source Heat Pumps	Closed Loop ≤240,000 Btu/h	14.1 EER, 3.3 COP	$2,000 (E)
	Open Loop ≤240,000 Btu/h	16.2 EER, 3.6 COP	$1,000 (E)
Furnace	Furnace <225,000 Btu/h	90% AFUE	$200 (G)
		94% AFUE	$325 (G)
		96% AFUE	$400 (G)
Boiler	Boiler <300,000 Btu/h	85% AFUE	$150 (G)
		90% AFUE	$400 (G)
Domestic Water Heating	Storage, Power Vented, <75,000 Btu/h and ≥30 gallons	EF ≥0.62	$50 (G)
	Tankless Water Heater	EF ≥0.80	$300 (G)
	Heat Pump Water Heater		$100 (G)

Nonresidential Insulation Program for Existing Buildings		
Attic/Roof/Wall Insulation	**Present insulation R-value brought up to State of Iowa Energy Code (2009 IECC)**	**70% of installation Cost up to $750**
To be eligible for this incentive, the customer must use The Utility's fuel as its primary heating source.		

Iowa Energy Code Commercial Building Insulation Levels			
Roofs	**Zone 5***	**Zone 6***	**Installation Notes**
Insulation entirely Above Deck	R-20 ci	R-20 ci	
Metal Buildings (with R-5 thermal blocks)	R-13 + R-13	R13 + R-19	First R-value: fiberglass batts draped over purlins Second R-value: fiberglass batts parallel to the purlins
Attic and Other	R-38	R-38	
Walls			
Mass	R-11.4 ci	R-13.3 ci	
Metal Building	R-13 + R-5.6 ci	R-13 + R-5.6 ci	First R-value: fiberglass batts between framing Second R-value is for continuous rigid insulation.
Metal Framed	R-13 + R-7.5 ci	R-13 + R-7.5 ci	
Wood framed and other	R-13 + R-3.8 ci	R-13 + R-7.5 ci	
Below Grade wall	R-7.5 ci	R-7.5 ci	ci = continuous insulation

* See table below for municipal utilities in climate zone 5, see table on next page for municipal utilities in climate zone 6

Municipal Utilities in Climate Zone 5				
Afton	Coon Rapids	Kimballton	Neola	Story City
Ames	Corning	Lamoni	New London	Stuart
Anita	Danville	Lenox	Ogden	Tipton
Anthon	Denison	Lineville	Onawa	Traer
Atlantic	Durant	Long Grove	Orient	Villisca
Bedford	Dysart	Lorimor	Panora	Vinton
Bellevue	Eldridge	Manilla	Paton	Waukee
Bloomfield	Fontanelle	Manning	Pella	Wayland
Breda	Glidden	Mapleton	Prescott	Wellman
Brighton	Grand Junction	Maquoketa	Preston	West Liberty
Brooklyn	Greenfield	Montezuma	Sabula	West Point
Buffalo	Guthrie Center	Morning Sun	Sergeant Bluff	Wilton
Carlisle	Harlan	Moulton	Shelby	Winfield
Cascade	Indianola	Mount Pleasant	Stanton	Winterset
Clearfield	Keosauqua	Muscatine	State Center	Woodbine
Coggon				

Municipal Utilities in Climate Zone 6				
Akron	Earlville	Hartley	McGregor	Sibley
Algona	Ellsworth	Hawarden	Milford	Sioux Center
Alta	Emmetsburg	Hinton	New Hampton	Spencer
Alta Vista	Estherville	Hopkinton	Orange City	Stanhope
Alton	Everly	Hudson	Osage	Stratford
Aplington	Fairbank	Independence	Paullina	Strawberry Point
Auburn	Farnhamville	La Porte City	Pocahontas	Sumner
Aurelia	Fonda	Lake Mills	Primghar	Titonka
Bancroft	Forest City	Lake Park	Readlyn	Wall Lake
Burt	Fredericksburg	Lake View	Remsen	Waverly
Callender	Gilmore City	Larchwood	Renwick	Webster City
Cedar Falls	Gowrie	Laurens	Rock Rapids	West Bend
Corwith	Graettinger	Lawler	Rockford	Westfield
Dayton	Grafton	Lehigh	Rolfe	Whittemore
Denver	Grundy Center	Livermore	Sac City	Woolstock
Dike	Guttenberg	Marathon	Sanborn	

eco@work™ Commercial and Industrial Prescriptive Incentive Program

Program Element	C&I Prescriptive Incentive Program
Objective	The objective of the C&I Prescriptive Program is to encourage the Utility's commercial and industrial (C&I) customers to install energy-efficient measures in existing and new facilities.
Target Market	All Utility C&I customers taking service from the Utility are eligible.
Program Duration	Starts January 2010 or when utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted or until appropriate notice is given.
Program Description	The Commercial and Industrial (C&I) Prescriptive Incentive Program provides incentives to the Utility's C&I customers for the installation of energy-efficient equipment for numerous applications including but not limited to the installation of energy-efficient lighting, motors and drives, heating, ventilation and air conditioning (HVAC), domestic water heating, cooking, refrigeration, and food service equipment. The program is structured as a broadly applicable C&I Prescriptive incentive program since the energy and demand savings for many common energy efficiency measures are similar across many C&I market segments. Having a simple program structure and incentive schedule provides customers and the market suppliers with certainty and ease of use regarding the incentives they will receive for installing a wide variety of energy efficiency measures. More specifically, the program is designed to: • Provide incentives to facility owners and operators for the installation of high efficiency equipment and controls. • Provide the knowledge necessary and market demand to justify the marketing of high efficiency measures by electrical contractors and their distributors. • Ensure that the participation process is clear, easy to understand and simple. Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information research costs, and technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the C&I market. The premise of the program is that through engagement and education with the market participants and through customer incentives to reduce upfront costs, the risks to energy efficiency system implementation will be reduced and the rewards from the savings will become more apparent thus increasing adoption.
Eligible Measures	The C&I Prescriptive Program is a customer incentive program for the installation of energy efficiency measures in non-residential facilities. The program offers customer incentives for these technologies: • High Efficiency Lighting • Motors/Drives • HVAC Equipment and Domestic Water Heating • Cooking and Refrigeration Equipment • Insulation Specific technologies included in the program will change over time based on codes and standards,

	changing market needs, introduction of new technologies and market adoption rates. Technologies must be cost-effective to be included.
Implementation Strategy	The Utility will provide for local program management, customer marketing, trade ally relationships and support. IAMU, in conjunction with The Utility, and/or another service provider will provide implementation services, including education and training, application and incentive processing, incentive payments, tracking, verification, technical support, and development of general marketing materials. The key to program success is twofold. First, The Utility will engage customer participants by using their existing market channel. This market delivery channel includes distributors, consultants, engineers and contractors. The Utility will have staff resources available for educating, partnering and engaging these important market actors in the program. Through these existing market actors who have relationships with C&I customers, the new high efficiency technologies will be offered to customers as a viable option. To support the market participants, the program also includes customer educational and promotional materials designed to assist facility owners, operators and decision makers with the information necessary to improve the energy efficiency of the systems in their facilities. Second, The Utility will use internal staff resources that have relationships with customers and can help identify opportunities to participate in the program. These resources will build customer awareness, educate the customer on opportunities and connect interested customers with the appropriate participating contractors. Incentives for each technology will be offered to reduce the cost of the energy-efficient equipment and will vary based on cost-effectiveness and market response. A full listing of the initial proposed technologies and their initial incentives is shown in Attachment A. Additional guidelines are established such as total incentives available per customer per year to assure that funds are allocated across a broad cross-section of customer opportunities.

Marketing Strategy	Education and promotional materials will be developed for building owners and operators on the benefits of energy efficiency improvements and improved systems performance, including educational brochures, customer and market provider seminars, program promotional material, and website content. Specific educational, training and promotional efforts will be aimed at market participants such as electrical contractors, building supply firms, and distributors to help them promote efficient measures to their customers. This education will be through a combination of mailings and direct meetings with key market participants.
	
	The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and market participants including A&E firms, the contractor community, relevant professional and trade associations and other interested parties.
	
	Marketing and communications plan may include:
	• A combination of strategies including major media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key customers and customer representatives such as:
	  o Brochures that describe the benefits and features of the program including program application forms and worksheets.
	  o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can apply.
	  o Customer and trade partner outreach and presentations informing interested parties about the benefits of the program and how to participate.
	  o Print advertisements to promote the program placed in selected local media including

	newspapers and trade publications in the Utility service territory. o Website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources. o Utility account managers informing their assigned accounts about the program during their regular communications. o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials. o Presentations to key customers and customer groups to actively solicit their participation in the program. • Educational seminars implemented in each market will provide details about the program and how to participate in the program. The seminars will be tailored to the needs of business owners, building managers, architects, engineers, vendors, and contractors. These educational seminars will include information on all energy efficiency programs provided by the Utility.
EM&V Requirements	The evaluation of the C&I Prescriptive Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh or gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide program managers with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered. For every incentive, proper paper documentation will be verified. Field verification of installed measures will be made on all large projects and on a random sample of smaller projects. The Utility intends that products or measures will be added or eliminated from the program based on cost-effectiveness, market acceptance and standard practice. They will also be added as new products, measures and technologies emerge in the market.

eco@work™ Energy Efficiency Program

Commercial and Industrial Custom Program

This document contains recommended criteria for both gas and electric utilities. It is not intended for distribution to customers. A custom commercial and industrial can be used by both electric and gas utilities.

Incentive:

- Incentives will be calculated based on the annual energy savings, installed project cost and payback. The incentive will use the lowest of the following.
    - First year annual energy savings
        - 8¢ per kWh saved
        - $4.00 per MCF saved
    - 50% of the installed project cost
    - Incentive needed to provide a 1 year payback after incentive
- The maximum incentive amount available per customer per year will be determined by the Utility.
- Incentives for electric savings will be paid by the electric Utility and incentives for gas savings will be paid by the gas Utility.
- To obtain a custom incentive from the Utility, a customer must obtain pre-approval from the Utility before the customer takes any steps to purchase new equipment or systems. To qualify for incentives under this program, the customer must receive written pre-approval from the local utility prior to the dates of any purchase orders, invoices, bills of lading, or other purchase or shipping documents for any equipment, materials or services relating to the project.

Equipment:

Examples of energy-efficient equipment that may qualify for incentives include:

- Boilers over 2.5 million Btu input capacity
- Ground-source heat pump systems 135 million Btuh or greater
- Premium-efficiency motors over 200 HP
- Process boiler, chiller and refrigeration improvements
- Energy management systems
- Direct-fired heating systems
- Thermal energy storage

Program Element	Commercial and Industrial Custom Program
Objective	The objective of the Commercial and Industrial Custom Program is to encourage Utility's commercial and industrial (C&I) customers to install energy-efficient measures in existing and new facilities.
Target Market	All C&I customers taking service from Utility are eligible for this program. The primary target market is existing C&I customers utilizing more complicated systems or processes in existing and new facilities.
Program Duration	Starts when utility funds the programs and makes applications available. It will continue until funds authorized for this program are exhausted.
Program Description	The Commercial and Industrial (C&I) Custom Program provides custom incentives to C&I customers for the installation of innovative and unique energy-efficient equipment and controls. Having a custom program allows efficiency measures and systems to be installed for situations specific to that customer's application or process. Incentives are to be offered on a per energy (kWh and MCF) and per demand (kW) basis based on pre-approved engineering estimates. This program targets energy savings equipment or processes as well as applications with so much variability in operating characteristics that standardized savings cannot be assumed across the customer base. This program also includes those technologies that are new to the market and have not yet established baseline savings. More specifically, the program is designed to: • Provide incentives to customers for the installation of high efficiency equipment, processes, systems and controls based on pre-approved engineering estimates. Utility will have final approval on all incentives. • Provide the knowledge necessary and market demand to justify the marketing of high efficiency measures by electrical contractors, mechanical contractors, and their distributors. • Ensure that the participation process is clear, easy to understand and simple. Where applicable, the Utility will work the other utiltiy company supplying services to the customer to coordinate incentives, processing and assistance for those measures or systems that apply to both fuels (ex: building shell measure improvements). Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information research costs, and technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the C&I market. The premise of the program is that through engagement and education of the customer, identifying opportunities to save energy, working with the market and financial incentives to reduce upfront costs, the risks to energy efficiency will be reduced and the rewards from the savings will become more apparent thus increasing adoption.
Eligible Measures	With a custom program, flexibility is the key. Technologies that are unique to that customer, new to the market or have a wide range of savings based on their application cannot be included in a prescriptive program due to their variability. However these variable energy savings technologies can be significant and encouraged through a custom incentive program. Measures must show electric energy and demand savings or gas savings through accepted engineering analysis that will be reviewed and pre-approved by Utility for the incentive. Measures cannot be funded through the C&I Custom Program if they are

	available through the C&I Prescriptive Program unless they are in combination with other measures or systems that makes them unique.
Implementation Strategy	The Utility will provide local program management, customer marketing, vendor referrals, coordination of education and training activities and customer project solicitation and support. IAMU will provide implementation support services, including education and training materials, tracking, verification, technical support and development of general marketing materials. As an option in the future, IAMU may provide application and incentive processing and incentive payments Success of the C&I Custom Program will center on working with customers to apply energy efficiency in unique ways to their operations and processes and working with the industry participants to find the right solutions to their needs. The primary key to success is utilizing the existing relationships of the Utility's internal staff who have relationships with customers and can help identify opportunities to participate in the program. These resources will build customer awareness, educate the customer, and work with engineering staff, supporting engineering firms and Energy Services Companies. Through the engagement of the market participants throughout the delivery channel, additional projects can be identified and potential solutions suggested. These participants include manufacturers, distributors, trade associations, consultants, engineers and contractors. The program will use Utility staff for educating, partnering and engaging these important participants in the program as they also discuss the prescriptive program offerings. Through these existing market participants who have relationships with C&I customers, new high efficiency technology and custom program solutions will be offered to customers as a viable option. To support the market participants, the program also includes customer educational and promotional pieces designed to provide facility owners, operators and decision makers with the information necessary to improve the energy efficiency of the systems in their facilities. Incentives will be set using a per kWh and per MCF. Incentive levels will vary over time based on costs and market need but will typically be established in one year increments. The Utility will use a standard incentive rate for technologies that are established and known in the market but need financial help to get them implemented. A higher incentive level will target technologies that are newer to the market or have more significant risk or other barriers that need higher stimulation and awareness. The higher incentive level may be established on a project bases by the Utility. The initial incentive levels per kWh or MCF that are proposed and the technology categories are outlined in Appendix A. Other guidelines to reduce free ridership will also be established. The initial guidelines are: • Simple payback for the project must be between 1 year and 8 years after the incentive is applied. • The maximum incentive will be adjusted to provide a 1 year payback. • Program incentives will not exceed 50% of the installed project cost. • Utility reserves the right to adjust these guidelines over time and to make exceptions. Additional guidelines such as total incentives available per customer per year are established to assure that funds are allocated across a broad cross-section of customer opportunities. This will be determined by the Utility. One barrier to getting measures identified and installed is getting customers to spend funds to analyze the opportunity and savings. To help address this issue, assessment/audit grants will be available to customers for up to 25% of the analysis cost not to exceed an amount to be determined by the Utility for facilities less than 25,000 square feet and not to exceed an amount to be determined by the Utility for larger facilities. If the customer implements that project, an additional bonus will be included in the incentive to cover an additional 25% of the assessment cost using the same cost caps. The implementation of this program will be coordinated with another utility as much as possible,

	depending on the similarity of the programs.

Marketing Strategy	The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and market participants including A&E firms, Energy Services Companies, the equipment supplier community, relevant professional and trade associations and other interested parties. An important part of the marketing plan will be content and functionality on the Utility website, which will direct customers to information about the program. Specific educational and promotional efforts aimed at market participants will be developed as needed. This education will be through a combination of mailings and direct meetings with key market participants. More specifically, the marketing and communications plan will include:
	• Education to provide details about how to participate in the program.
	• A combination of strategies including outreach and presentations at professional and business forums and events, and through direct outreach to key customers and customer representatives such as:
	  o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be available for various public awareness events (presentations, seminars, etc).
	  o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can apply.
	  o Customer and trade partner outreach and presentations informing interested parties about the benefits of the program and how to participate.
	  o Website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
	  o Utility account managers informing their assigned accounts about the program during their regular communications.
	  o Presence at business events used to increase general awareness of the program and distribute program promotional materials.
	  o Presentations to key customers and customer groups to actively solicit their participation in the program.
	• The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.

Milestones	The program will be launched within 60 days of the Utility's approval.
EM&V Requirements	The evaluation of the C&I Custom Program will have an energy impact evaluation and a process evaluation. The energy impact evaluation will focus on reliably estimating the program's gross annual kWh or gross annual MCF savings over the effective useful life of the energy efficient equipment installations, with estimates of the gross peak kW savings associated with those projects. The process evaluation is intended to provide program managers with timely recommendations on program operations, effectiveness and participant satisfaction so that mid-course corrections may be considered. For every incentive, proper paper documentation will be verified. Field verification of installed measures will be made on all large projects and on a random sample of smaller projects.

eco@home™ Energy Efficiency Program

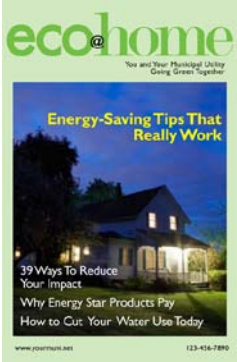
Customer Education

This document contains recommended criteria for electric and gas utilities. It is not intended for distribution to customers.

IAMU recommends that utilities adopt a customer education program. Customer education can change behavior. Such changes cannot currently be measured and will not help the utility achieve its stated goal, but progress is being made on metrics for educational programs. More importantly, customers who understand the potential savings they might get from an investment in energy efficiency are more likely to consider participation in utility programs. To that extent, customer education can also be seen as an essential part of program marketing.

Option 1: Distribution of eco@home magazine

eco@home is a quarterly publication created by the Iowa Association of Municipal Utilities for our members. It is a digest-sized, 12 page magazine that contains natural resource saving ideas for homeowners and renters. Easy-to-read, *eco@home* is designed to move readers to consume gas, electricity, and water more efficiently, saving dollars and our planet. Each article inspires and motivates the entire family to take action with ideas that are often low cost or no cost. This piece can serve as the foundation of your consumer education program. This is especially true for utilities that do not have their own "branded" energy efficiency programs, as eco@home and eco@work will be used in common marketing programs offered to IAMU members.



Research validates that consumers recognize the need to make wise choices and they have a desire to save money. This publication can become a reminder of the partnership between customers and their utility and a direct link to the utilities energy efficiency programs.. The utility's contact name and information are printed on the cover of each edition.

The *eco@home* customer communication magazine has been presented with the "Silver Pearl" Award from the Custom Publishing Council, in the category of "Editorial, Best New Newsletter." The Pearl Awards are the top honor in the field of "custom publishing." *Eco@Home* was nominated for the award by Lexicon Consulting, a custom media firm based in Des Moines, which coordinates the publication's editorial content.

Option 2: Other educational programs

IAMU is identifying sources for consumer educational materials, including materials for use in schools. Demonstration equipment, such as the bicycle-powered energy education unit described is already available from IAMU, along with promotional materials and a 10 foot inflatable model of a compact fluorescent light (CFL). These can be used in schools, energy fairs, and blitz events. The Center for Energy and Environmental Education at the University of Northern Iowa is also a source of educational materials.

Appendix 8

Missouri River Energy Services
Supplemental Report on Energy Efficiency Goals, Measures, Cost-Effectiveness

Report to the Iowa Utilities Board (IUB) Energy Efficiency Goals, Measures, Cost-Effectiveness January 1, 2010

Prepared by:

Missouri River Energy Services
On behalf of 16 of its Iowa Members

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Report to the Iowa Utilities Board (IUB)
Energy Efficiency Goals, Measures, Cost-Effectiveness
January 1, 2010
Report in response to Iowa Code 476.6 (16) (c)

Joint Report filed by:

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Executive Summary

Missouri River Energy Services (MRES) is a not-for-profit municipal power agency serving sixty member municipal utilities in Minnesota, Iowa, and North and South Dakota. Eighteen of these sixty communities are located in western Iowa. Sixteen of the eighteen Iowa members of MRES purchase supplemental wholesale power supply from MRES. These sixteen members have joined together to address the requirements of Iowa Code 476.6 (16) (c). MRES has provided other energy services to its Iowa members to assist them in meeting the requirements of Iowa Code 476.6 (16) (c), including integrated resource planning, studies of energy efficiency potential, and a portfolio of energy efficiency incentive programs called Bright Energy Solutions[SM]. MRES has prepared this joint report on behalf of the sixteen Iowa MRES members listed in on page two of this report.

In order to identify the most reliable, cost-effective manner for MRES to meet its obligation to supply energy to our member communities, MRES conducts an integrated resource planning study (Resource Plan) on a regular basis. In preparing a May 2006 update to the MRES Resource Plan, demand-side management (DSM), including energy efficiency and load management, was identified to be a least-cost resource in the optimal power supply mix for MRES. MRES conducted a study of energy efficiency potential (Potential Study) to determine the saturation of existing DSM measures that were already being done by our members, and to determine the remaining available potential for new DSM measures. In late 2008 through early 2009, MRES conducted a second Potential Study with PA Consulting of Madison, Wisconsin, to update the findings of the first study and to determine efficiency potential by state in order to fulfill the requirements of Iowa Code 476.6 (16) (c). That study determined that the market potential (maximum achievable potential) for the Iowa MRES members was .63 percent by the year 2020, or 3,406 megawatt-hours (MWhs).

Using the Potential Study as a guide, the Iowa MRES members held three strategic planning sessions to set energy efficiency goals and to develop an action plan to achieve those goals. The Iowa MRES members set goals for energy efficiency in their communities as follows:

Year	Goals	KWhs	MWhs
2010	0.3% of average kWh sold	1,575,899	1,575.90
2011	0.5% of average kWh sold	2,626,498	2,626.50
2012	0.8% of average kWh sold	4,202,397	4,202.40
2013	0.9% of average kWh sold	4,727,697	4,727.70
2014	1.0% of average kWh sold	5,252,997	5,253.00

In order to achieve the goals set forth by the Iowa MRES members, MRES and its Iowa members have developed a portfolio of energy efficiency incentive programs designed to encourage the installation of high efficiency electrical equipment in the commercial, industrial, and residential sectors. The programs have been branded Bright Energy Solutions SM (BES). The individual MRES Iowa members will participate in some or all of the BES programs, depending upon the opportunities for energy efficiency specific to their customer base. The following programs have been, or will be, developed for commercial and industrial (C&I) customers:

- Lighting Retrofit Program
- Lighting in New Construction Program
- Cooling/Chiller Program
- Motors/Pumps/VFD Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program – Schools and City Facilities
- New Construction Program
- Custom Rebate Program

The following programs have been, or will be, developed for residential customers:

- ENERGY STAR Products
- Residential Lighting Program
- Residential HVAC Program
- Appliance Turn-in Program
- New Construction Program

To analyze the cost-effectiveness of the efficiency programs, several program components were developed and evaluated, including participation estimates for each efficiency measure, kW and kWh savings estimates, incentive levels, and program administration costs. MRES and its Iowa members used an evaluation software tool called DSMore to estimate participation and evaluate cost-effectiveness of each of the efficiency programs and each of the measures within those programs. Based on that analysis, the following is an estimate of kWh savings that will be achieved by the Iowa MRES members with each of the energy efficiency programs:

	Estimated Annual kWh Savings				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program	**2010**	**2011**	**2012**	**2013**	**2014**
C&I Lighting	797,092	1,323,173	2,130,308	2,364,642	2,601,106
C&I Cooling/Chiller	29,197	48,468	78,033	107,528	155,236
C&I Motors/Pumps/VFD	47,712	79,202	127,515	141,542	155,891
C&I Custom & New Construction					
and Targeted Audits	226,721	376,219	605,584	672,175	739,371
C&I Food Service	5,780	9,594	15,447	19,962	25,370
C&I Specialty Equipment	17,809	29,563	47,597	52,833	58,116
Residential HVAC	89,662	147,943	236,709	267,481	296,904
Residential New Construction	7,502	12,378	19,804	22,379	24,840
Residential Appliance Turn-in	176,286	290,872	465,396	525,897	583,746
ENERGY STAR Products	260,545	429,899	687,839	777,258	862,756
Totals	**1,658,306**	**2,747,311**	**4,414,232**	**4,951,697**	**5,503,336**

These estimated savings will meet or exceed the energy efficiency goals set by the Iowa MRES members.

The following is an estimate of the cost of implementing the efficiency programs over the reporting period of 2010 through 2012.

TOTAL PROGRAM BUDGETS

	Residential	C&I	Total Budget
2010	$118,893	$116,122	$235,015
2011	$186,752	$192,165	$388,917
2012	$315,770	$308,408	$624,177

The following chart shows the overall cost-effectiveness of the portfolio of energy efficiency programs offered by the Iowa MRES members, using Standard Practice Manual Tests:

Standard Practice Manual Tests	**Test Results**
	Today's Value
Utility Cost Test	3.76
Total Resource Cost Test	2.14
Rate Payer Impact Test	0.85
Rate Payer Impact (Net Fuel)	1.41
Societal Test	2.29
Participant Test	3.03

The Standard Practice Manual Tests and the test results are further described on pages 46 and 47the report.

The Iowa MRES members have committed to offering and promoting energy efficiency programs to all sectors of their customer base, starting with a goal of .3 percent savings of average retail sales in 2010 and ramping up to a goal of one percent savings per year by 2014. They have developed an action plan to achieve these goals and committed the resources needed to do so. Energy efficiency provides a least-cost resource for MRES and its Iowa members, along with financial and educational benefits to customers, and environmental benefits for everyone.

Energy Efficiency Potential Study

In order to identify the most reliable, cost-effective manner for MRES to meet its obligation to supply power to our member communities, MRES conducts an integrated resource planning study on a regular basis. As part of the resource planning process, MRES conducted our first energy efficiency Potential Study for the entire MRES membership in early 2006. That original study was not segmented by state and it relied heavily on data from other utilities in the region. In 2008, MRES hired PA Consulting Group of Madison, Wisconsin, to conduct a more detailed energy efficiency Potential Study and asked PA Consulting to segment the results by state, so that our study could fulfill the needs of the Iowa MRES members under Iowa Code 476.6 (16) (c).

The objective of the 2008 Potential Study was to project the technical, economic and market potential of DSM measures for MRES members and their customers for the period of 2010 – 2030. The results of the Potential Study will be used to provide input into DSM planning and goal setting by state, as well as to inform capacity expansion modeling and assist in the development of future Resource Plans for MRES.

The Potential Study reviewed 84 types of residential, commercial, and industrial energy efficiency measures, including all measures that were included in the MRES 2006 Potential Study, plus additional measures that are included in the Minnesota deemed savings database, developed by the Minnesota Office of Energy Security (MOES). Those measures include technologies in the areas of appliances, cooling and heating, lighting, water heating, electric cooking, plug loads, process equipment, refrigeration, roofing, envelope measures, direct load control, and other miscellaneous measures.

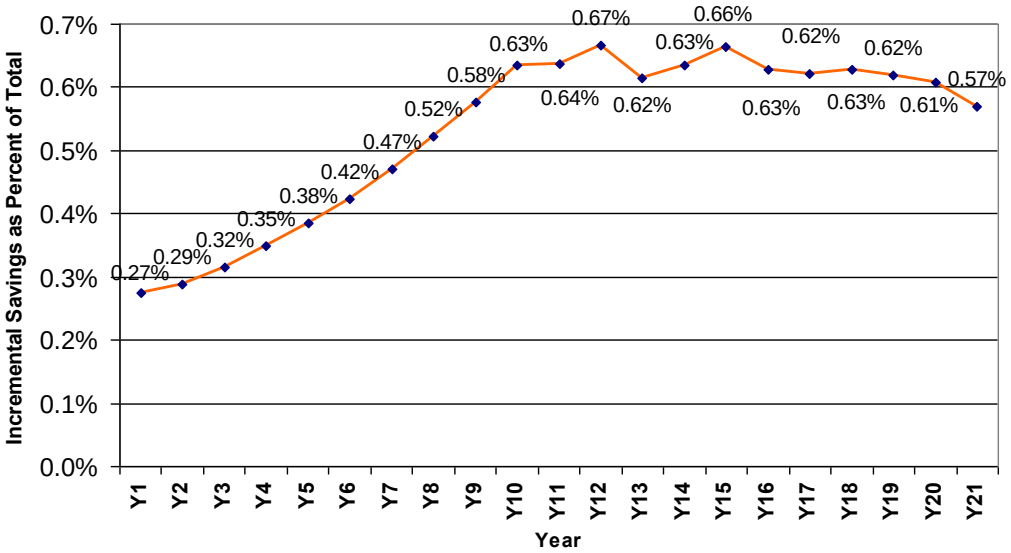
For purposes of setting energy efficiency goals, MRES and its members examined both the economic and the market potential results to estimate the amount of energy efficiency that can be realistically achieved in the given timeframe through DSM program interventions. Economic potential, as defined by PA Consulting, includes any measures that have the potential for energy efficiency that is technically achievable and also provides a positive return on investment for the consumer. Economic potential is conducted under an assumption that there are no barriers (infrastructure, market, measure performance) and evaluates only whether the net present value of the energy saved over the life of the measure is greater than the cost to implement the measure. The economic potential does not reflect cost-effectiveness for the utility.

Market potential, as defined by PA Consulting, refers to the maximum achievable potential for a set of consumers and assumes an aggressive portfolio of programs unconstrained by program costs, but still constrained by economic viability at the measure level. Market potential also accounts for actual, expected market barriers to measure adoption by end-users and incorporates explicit measure adoption assumptions over time. The Minnesota Deemed Savings Database was a key resource for many measure inputs, such as incremental costs and energy impacts. The inputs for the Potential Study were technology specific (e.g. kWh savings, incremental costs, equipment lifetime) and market specific (e.g. penetration and saturation). The inputs build upon each other throughout the stages of analysis, with the market potential incorporating the greatest number of inputs. MRES and its members were advised by PA Consulting that the market potential provides the most accurate guideline for energy efficiency potential that is both economically viable for the customer and cost-effective and realistic for the utility, taking into account market barriers, adoption rates, etc.

The Potential Study results for MRES Iowa members were as follows. Consumption in MWhs is based on 2007 EIA data.

INCREMENTAL MARKET POTENTIAL (10 YEAR)			
Municipal Utility	**2007 Sales (MWhs)**	**Incremental EE Potential-YR10 (MWhs)**	**Savings as Percent of Sales**
Alton Municipal Utilities	10,481	66	0.63%
Denison Municipal Utilities	151,755	956	0.63%
Hartley Municipal Utilities	18,821	119	0.63%
City of Hawarden Utilities	29,646	187	0.63%
Kimballton Municipal Utilities	2,449	15	0.61%
Lark Park Municipal Utilities	10,912	69	0.63%
Manilla Municipal Utilities	7,687	48	0.62%
Orange City Municipal Utilities	94,659	596	0.63%
Paullina Municipal Utilities	10,004	63	0.63%
Primghar Municipal Utilities	8,668	55	0.63%
Remsen Municipal Utilities	15,642	99	0.63%
Rock Rapids Municipal Utilities	28,348	179	0.63%
Sanborn Municipal Utilities	21,157	133	0.63%
Shelby Municipal Utilities	4,852	31	0.64%
Sioux Center Municipal Utilities	110,335	695	0.63%
Woodbine Light & Power	15,165	96	0.63%
Totals	**540,581**	**3,406**	**0.63%**

Incremental Savings as Percentage of Total – Market Potential



The results of the Potential Study show that the market potential for energy savings for the MRES Iowa members is .27 percent in the first year of the program (2010). The savings potential ramps up steadily for the first ten years of the program, reaching .63 percent savings in year ten. Savings results are then expected to level off and remain around the .63 percent level in years ten through 20 of the program.

Goal Setting by MRES Iowa Members

The Iowa members of MRES held three strategic planning sessions to review the results of the Potential Study, to discuss energy efficiency programs that would provide them with the greatest opportunity to achieve energy efficiency in their communities, to review cost/benefit analyses of energy efficiency measures, and to set energy efficiency goals for their communities. It was the consensus of the MRES Iowa members to set goals for energy efficiency in their communities at a level somewhat higher than the market potential indicated by the Potential Study. Several factors contributed to this decision:

- Efficiency programs are available to MRES members through BES
- MRES has offered to provide S-1 members in Iowa with monetary, program development, and implementation assistance
- MRES Iowa members believe they can overcome many of the identified market barriers through marketing campaigns and a trade ally outreach program
- MRES Iowa members want to challenge themselves to obtain the highest levels of energy efficiency possible
- Energy efficiency is a least-cost resource for MRES and its member utilities

Therefore, the MRES Iowa members have set forth the following goals to reduce electricity consumption in their respective service areas:

Annual IA Group Goals based on 3-Year Average Retail Sales (2005 - 2007 EIA Data)			
Year	**Goals**	**KWhs**	**MWhs**
2010	0.3% of average kWh sold	1,575,899	1,575.90
2011	0.5% of average kWh sold	2,626,498	2,626.50
2012	0.8% of average kWh sold	4,202,397	4,202.40
2013	0.9% of average kWh sold	4,727,697	4,727.70
2014	1.0% of average kWh sold	5,252,997	5,253.00

MRES Iowa Members Individual Goals	Annual Member Goals (MWhs)				
	2010	2011	2012	2013	2014
Alton Municipal Utilities	32.067	53.445	85.512	96.201	106.89
Denison Municipal Utilities	440.718	734.53	1175.248	1322.154	1469.06
Hartley Municipal Utilities	53.975	89.95833	143.9333	161.925	179.9167
City of Hawarden Utilities	86.4	144	230.4	259.2	288
Kimballton Municipal Utilities	6.945	11.575	18.52	20.835	23.15
Lark Park Municipal Utilities	32.946	54.91	87.856	98.838	109.82
Manilla Municipal Utilities	21.434	35.72333	57.15733	64.302	71.44667
Orange City Municipal Utilities	273.724	456.2067	729.9307	821.172	912.4133
Paullina Municipal Utilities	29.455	49.09167	78.54667	88.365	98.18333
Primghar Municipal Utilities	25.768	42.94667	68.71467	77.304	85.89333
Remsen Municipal Utilities	47.257	78.76167	126.0187	141.771	157.5233
Rock Rapids Municipal Utilities	85.182	141.97	227.152	255.546	283.94
Sanborn Municipal Utilities	61.838	103.0633	164.9013	185.514	206.1267
Shelby Municipal Utilities	14.457	24.095	38.552	43.371	48.19
Sioux Center Municipal Utilities	319.554	532.59	852.144	958.662	1065.18
Woodbine Light & Power	44.179	73.63167	117.8107	132.537	147.2633
Totals	**1575.899**	**2626.498**	**4202.397**	**4727.697**	**5252.997**

The kWh/MHh goals are based on the most recent three year average (2005-2007) retail sales from the Energy Information Administration (EIA) for the MRES Iowa members.

The reduction in energy consumption that will be used to determine whether the goal has been met will be the combined energy savings from each of the energy efficiency measures the MRES Iowa member utilities employ. The Iowa member utilities recognize that the potential to achieve the annual goals cannot be known with certainty and may need to be adjusted. In fact, the goals are higher than were identified by the Potential Study and therefore, may be difficult to achieve. Adjustments may also need to be made when significant changes in load occur. Furthermore, the utilities' success in reducing consumption will not occur evenly over time and results that exceed the goal in one year may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

For purposes of determining each utility's energy efficiency goal, sales to any electric customer using ten percent or more of the utility's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs. No customers have been excluded for the 2010-2012 reporting period.

Resolutions by Governing Bodies of MRES Iowa Members

Attachment A contains copies of the resolutions adopted by the governing bodies of all MRES Iowa Members.

Energy Efficiency Programs Developed to Meet Goals

MRES and its Iowa members have developed a portfolio of energy efficiency incentive programs designed to encourage the installation of high efficiency electrical equipment in commercial, industrial, and residential sectors. The programs have been branded BES. MRES Iowa members may choose to participate in some or all of the BES programs in order to meet their goals while tailoring the offering to their customer base. The following programs have been, or will be, developed for commercial and industrial (C&I) customers:

- Lighting Retrofit Program
- Lighting in New Construction Program
- Cooling/Chiller Program
- Motors/Pumps/VFD Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program – Schools and City Facilities
- New Construction Program
- Custom Rebate Program

For purposes of this report, all programs that use "deemed" or prescriptive savings will be combined under the category "Prescriptive Programs." Programs that require energy savings to be calculated on a case by case basis will be described separately.

The following programs have been, or will be, developed for residential customers:

- ENERGY STAR Products
- Residential Lighting Program
- Residential HVAC Program
- Appliance Turn-in Program
- New Construction Program

For purposes of this report, all programs that use "deemed" or prescriptive savings will be combined under the category "Prescriptive Programs." Programs that require energy savings to be calculated on a case by case basis will be described separately.

Program Descriptions

C&I Prescriptive Program

Program Concept and Description

The C&I Prescriptive Incentive Program provides prescriptive incentives to C&I primary and secondary customers for the installation of energy-efficiency (EE) equipment for numerous applications including lighting equipment, controls, heating, ventilation and air conditioning (HVAC) equipment, motors, refrigeration, and food service equipment. Prescriptive incentives are offered for a schedule of measures in each of these categories. Innovative energy efficiency measures or measures with large variability in application will be covered as part of the separate Custom Rebate Program. Application to existing facilities and/or new facilities will vary by measure depending on the codes and standards within new construction. New construction design assistance will be covered by the separate C&I New Construction Program.

The key to program success is two fold. The first is the engagement of the trade allies throughout the delivery channel that currently exists. These trade allies include manufacturers, distributors, consultants, engineers, and contractors. The program will have staff specifically dedicated to educating, partnering, and engaging these important players in the program. Through these existing trade allies who have relationships with C&I customers, the new high efficient technologies will be offered to customers as a viable option. To support the trade allies, the program also includes customer educational and promotional pieces designed to assist facility owners, operators and decision makers with the information necessary to improve the energy efficiency of the systems in their facilities.

The second key to success is utilizing the existing relationships of the MRES/members utility staff and customer service people who have relationships with customers and can help identify opportunities to participate in the program. These staff members will build customer awareness, educate the customer on opportunities, and connect interested customers with the appropriate participating contractors.

Program Objectives and Rationale

The primary goal of the program is to encourage the C&I customers of MRES members to install energy efficient measures in existing facilities. More specifically, the program is designed to:

- Provide incentives to facility owners and operators for the installation of high-efficiency equipment and controls.
- Provide the knowledge necessary and market demand to justify the marketing of high efficiency measures by electrical contractors, mechanical contractors, and their distributors.
- Overcome market barriers, including:
    - Lack of market supplier awareness, knowledge, demand, and trust of EE technologies.
    - Customers' lack of awareness and knowledge about the benefits and costs of energy efficiency improvements.
    - Performance uncertainty associated with energy efficiency projects.
    - Additional first costs for energy efficient measures.
- Ensure that the participation process is clear, easy to understand and simple.

Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information search costs, and technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the C&I market. The theory of the program is that through engagement and education with the market actors and through customer incentives to reduce first costs, the risks to energy efficiency will be reduced and the rewards from the savings will become more apparent thus increasing adoption.

The program is structured as a broadly applicable C&I prescriptive incentive program since the energy and demand savings for many common energy efficiency measures are similar across many C&I market segments. Having a simple program structure and incentive schedule provides customers and the market suppliers with certainty and ease of use regarding the incentives they will receive for installing a wide variety of EE measures.

Target Market and Eligibility Requirements

All non-residential customers of MRES members are eligible for the program. However, the main target markets are:

- Customers in both existing buildings and new construction, depending on the technology and code requirements. New construction design incentives are covered by the separate New Construction program.

Technology Categories

The C&I Prescriptive Programs is a customer incentive program for the installation of energy efficiency measures in non-residential facilities. More specifically, the program offers incentives for the following technology categories. Specific listings of technologies will change over time based on codes & standards, market need, introduction of new technologies and market adoption. The current detailed listing is in Attachment B.

- High efficiency lighting
- HVAC equipment
- Motors/Pumps/VFDs
- Refrigeration Equipment
- Food Service Equipment
- Controls
- Other specialty and miscellaneous equipment

Market Barriers

Market barriers vary by technology and customer segment. They include, but are not limited to:

- Lack of investment funds or high costs
- Competition for funds with other projects
- Lack of awareness/knowledge by both customers and contractors
- Lack of time
- Increased perceived risk from a newer technology in performance
- High transaction and information search costs

Working with the trade allies and providing incentives, MRES/members expect to reduce many of these barriers and stimulate installation of these measures.

Delivery Strategy and Administration

Designated MRES/member staff person(s) will provide program administration, marketing, vendor referrals, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. There will be specific staff assigned to work with the trade allies to promote the program and support the markets sales efforts. This trade ally work crosses over between the BES prescriptive programs and custom activities so that both are promoted to these key market actors. In addition, MRES/member account representatives will be expected to promote the program to their customers directly and cross promote other programs. Based on the ultimate size of the program and other issues, MRES/members may outsource portions of the program to an "implementation contractor."

Incentives

Incentives for each technology will vary based on cost effectiveness and market response. A full listing of the current proposed technologies and their incentives is attached in Attachment B. Additional guidelines may be established such as total incentives available per customer per year to assure that funds are allocated across all customer opportunities. Incentives will change over time as technologies and standards change and as the market responds to the program.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies, including the architecture/ engineering and contractor community, relevant professional and trade associations and other parties of interest in the market. An important part of the marketing plan will be the content and functionality of the BES website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars implemented in each market to provide details about how to participate in the Program. The seminars will be tailored to the needs of business owners, building managers, architects, engineers, vendors, and contractors;
- A combination of strategies including major media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key customers and customer representatives. Marketing activities will include but not be limited to:
    - o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through member mailings and will be available for various public awareness events (presentations, seminars etc).
    - o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can apply.
    - o Customer and trade ally outreach and presentations informing interested parties about the benefits of the program and how to participate.
    - o Print advertisements to promote the program placed in selected local media including the member area newspapers and trade publications.
    - o BES website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
    - o MRES/members customer account representatives trained to promote the program to their customers.

o MRES/members key account representatives informing their assigned accounts about the program during their regular communications.
o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
o Presentations by the program manager to key customers and customer groups to actively solicit their participation in the program.

• The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
• MRES/members will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program.

Education

Education and promotional materials will be developed for building owners and operators on the benefits of energy efficiency improvements and improved systems performance, including educational brochures, program promotional material, and website content. Specific educational and promotional efforts aimed at market actors such as electrical contractors, building supply firms, and distributors to help them promote efficient measures to their customers. This education will be through a combination of mailings and direct meetings with key market actors in the area.

Tracking and Evaluation Methodology

The incentive levels set for the custom measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the Total Resource Cost (TRC), Utility Cost (UCT), Ratepayer Impact Measure (RIM), Societal Test (ST) and Participant (PT) tests. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once all planned BES programs have been implemented. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review. Field inspections will be completed on five percent of all installations and 100 percent on installations over $10,000 in total incentives. Tracking will be through the MRES database.

Project Support/Resources

Energy savings calculations are based on Minnesota Deemed Savings Database algorithms developed by the MOES and other available information for measures not listed. Savings used in the DSMore calculations are listed in Attachment B.

Custom Rebate Program

Program Concept and Description

The C&I Custom Rebate Program provides a custom incentive to encourage the installation of high efficiency equipment or process improvements that are not covered by the Prescriptive Program. The Custom Rebate Program recognizes the value of both the energy and demand savings aspects of custom improvements and provides incentives based on both energy and demand savings. Recognizing energy savings, along with demand savings, will lead to the installation of measures that may not have high peak kW savings, but do have long term kWh savings. This program will pertain to existing facilities only.

Program Objectives and Rationale

The primary goal of the program is to encourage C&I customers of participating MRES members to install energy efficient process, refrigeration, and other energy efficient equipment & controls in existing facilities that save energy and demand beyond what they would have installed without the program. More specifically, the program is designed to:

- Stimulate the market and increase the number of energy savings projects.
- Provide incentives to facility owners and operators for the installation of high-efficiency process, refrigeration, controls and other custom process improvements.
- Provide a marketing mechanism for consulting engineers, process and equipment contractors, and distributors to promote energy efficient equipment to end users.
- Overcome market barriers, including:
    - o Customers' lack of awareness and knowledge about the benefits and cost of energy efficiency improvements.
    - o Performance uncertainty associated with energy efficiency projects.
    - o Additional first costs for energy efficient measures.
- Ensure that the participation process is clear, easy to understand and simple.

Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information search costs, and technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of custom measures that are not easily covered in a prescriptive program.

Target Market and Eligibility Requirements

All commercial and industrial retail customers of participating MRES members are eligible for the program. These Custom measures will focus on a variety of energy saving technologies, but will not include measures covered under the prescriptive program. All other cost effective electric energy improvements will be considered.

Technology Categories

The C&I Custom Program is a customer incentive program for the installation of energy efficiency measures in non-residential facilities. More specifically, the program offers incentives for any technology category that is not covered by the C&I Prescriptive Program, but that can be shown to save energy and demand. It is anticipated that custom projects will focus on customer-specific process equipment, technologies, and process improvements. Examples may include large refrigeration equipment and process changes and compressed air equipment and process

changes. Custom technologies will continually change based on codes and standards, market need, introduction of new technologies and market adoption.

Market Barriers

Market barriers vary by technology and customer segment. They include but are not limited to:

- Lack of investment funds or high costs
- Cost to analyze potential savings from a project through assessments/audits
- Competition for funds with other projects
- Lack of awareness/knowledge by customers, engineers, and contractors
- Lack of time
- Increased perceived risk from a newer technology in performance
- High transaction and information search costs

Working with the trade allies, increasing awareness and providing incentives, MRES and its members expect to reduce many of these barriers and stimulate installation of these measures.

Delivery Strategy and Administration

Designated MRES/member staff person(s) will provide program administration, marketing, vendor referrals, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. There will be specific staff assigned to work with the trade allies to promote the program and support the markets sales efforts. This trade ally work crosses over between the BES prescriptive programs and custom activities so that both are promoted to these key trade allies. In addition, MRES/member account representatives will be expected to promote the program to their customers directly and cross promote other programs. Based on the ultimate size of the program and other issues, MRES/members may outsource portions of the program to an "implementation contractor."

Incentives

The C&I Custom Rebate Program is a financial assistance and education program that provides incentives for the installation of energy efficiency measures that save energy and demand in existing non-residential facilities. These incentives will not be for measures covered under the Prescriptive Program. Customers/Contractors will submit an application for pre-approval before any purchase or installation of equipment is made. The application will include engineering calculations for energy and demand savings estimates. MRES/member staff or its subcontractor will review these projects and savings estimates and determine the validity of the project and the level of incentive that will be awarded. This review of the savings analysis helps assure that MRES/member funds are being cost effectively used to promote efficiency. The initial incentive levels are described in Attachment B.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the Custom Rebate Program and how they can participate in the program. Certain key customer segments will be targeted based on their qualifications in the targeted market segment, energy savings potential and technology. The strategy will also include outreach to key equipment partners and trade allies including consulting architects and engineering firms, process and refrigeration contractors and distributors, relevant professional and trade associations and other parties of interest in the market. An important part of the marketing plan will be the content and functionality of the BES website, which will direct

customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars implemented in each market targeted to provide details about how to participate in the Program. The seminars will be tailored to the needs of business owners, building managers, architects, engineers, vendors, and contractors;
- A combination of strategies including major media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key customers and customer representatives. Marketing activities will include:
    - o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the member utility and websites and will be available for various public awareness events (presentations, seminars etc).
    - o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can submit a proposal.
    - o Customer and trade ally outreach and presentations informing targeted parties about the benefits of the program and how to participate.
    - o Print advertisements to promote the program placed in selected local media including area newspapers and trade publications.
    - o BES website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
    - o MRES/member customer account representatives trained to promote the program to their customers.
    - o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
    - o Presentations by the program manager to key target market segment customers and customer groups to actively solicit their participation in the program.
- The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
- MRES/member will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program.

Education

Education and promotional materials will be developed for C&I Customers, including educational brochures, program promotional material, and website content. Specific educational and promotional efforts aimed at market actors such as electrical contractors, building supply firms, and distributors to help them promote the program to their customers. This education will be through a combination of mailings and direct meetings with key trade allies in the area.

Tracking and Evaluation Methodology

The incentive levels set for the custom measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once all planned BES programs have been implemented. They will include both impact and process evaluation efforts. For verification, all incentive

applications will have a paper and calculation review. Field inspections will be completed on 100 percent of Custom projects. Tracking will be through the MRES database.

Project Support/Resources

Energy and demand savings estimates under the Custom Program are based on the Minnesota Deemed Savings Database algorithms and other available information. Savings used in the DSMore calculations are listed in Attachment B. For the Custom Program, the actual reported savings for each project will be based on engineering calculations and those calculations will be reviewed by a trained professional to assure that assumptions are appropriate. Pre-approval will occur prior to installation. The calculations will be updated and reviewed again after final inspection of the project to ensure accuracy. If necessary the calculations will be run through the DSMore model to assure cost-effectiveness.

Note: Custom and New Construction C&I were all modeled as one program as incentives are the same.

C&I New Construction Program

Program Concept and Description

The C&I New Construction Program provides design assistance and custom incentives to C&I customers for building more efficient new buildings and installing energy-efficiency equipment and controls that are not required by building energy codes and are above standard construction practices. This program will pertain to new buildings and major remodeling projects only. There will be two components to the program. (1) Incentives are offered for standard efficiency technologies that are upgraded beyond code or standard practices, such as standard lighting and HVAC measures. These incentives will be provided under separate BES programs. (2) Incentives are offered for design assistance and the upgrade of the whole building. Incentives will be based on the percent improvement above the local building code or above the ASHRAE 90.1 standards as determined by DOE 2 or equivalent building simulation modeling.

The program includes customer educational and promotional pieces designed to assist facility owners, operators, and decision makers with the information necessary to improve the energy efficiency of the lighting, HVAC, building envelope, refrigeration, and other energy using systems in their new facilities. The program also includes customer and trade ally education to assist with understanding the technologies that are being promoted, the incentives that are offered, and how the program functions.

Program Objectives and Rationale

The primary goal of the program is to encourage C&I customers of participating MRES members to build more efficient new buildings and to install energy efficient lighting, HVAC, building envelope, refrigeration, and control measures in new buildings. More specifically, the program is designed to:

- Provide design assistance to the architects and engineers that are designing new buildings. The key design assistance tool is building simulation modeling of more efficient building designs.
- Provide incentives to new facility owners for the installation of high-efficiency lighting, HVAC, building envelope, refrigeration and other equipment and controls. Incentives for the installation of high efficiency equipment will be covered through the applicable Bright Energy Solutions prescriptive programs when no modeling is completed. When modeling is completed that equipment will be considered within the total savings percent and provided the incentives as a total package.
- Provide a marketing mechanism for architects and engineers to promote energy efficient new buildings and equipment to end users.
- Overcome market barriers, including:
    - Customers' lack of awareness and knowledge about the benefits and costs of energy efficiency improvements.
    - Performance uncertainty associated with energy efficiency projects.
    - Additional first costs for energy efficient measures.
    - Lack of time, resources, and motivation by the designer/engineer to consider efficient alternatives and model these results for the owner's consideration.
- Ensure that the participation process is clear, easy to understand and simple.

Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information search costs, and technology performance uncertainties. If the building is not designed and constructed with electric efficiency in mind, there might not be the opportunity to make these

improvements until many years later when the equipment fails or further building remodeling occurs. Taking advantage of this opportunity at the time of design and construction allows energy efficiency to be optimized and is usually less costly than equipment replacement or redesign. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the new construction C&I market.

The program is targeted towards larger C&I new construction facilities. Customer incentives are calculated on a custom $/kW and $/kWh basis, since the energy and demand savings for many common energy efficiency measures vary considerably between customers. Having a simple program and incentive structure provides customers with ease of use regarding the financial rewards they will receive for installing a wide variety of efficiency measures.

Target Market and Eligibility Requirements

All commercial and industrial retail customers of participating MRES members that are building new facilities or extensively remodeling existing facilities are eligible for the program. However, the main target markets are:

- Larger new commercial and institutional customers of MRES member utilities.
- Primary target markets are expected to be office buildings, educational buildings, and health care facilities. Other building types are eligible to participate as well.

Technology Categories

The technologies to be included within this program are flexible and include all that will save electrical energy and demand. Participants can choose to use the incentives offered in the existing BES prescriptive programs without going through the design modeling process. These technologies applicable to new construction will be processed through normal BES incentive application forms. For those who are willing to complete design modeling comparisons, any additional electrical improvements will be included.

Market Barriers

Market barriers vary by technology and customer segment. They include but are not limited to:

- Lack of investment funds or high costs
- Competition for funds with other projects
- Lack of awareness/knowledge by both customers and architects/engineers
- Lack of time and resources during the design process
- Increased perceived risk from a newer technology in performance
- High transaction and information search costs

Working with the building owners and the architects/engineers and providing incentives, MRES and its members expect to reduce many of these barriers and stimulate installation of these measures.

Delivery Strategy and Administration

The C&I New Construction Program is a customer incentive program that provides design assistance for architects and engineers designing new buildings and customer incentives for the installation of energy efficiency measures in new C&I facilities. More specifically, the program offers the following products and services:

• Education and promotional materials aimed at building owners and operators about the benefits of energy efficiency improvements and improved systems performance, including educational brochures, program promotional material, and website content.
• Educational and promotional efforts aimed at architect and engineers to help them promote efficiency measures to their customers through workshops and direct visits.
* Incentives for building owners and managers to adopt the measures recommended by the program.
* Incentives for design modeling to consider energy efficiency in the building and building systems. When appropriate the program will help with Leadership in Energy and Environmental Design (LEED) certification requirements.
* Energy efficiency measures that will be covered by the program include:
  o Efficient lighting systems and controls.
  o Efficient HVAC and controls systems, including energy management systems.
  o Efficient motors, pumps, and variable speed drives.
  o Building envelope measures such as insulation and efficient windows.
  o Efficient electric water heating measures.
  o Efficient refrigeration systems.

To deliver these services, MRES will hire or subcontract with energy efficiency design and engineering experts to talk with the community of architects and engineers about the program and educate them on its benefits. These experts will also provide technical assistance to the designers concerning the building simulation modeling of the high efficient alternatives. In addition, designated MRES or member staff person(s) (or a subcontractor) will provide program administration, marketing, vendor referrals, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. To help promote the program to building owners MRES/member account representatives will promote the program during their normal contacts.

Incentives

The incentives for the program can come through two different options. The first option is a prescriptive incentive for technologies above code that are within the Prescriptive Program listing. This situation will be used if the building simulation modeling is not used. These technologies will receive incentives at the same levels as the prescriptive program. This keeps the communications with the trade allies and suppliers clear and makes processing easy. To get architects and engineers to model and encourage efficiency in their buildings, incentives will be provided for the initial design comparisons and building simulation modeling. Incentives will also be available for the building owner to install the high efficiency equipment. These installation incentives will likely be based on three levels of performance above local building code or ASHRAE 90.1 standards; 10-20 percent above baseline code, 20-30 percent above code and 30 percent or more and will change over the program life as the market responds.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including architects and engineering firms, contractors and distributors, relevant professional and trade associations and other parties of interest in the market. An important part of the marketing plan will be content and functionality on the BES website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

• Education seminars implemented in each market to provide details about how to participate in the Program. The seminars will be tailored to the needs of business owners, building managers, architects, engineers, vendors, and contractors;
• A combination of strategies including major media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key customers and customer representatives. Marketing activities will include:

o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the member utility and the website. They will also be available through various public awareness events (presentations, seminars etc).
o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can apply.
o Customer and trade ally outreach and presentations (e.g. Building Owners and Managers Association (BOMA) and other customer organizations) informing interested parties about the benefits of the program and how to participate.
o Print advertisements to promote the program placed in selected local media including the member area newspapers and trade publications.
o MRES/member website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
o Member customer account representatives trained to promote the program to their customers.
o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
o Presentations by the program manager to key customers and customer groups to actively solicit their participation in the program.

• The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
• MRES/members will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program.

Education

Education and promotional materials will be developed for building owners, architects, engineers, and operators on the benefits of energy efficiency improvements and improved systems performance, including educational brochures, program promotional material, and website content. Specific educational and promotional efforts aimed at architects and engineers will be provided to help them promote energy efficient measures to their customers. This education will be through a combination of mailings, workshops, and direct meetings with key trade allies in the area.

Coordination with Trade Allies

A key aspect of success with this program will be through coordination with the market channels (trade allies) - contractors, developers, engineers and architects. There will be special emphasis and resources assigned to work with architects and engineers to overcome their barriers.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT.

The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once all planned BES programs have been implemented. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review. Field inspections will be completed on 100 percent of C&I New Construction projects. Tracking will be through the MRES database.

Project Support/Resources

Energy Savings are based on MOES Database algorithms and other available information. Savings used in the DSMore calculations are listed in the Attachment B. For the New Construction program, each project will have savings based on the DOE 2 simulations reviewed by a trained professional to assure that assumptions are appropriate and approval will occur prior to construction. If necessary the calculations will be run through the DSMore model to assure the cost effectiveness.

Note: Custom and New Construction C&I were all modeled as one program as incentives are the same.

Targeted Audit Program – Schools and City Buildings

Program Concept and Description

The Targeted Audit Program is a program that provides funding or grants to schools and cities for targeted assessments/studies of energy efficiency potential within existing buildings. These studies will be funded at 50 percent of the cost of the study. They will be based on a comprehensive analysis of all the systems, or individual systems, within the facilities. If the cost-effective recommendations (those with a two year payback or less) are implemented within two years of the study, the balance of the study costs will be refunded by MRES/members as well. The program also provides incentives for the identified energy efficiency improvements through existing custom and prescriptive incentive programs for the installation of energy efficient equipment and controls.

Program Objectives and Rationale

The objective of the C&I Targeted Energy Audit Program is to encourage the installation of energy efficient equipment and controls in schools and city building. As a first step to help identify appropriate improvements for the school facility, the program will provide a cost-shared targeted energy audit. A team of energy engineers designated by MRES will work with school districts, city government officials, and trade allies to identify facilities that meet the criteria to receive a targeted energy audit. Eligible measures identified during the energy audit will receive financial incentives based on prescriptive or custom program rules as a means for improving the project's return on investment and therefore chances for implementation.

Target Customer Market

MRES/Member staff, along with the designated engineering team will market energy audits to school districts and city governments served by MRES participating members. Eligible facilities include elementary, secondary, high schools and private schools, along with universities and technical schools. Also eligible are city-owned facilities, such as municipal buildings, utility buildings, water, and wastewater treatment plants. Other commercial customer segments may be considered for eligibility in future years of the program.

Market Barriers

Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information search costs, and technology performance uncertainties. Schools have additional barriers of lack of resources to assess opportunities and limited capital budgets.

This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures by sharing the initial cost of the energy audit with the school or city. Eligible participants will receive 50 percent off the cost of the energy audit up to $5,000 per building, for facilities that qualify with an ENERGY STAR benchmark score less than 75.

A lower score indicates a less efficient facility and therefore the likelihood of solid energy saving opportunities. Payment of the audit fee will be required prior to performance of the audit.

The participating customer is eligible for reimbursement of the remaining cost of the audit upon completion of all recommended measures that have a simple payback of two years or less, within 24 months of the completed audit. This incentive is provided to lower the initial information

acquisition costs and provide resources to adequately assess the facility. Once the audit has been performed, custom or prescribed incentives are provided according to the rules of those programs for eligible projects in order to further remove financial barriers to completing the project.

The energy engineers designated by MRES will work with customer staff, member service managers, and trade allies to perform the energy audit and subsequently inform the customer of energy saving opportunities that were identified as a result of the energy audit. The targeted audit identify and quantify proposed energy saving measures, determine potential kW and first year kWh savings, determine opportunities for incentives under the BES Prescriptive and/or Custom Programs, and calculate a simple payback for each measure.

Savings Assumptions

There are no savings directly attributable to performing an energy audit. Savings will be calculated for each energy savings measure installed as a result of the energy audit under the guidelines of the appropriate program.

Eligible Measures/Technologies and Incentive Strategy

Energy audits will identify opportunities for improved energy efficiency and recommend measures to address those opportunities. Energy audits will provide recommendations for projects that can produce verifiable demand and energy savings. Examples of eligible projects include both custom measures where kW and kWh savings can be calculated and peer verified, and prescriptive measures.

Incentives

Incentives for Energy Audits initially cover 50 percent of the cost of the audit. The incentive increases to cover the rest of the cost of the audit if the school district performs 100 percent of the recommended measures that have a simple payback of two years or less, within 24 months of the completed audit.

Marketing Strategy

The Program will be marketed to schools and city governments directly and also to trade allies. MRES and member utility staff will raise awareness of the offering through direct outreach to school boards and city personnel. MRES and member utility staff will promote the program through ongoing training/education sessions to recruit new wholesalers, and in turn retail contractors, to promote the offerings. The MRES designated engineer will also promote the offerings to professionals through local associations (e.g. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Association of Energy Engineers (AEE) at meeting events.

Program Implementation

MRES/member staff will administer, market, process incentives, and coordinate awareness/education and training activities. A team of energy engineers, designated by MRES, will perform all energy audits. The engineers will be responsible for working directly with customer, allies, professionals, and member service managers to understand and communicate the prospective energy saving projects, document the potential kW and first year kWh savings, confirm eligibility with program rules, and make the incentive offer. The engineer will be responsible to complete quality control site visits for select number of projects, answer questions, trouble shoot program challenges, etc.

As an initial qualifier, interested school customers will be asked to complete a brief application form containing information about the facility's size, age, and electric and gas consumption and costs. The designated energy engineer will use that information to complete an ENERGY STAR benchmark score to determine the customer's relative efficiency as the facility currently operates. If the customer has an ENERGY STAR score less than 75 and/or the customer's energy intensity is greater than the corresponding energy intensity for their facility type, the facility could be considered as a candidate for an energy audit.

The national energy performance rating, or ENERGY STAR score, developed by the Environmental Protection Agency (EPA) measures how efficiently a building uses energy relative to similar buildings nationwide. Statistically representative models are used to compare a building's energy performance against similar buildings based on Commercial Buildings Energy Consumption Survey (CBECS) data. The ENERGY STAR score is a rating system using a scale of 1 - 100. A score of 50 implies average energy performance, while a rating of 75 or better implies top performance. Buildings that earn a rating of 75 or more may qualify for the ENERGY STAR label. Based on the EPA's qualification of a building to receive the ENERGY STAR label, it is recommended that all buildings with a score of less than 75 are considered as candidates for energy audits. Not all building types are eligible to receive an ENERGY STAR rating.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once all planned BES programs have been implemented. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review. Field inspections will be completed on five to ten percent of projects that have incentives under $10,000, and 100 percent of projects that have incentives over $10,000. Tracking will be through the MRES database.

ENERGY STAR® Products Program

Program Concept and Description

The ENERGY STAR Products program provides market incentives and market support through retailers to build market share and usage of ENERGY STAR products. Special incentives to buyers, distributors and/or manufacturers and in-store support stimulate demand for the products and make it easier for store participation. The program targets both small Commercial & Residential customers' purchase of specified technologies through market channels, retail stores, and special sales events. The measures to be included will vary over time as new ENERGY STAR products are developed or existing products become widely adopted and no longer need incentives to encourage purchase.

The program includes customer educational and promotional pieces designed to assist residential and small commercial customers with the information necessary to improve the energy efficiency of their entire home or property. The program also includes customer and retailer education to assist with understanding the technologies and applications that are being promoted, the incentives that are offered, and how the program functions.

Program Objectives

The primary objective of the program is to increase the adoption of high efficiency ENERGY STAR products through retail markets. The theory is that through market support of retailers, these products will have more exposure to customers and better placement in the store. The sales force will also be more aware of the product and promote it more often. Customers will then try the product and increase use of these products. It is expected that as the product gets more widely accepted and prices are reduced, that MRES and its participating members can reduce or drop the incentives and the measures will be commonly adopted by consumers.

The program is designed to:

- Provide retail or distribution/manufacturer incentives to residential customers for the installation of measures to reduce energy use in the home and information about other programs that encourage the installation of high-efficiency equipment, such as lighting, heating, and cooling systems and appliances.
- Provide a marketing mechanism for retailer and high efficiency product suppliers to promote energy efficient equipment and products to end users.
- Overcome market barriers, such as:
    - Customers' lack of awareness and knowledge about the benefits and costs and comfort of higher efficient equipment, products, and appliances.
    - Performance uncertainty associated with energy efficiency weatherization projects.
    - Additional costs for efficiency improvements.
- Ensure that the participation process is clear, easy to understand and simple for the customer and contractor.

Program Rationale

Certain barriers exist to the adoption of energy efficiency products, including lack of financial resources, competition for funds with other household budget items, lack of awareness/ knowledge about the benefits and costs of energy efficiency measures, difficulty of finding retailers who carry the products, lack of knowledge by retail staff and energy saving performance uncertainties. This program is designed to help overcome these market barriers and encourage

greater adoption of Energy Star qualified products used in the residential and small commercial markets.

In addition to helping customers reduce and manage their energy costs, this program provides other societal and customer benefits. These can include a more comfortable home, greater satisfaction with their energy purchase, reduced greenhouse gas emissions, and lower overall long-term rates and energy costs compared to other resource options. Having a simple program structure and rebate schedule provides customers with certainty and ease of use regarding the incentives they will receive for installing a wide variety of energy efficiency products and measures.

Target Market and Eligibility Requirements

All residential and small commercial customers of participating MRES members who purchase ENERGY STAR products through retail stores are eligible for the program. All retail stores that carry or could carry ENERGY STAR products throughout the MRES/member territories are eligible to participate in the program.

Technology Categories

The first year of the program will focus on ENERGY STAR qualified compact fluorescent lamps (bulbs), room air conditioners, clothes washers, dishwashers, dehumidifiers, Light-emitting Diode (LED) holiday lights. The ENERGY STAR technologies will be evaluated on an annual basis and will change over time based on codes and standards, market need, introduction of new technologies and market adoption.

Market Barriers

There are several barriers addressed through the program. The first is price. Purchase incentives are provided for customers to lower the initial cost of the item and stimulate interest. Another alternative to retail purchase incentives that will be utilized on some products in the program are distributor/manufacturer "buy down" incentives to lower the purchase price of the product.

The second barrier is retailer participation. Through retail education, in-field sales support (signs, ads, etc), and stimulated market demand, retailers will stock more product, provide special promotions and plan sales strategies around these ENERGY STAR products. Additional support is provided through manufacturer relationships that often can reduce prices through special large-scale purchases. Coordination will occur with the national ENERGY STAR initiatives such as the "Change a Light, Change the World" promotion.

Delivery Strategy and Administration

Designated MRES/member staff person(s), and/or a subcontractor, will provide program administration, marketing, retailer relationships, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. Delivery of the program will be through a MRES/member staff and/or subcontractor who will work with the trade allies and retailers. They will build and support the retailer network and provide marketing and training.

Incentives

Incentives will be available in two ways; through mail-in forms available from the utility and the retailer and through special in-store "Instant Reward" events that occur in-store at the time of purchase. Initial proposed incentive levels for ENERGY STAR products are:

- CFL's = $1.50 per bulb
- Clothes Washers = $50/unit
- Dehumidifiers = $10/unit
- Dishwashers = $25/unit
- Room AC = $15/unit
- LED Holiday Lights = $3.50/strand of 25 or more

Incentives may change based on market prices and customer response, as well as manufacturer/ distributor co-funding.

A second incentive alternative will be used when appropriate. Manufacturer or distributor "buy down" incentives directly to the manufacturer or distributor before delivery to the retailer will also be used to reduce the end price to the customer.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including the retailer community, relevant trade associations, and other parties of interest in the market. An important part of the marketing plan will be content and functionality on the MRES/member website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

Education/support for Retailer and Training

A combination of strategies will be used, including media advertising, outreach community forums and events, and direct outreach to customers and retailers.

Marketing activities will include:

o Brochures that describe the benefits and features of the program including program application forms and processes. The brochures will be available for various public awareness events (presentations, seminars etc).

o Bill inserts, bill messages, and email messages.

o BES website content providing program information resources, contact information, downloadable application forms, and links to other relevant service and information resources.

o Member customer representatives trained to promote the program to their customers.

o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.

o Presentations by the member or program coordinator to key retailers and supplier groups to actively solicit their participation in the program.

o The marketing strategy will identify key retailers groups for target marketing, and will prepare specific outreach activities for them.

Market Support/Coordination with Trade Allies

The key to this program that is different from past utility rebate programs is market support. In-field support will provide materials, training, and label product to retailers. This in-field support eliminates many of the barriers that retailers have to promoting this program. Another aspect of the market support is coordination with manufacturers on a national level. Working with the national and regional ENERGY STAR efforts, MRES and its participating members will be able to leverage quantities and reduce prices in the marketplace.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once all planned BES programs have been implemented. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review. Field inspections will be completed on five percent of all installations. Tracking will be through the MRES database.

Project Support/Resources

Energy savings calculations are based on Minnesota Deemed Savings Database algorithms developed by the MOES and other available information for measures not listed. Savings used in the DSMore calculations are listed in Attachment B.

Appliance Turn-In Program

Program Concept and Description

Older vintage room air conditioners, refrigerators, freezers, and dehumidifiers can be some of the least efficient electrical appliances in the home. Often these old units are used when they are not functioning properly and as a result, they use electricity very inefficiently. The Appliance Turn-In Program encourages customers to dispose of their old, under-utilized appliances and/or to purchase new ENERGY STAR qualified equipment. During special promotions, participants would be provided with incentives to have their old, inefficient equipment picked up. Units received will be properly recycled through a certified recycling agency. From time to time, customers may also receive coupons towards more efficient appliances if they turn in an old unit or arrange to have the old unit picked up.

The program includes customer educational and promotional pieces designed to assist residential customers with the information necessary to improve the energy efficiency of their entire home. The program also includes customer and trade ally education to assist with understanding the technologies and applications that are being promoted, the incentives that are offered, and how the program functions.

Program Objectives

The primary objective of the program is to get improperly operating, inefficient appliances off the grid and recycled so that they don't go into the secondary used appliance market. The secondary purpose is to raise awareness of efficient ENERGY STAR appliances and how much these efficient units can save customers.

The program is designed to:

- Provide incentives to home owners for the removal of old, inefficient equipment.
- Provide incentives to home owners for the installation of measures to reduce energy use in the home and information about other programs that encourage the installation of high-efficiency equipment, such as lighting, heating, and cooling systems and appliances.
- Provide a marketing mechanism for customer and retail stores to promote energy efficient equipment to end users.
- Overcome market barriers, including:
    - o Customers' lack of awareness and knowledge about the benefits and costs and comfort of higher efficient equipment, products and appliances.
    - o Customer's lack of awareness and knowledge about the cost of operating inefficient equipment.
    - o Customer's lack of awareness and knowledge about how to properly dispose of and recycle old appliances
    - o Additional costs for efficiency improvements.
- Ensure that the participation process is clear, easy to understand and simple for the customer and contractor.

Program Rationale

Certain barriers exist to the adoption of energy efficiency appliance turn-in, including lack of financial resources to purchase new equipment, inability to deliver the old appliance to the drop-off location, competition for funds with other household budget items and lack of awareness/knowledge about the benefits and costs of energy efficiency measures. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency objectives of turned in appliances in the residential market. Having a simple program

structure and rebate schedule provides customers with certainty and ease of use regarding the incentives they will receive for turning in appliances.

Target Market and Eligibility Requirements

All residential customers of MRES participating members are eligible for the program. However, the main target markets are:

- Customers with working second and third refrigerators and freezers, and inefficient room air conditioners.

Technology Categories

1) Room air conditioners that the participant can bring to a drop off point
2) Refrigerators and freezers that can be picked up

Market Barriers

Older room AC units often are inefficient and ineffective without the user realizing it. The fan may continue to run while the compressor is not functioning properly. The customer's lack of knowledge causes a barrier and lack of stimulation to change out that unit. This program provides both the education and incentive to remove and replace the inefficient unit.

To overcome these market barriers, the program offers the following products and services:

- Education and promotional materials aimed at residential customers, contractors and retailers about the benefits of energy efficiency improvements that can be achieved with turned in appliances.
- Educational and promotional efforts aimed at trade allies, such as retailers.
* Rebates for residential customers to encourage the adoption of the program.

Delivery Organizations

A competitive bid process will be used to select a subcontractor to implement the program. Local recyclers may also be permitted to participate in the program if they can provide certification of proper recycling.

Incentives

Incentives will be provided for the following measures.

- Room AC = $25 pick up or drop off incentive
- Refrigerator = $35 pick up incentive
- Freezer = $35 pick up incentive

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including the retail community, relevant trade associations, and other parties of interest in the market. An important part of the marketing plan will be content and functionality of the BES website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

• Support for contractor recruitment and retailer training;
• A combination of strategies including media advertising and outreach community forums and events, and through direct outreach to customers and contractors. Marketing activities will include:

- o Brochures that describe the benefits and features of the program including program application forms and processes. The brochures will be available for various public awareness events (presentations, seminars etc).
- o Targeted direct mailings used to educate customers on the benefits of the program and explaining how they can participate.
- o Bill inserts, bill messages and email messages.
- o BES website content providing program information resources, contact information, downloadable application forms, and links to other relevant service and information resources.
- o Member customer representatives trained to promote the program to their customers.
- o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
- o Presentations by the program manager to key contractor and retailer groups to actively solicit their participation in the program.

• The marketing strategy will identify key customer groups for target marketing, and will prepare specific outreach activities for these customers.

Coordination with Trade Allies

The primary trade ally supporting this program will be a subcontractor chosen to provide appliance pick-up and recycling services throughout the MRES/member service areas. There will also be coordination efforts with local appliance retailers, as well as with local city and/or county recycling centers.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT tests. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once final programs are approved. They will include both impact and process evaluation efforts. For verification all units will be tested to see if they are operational prior to accepting the unit and providing the incentive. Tracking will be through the contractor and MRES database.

Project Support/Resources

Energy Savings are based on MOES Database algorithms and other available information for measures not listed. Savings used in the DSMore calculations are listed in the Attachment B.

Residential New Construction Program

Program Concept and Description

The Residential New Construction Program provides incentives to Residential customers for building more efficient new homes and installing energy-efficiency equipment and insulation levels to meet ENERGY STAR and/or MN GreenStar building requirements. This program will pertain to new electrically heated homes only. Incentives will be provided to the home builder based on meeting the ENERGY STAR and/or MN GreenStar certification requirements.

The program includes customer educational and promotional pieces designed to assist builders and homeowners with the information necessary to improve the energy efficiency of the new home and the requirements of the ENERGY STAR and/or MN GreenStar program.

Program Objectives and Rationale

The primary goal of the program is to encourage residential customers of participating MRES members to build more efficient new homes and to install energy efficient lighting, heating and cooling equipment, and improve building envelope efficiency in new homes. More specifically, the program is designed to:

- Provide incentives to meet the national ENERGY STAR and/or MN GreenStar requirements. Those can be on a performance basis or a builder equivalence basis for the State of Iowa.
- Provide technical information, education, and training to builders so that they can understand and comply with the standard.
- Provide connections between the home energy rating system (HERS) raters and professionals and area builders or homeowners.
- Provide a marketing mechanism for builders to promote ENERGY STAR and/or MN GreenStar rated new homes.
- Overcome market barriers, including:
    - Customers' lack of awareness and knowledge about the benefits and costs of energy efficiency improvements.
    - Performance uncertainty associated with energy efficiency projects.
    - Additional first costs for energy efficient measures.
    - Lack of time, resources, and motivation by the builder to consider efficient alternatives.
- Ensure that the participation process is clear, easy to understand and simple.

Certain barriers exist to the adoption of energy efficiency measures, including lack of investment capital, competition for funds with other home investments or amenities, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, lack of education and skills of the builder, and technology performance uncertainties. If the home is not designed and constructed with electric efficiency in mind, there might not be the opportunity to make these improvements until many years later when the equipment fails or further building remodeling occurs. Taking advantage of this opportunity at the time of design and construction allows energy efficiency to be optimized and is usually less costly than equipment replacement or redesign. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the new construction residential market.

Target Market and Eligibility Requirements

All residential customers of participating MRES members that are building new electrically heated homes are eligible for the program. However, the main target markets are:

- Primary target market is the custom and production builders and developers of new homes.

Technology Categories

The technologies to be included within this program are the whole house building shell, heating and cooling equipment, lighting, appliances and other standards required to meet the ENERGY STAR and/or MN GreenStar certification guidelines.

Market Barriers

Market barriers vary by technology and customer segment. They include, but are not limited to:

- Lack of investment funds or high costs
- Competition for funds with other home amenities at the time of construction
- Lack of awareness/knowledge by both customers and builders
- Lack of time and resources by the builder to learn the requirements for ENERGY STAR and/or MN GreenStar
- Increased perceived risk from a newer technology in performance

Working with the homeowners and builders and providing incentives, MRES and its members expect to reduce many of these barriers, stimulate installation of these measures, and improve overall home construction.

Delivery Strategy and Administration

The Residential New Construction Program is a homeowner and builder/developer incentive program that provides assistance for builders designing new ENERGY STAR and/or MN GreenStar homes and homeowner/builder incentives for the installation of energy efficiency measures in new residential homes. To deliver these services, MRES/member will hire or subcontract with HERS home experts to talk with the builder community about the program and educate them on its benefits. These experts will also provide technical assistance to the builders concerning the ENERGY STAR and/or MN GreenStar modeling and construction practices. In addition, designated MRES/member staff person(s) will provide program administration, marketing, vendor referrals, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. To help promote the program to building owners, member account representatives will promote the program during their normal contacts.

MRES/members will also provide a listing of area certified HERS raters to perform the inspections and assure compliance with the ENERGY STAR and/or MN GreenStar standards. These experts work with the builders to educate, inspect, and certify that the home meets the required standards.

Incentives

The incentives for the program will be provided once the home is certified as ENERGY STAR and/or MN GreenStar compliant. They will be provided to the homeowner or builder/developer of the home. Electrically heated homes qualify for the incentive. In new homes that are gas heated, incentives are provided on a per measure basis through other programs. The initial incentive levels are described in Attachment B.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform homeowners, builders and developers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including builders, developers, architects, contractors, equipment distributors, trade associations, and other parties of interest in the market. An important part of the marketing plan will be the content and functionality of the BES website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars implemented in each market to provide details about how to participate in the Program. The seminars will be tailored to the needs of homeowners, builders, developers and architects;
- A combination of strategies including local media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key builders and developers depending on the area. Marketing activities will include:
    - o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the member utility and the website. They will also be available through various public awareness events (presentations, home shows etc).
    - o Targeted direct mailings used to educate homeowners of the benefits of the program and explaining how they can apply.
    - o Customer and trade partner outreach and presentations (e.g. Home Builders Association (HBA) and other builder organizations) informing interested parties about the benefits of the program and how to participate.
    - o Print advertisements to promote the program placed in selected local media including the member area newspapers and trade publications.
    - o BES website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
    - o Member customer account representatives trained to promote the program to their customers.
    - o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
    - o Presentations by the program manager to key customers and customer groups to actively solicit their participation in the program.
- The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
- MRES/member will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program.

Education

Education and promotional materials will be developed for home owners and developers on the benefits of ENERGY STAR and/or MN GreenStar homes and improved systems performance, including educational brochures, program promotional material, and website content. Specific educational and promotional efforts will be provided to help them promote energy efficient measures to the homeowners/buyers. This education will be through a combination of mailings, workshops, and direct meetings with key market actors in the area.

Coordination with Trade Allies

A key aspect of success with this program will be through coordination with the market channels (trade allies) - contractors, developers, engineers, and architects. There will be special emphasis and resources assigned to work with builders to overcome their barriers.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT tests. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once final programs are approved. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review of the plans. Field inspections will be completed on five percent of all installations. Tracking will be through the MRES database.

Project Support/Resources

Energy Savings are based on MOES Database algorithms and other available information for measures not listed. Savings used in the DSMore calculations are listed in the Attachment B.

Residential HVAC Program

Program Concept and Description

The Residential HVAC Program provides incentives to residential customers for installing energy-efficient heating and cooling equipment. This program will pertain to existing homes installing new equipment and to new homes only when they are not getting the Residential New Construction Program incentives. Incentives will be provided to the home owner and based on meeting the efficiency requirements.

The program includes customer educational and promotional pieces designed to assist builders, contractors, and homeowners with the information necessary to choose the high efficiency alternative for the HVAC qualifying equipment.

Program Objectives and Rationale

The primary goal of the program is to encourage residential customers of participating MRES members to install energy efficient heating and cooling equipment. More specifically, the program is designed to:

- Provide incentives to purchase high efficiency equipment as specified within the program.
- Provide technical information, education, and training to contractors, builders, and homeowners so that they can understand the benefits of the high efficiency alternatives.
- Provide connections between the HERS raters and professionals and area builders or homeowners.
- Provide a marketing mechanism for contractors and equipment distributors to promote high efficiency equipment.
- Overcome market barriers, including:
    - Customers' and contractors' lack of awareness and knowledge about the benefits and costs of energy efficiency equipment.
    - Performance uncertainty associated with energy efficiency equipment.
    - Additional first costs for energy efficient equipment.
    - Lack of time, resources, and motivation by the contractor and homeowner to consider efficient alternatives.
- Ensure that the participation process is clear, easy to understand and simple.

Certain barriers exist to the adoption of energy efficiency equipment, including lack of investment capital, competition for funds with other home investments or amenities, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, lack of education and skills of the contractor, and technology performance uncertainties. If the equipment is replaced without electric efficiency in mind, there might not be the opportunity to make these improvements until many years later when the equipment fails. Taking advantage of this opportunity at the time of replacement allows energy efficiency to be optimized and is usually less costly than equipment replacement at a later time. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency equipment in the residential market.

Target Market and Eligibility Requirements

All residential customers of participating MRES members are eligible for the program. However, the primary target market is the HVAC contractor replacing or specifying heating and cooling equipment in a home.

Technology Categories

The technologies to be included within this program are high efficiency heating and cooling equipment. Guidelines for which equipment is specified as high efficiency will change over time as manufactured equipment specifications change. Initial standards will include:

- Central AC units with SEER ratings of 14.5 or above.
- Gas or electric furnaces or air handlers with ECM motors included
- Air Source Heat Pumps greater than or equal to 14.5 SEER and Home Seasonal Performance Factor (HSPF) greater than or equal to 8.2
* Mini-split air source heat pumps greater than or equal to 16.0 SEER
- Geothermal Heat Pumps

Market Barriers

Market barriers vary by technology and customer segment. They include, but are not limited to:

- Lack of investment funds or high costs
- Competition for funds with other home amenities
- Lack of awareness/knowledge by both customers and contractors
- Lack of time and resources by the contractor to learn about high efficiency alternatives
- Increased perceived risk from a newer technology in performance

Working with the homeowners and contractors and providing incentives, MRES and its members expect to reduce many of these barriers, stimulate installation of these measures, and improve equipment energy efficiency.

Delivery Strategy and Administration

The Residential HVAC Program is a homeowner or contractor incentive program that provides assistance for the installation of energy efficiency equipment in residential homes. Designated MRES/member staff person(s) will provide program administration, marketing, trade ally relationships, application and incentive processing, coordination of education and training activities, participation tracking and reporting, quality control, and technical support. Delivery of the program will be through a MRES/member staff who will work with the trade allies and retailers. They will build and support the retailer network and provide marketing and training.

Incentives

The incentives for the program will be provided once the equipment is certified as complying with the minimum standards. Incentives will be provided to the homeowner. The customer will have the option of assigning the incentives directly to the contractor. The initial incentive levels are described in Attachment B.

Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform homeowners, contractors and equipment distributors of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including contractors, equipment distributors, trade associations, and other parties of interest in the market. An important part of the marketing plan will be the content and functionality of the BES website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars implemented in each market to provide details about how to participate in the Program. The seminars will be tailored to the needs of homeowners, contractors and equipment distributors;
- A combination of strategies including local media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key contractors depending on the area.

*Marketing activities will include:

- o Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the member utility and the website. They will also be available through various public awareness events (presentations, home shows etc).
- o Targeted direct mailings used to educate homeowners on the benefits of the program and explaining how they can apply.
- o Customer and trade partner outreach and presentations (e.g. HBA and other contractor organizations) informing interested parties about the benefits of the program and how to participate.
- o Print advertisements to promote the program placed in selected local media including the member area newspapers and trade publications.
- o BES website content providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources.
- o Member customer account representatives trained to promote the program to their customers.
- o Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials.
- o Presentations by the program manager to key customers and customer groups to actively solicit their participation in the program.

- The marketing strategy will identify key customer segments and groups for target marketing, and will prepare specific outreach activities for these customers.
- MRES/member will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program.

Education/Instructions

Education and promotional materials will be developed for home owners and contractors on the benefits of high efficiency equipment and improved systems performance, including educational brochures, program promotional material, and website content. Specific educational and promotional efforts will be provided to help them promote energy efficient measures to the homeowners/buyers. This education will be through a combination of mailings, workshops, and direct meetings with key trade allies in the area.

Coordination with Trade Allies

A key aspect of success with this program will be through coordination with the market channels (trade allies) - contractors, developers, engineers, and architects. There will be special emphasis and resources assigned to work with HVAC contractors to overcome their barriers.

Tracking and Evaluation Methodology

The incentive levels set for the measures covered by the program will be assessed through a cost-effectiveness analysis using the DSMore model that evaluates the TRC, UCT, RIM, ST, and PT. The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs, and the program costs.

Evaluation plans will be developed once final programs are approved. They will include both impact and process evaluation efforts. For verification, all incentive applications will have a paper and calculation review. Field inspections will be completed on five percent of all installations. Tracking will be through the MRES database.

Energy Savings are based on MOES Database algorithms and other available information for measures not listed. Savings used in the DSMore calculations are listed in the Attachment B.

Cost Effectiveness of Energy Efficiency

Program Participation by Iowa MRES Members

Each Iowa member of MRES has a unique customer base made up of residential, commercial, and industrial customers. There are several types of challenges that must be taken into account by utilities as they strive to meet the energy efficiency goals that they set.

Some utilities have a larger commercial and industrial customer base than others, which provides a significantly greater opportunity for energy savings. Many small communities have a primarily residential customer base and experience a considerable challenge in the fact that the residents are often low income as well. In order to achieve an energy efficiency goal through residential programs, utilities must process many, many applications, each with a small amount of energy savings. In contrast, a small number of energy efficiency projects done by large customers could serve to meet the energy savings goal of the utility.

A utility with a single large customer (or a few large customers) that comprises ten percent or more of the utility's total sales can also experience a significant challenge in meeting their energy savings goals. When the utility has worked with that large customer to complete all of the energy efficiency measures that are currently available, then there may be no opportunity for energy savings remaining unless an applicable new technology would be introduced. Even though there may be no energy savings opportunity from that customer, the retail sales of electricity to that customer would continue to affect the utility's savings goal. For this reason, the Iowa MRES members have included an option in their respective resolutions to exclude sales to any electric customer using ten percent or more of the utility's total sales from the calculation of their efficiency commitment/goal. This exclusion applies to new large customer's loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. This exclusion will not bar the large customer from utilizing the utility's energy efficiency programs if new opportunities for energy savings arise. No customers have been excluded for the 2010-2012 reporting period.

Each Iowa MRES member utility made selections of energy efficiency programs to offer in their community based on the opportunity presented by their unique customer base. Those program selections are shown in Attachment C.

Program Costs/Budgets

Program costs were estimated based on the number of participants needed to achieve the savings goal for each Iowa MRES member utility, the incentive levels for each measure, and the program administration costs. Program administration costs include program development, administration, and measurement and verification, including the labor of utility staff, MRES staff, and subcontractors. Program administration costs also include marketing and promotion costs, including educational materials, meetings and presentations for customers and trade allies, as well as all forms, brochures, advertising, website costs, etc.

Direct incentives to customers are expected to be approximately 60 percent of the total program costs, with program administration costs anticipated at approximately 40 percent of the total cost. However, in the first years of program development, the administration costs are expected to be higher.

The overall program costs for the Iowa MRES members are estimated to be:

TOTAL PROGRAM BUDGETS

	Residential	C&I	Total Budget
2010	$118,893	$116,122	$235,015
2011	$186,752	$192,165	$388,917
2012	$315,770	$308,408	$624,177

A breakdown of program budgets by Iowa MRES member is found in Attachment D.

Expected Savings

MRES and its Iowa members used an evaluation software tool called DSMore to estimate participation and evaluate cost-effectiveness of the programs that were developed to meet the Iowa energy efficiency goals. Based on the estimates of participation and individual efficiency measures that could be installed, and the calculated or prescribed savings for each individual measure, the following is an estimate of kWh savings that will be achieved by the Iowa MRES members with each of the energy efficiency programs:

	Estimated Annual kWh Savings				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program	**2010**	**2011**	**2012**	**2013**	**2014**
C&I Lighting	797,092	1,323,173	2,130,308	2,364,642	2,601,106
C&I Cooling/Chiller	29,197	48,468	78,033	107,528	155,236
C&I Motors/Pumps/VFD	47,712	79,202	127,515	141,542	155,891
C&I Custom & New Construction					
and Targeted Audits	226,721	376,219	605,584	672,175	739,371
C&I Food Service	5,780	9,594	15,447	19,962	25,370
C&I Specialty Equipment	17,809	29,563	47,597	52,833	58,116
Residential HVAC	89,662	147,943	236,709	267,481	296,904
Residential New Construction	7,502	12,378	19,804	22,379	24,840
Residential Appliance Turn-in	176,286	290,872	465,396	525,897	583,746
ENERGY STAR Products	260,545	429,899	687,839	777,258	862,756
Totals	**1,658,306**	**2,747,311**	**4,414,232**	**4,951,697**	**5,503,336**

This table is also included as Attachment E. All estimates of kWh savings meet or exceed the energy efficiency goals set by the Iowa MRES members.

Cost-Effectiveness of Energy Efficiency Programs

The incentive levels set for the measures covered by the various programs were assessed through a cost-effectiveness analysis using the DSMore model that evaluates cost-effectiveness from various perspectives using the Standard Practice Manual Tests. Those tests are described as follows:

Utility Cost Test (UCT): The utility savings divided by the utility costs.

Total Resource Cost Test (TRC): The utility savings divided by the utility costs plus the participant costs.

Rate Payer Impact Test (RIM): The rate impacts of programs over the life of the program.

Societal Test (ST): The same as the Total Resource Cost Test plus non-energy benefits, such as reductions in pollutants.

Participant Test (PT): The benefit from the participant perspective, including savings from lower utility bills plus the program incentive divided by participant costs.

The cost-effectiveness tests evaluate the energy and demand savings, the associated avoided costs and net benefits to MRES members, the incremental or installed costs for the participant, and the program costs, including incentives and administration.

MRES and its Iowa members have chosen to use the Utility Cost Test (UCT) as the standard by which we determine whether or not a measure is cost-effective for MRES and the Iowa member utilities. An efficiency measure passes the UCT test when the cost savings to the utility (MRES and its members) through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. If a measure passes the UCT test, then MRES/members can be confident that the measure is cost-effective from the utility perspective. If the measure is not cost-effective or less cost-effective from other perspectives, then we know that it may be more difficult to overcome the market barriers associated with that measure. However, we will offer the measure to accommodate the special circumstances where customers may want to install the measure even though it may not be cost-effective from their perspective.

The following chart shows the overall cost-effectiveness of the portfolio of energy efficiency programs offered by the Iowa MRES members:

Standard Practice Manual Tests	Test Results
	Today's Value
Utility Cost Test	3.76
Total Resource Cost Test	2.14
Rate Payer Impact Test	0.85
Rate Payer Impact (Net Fuel)	1.41
Societal Test	2.29
Participant Test	3.03

The portfolio of energy efficiency programs passes every Standard Practice Manual Test, except the Rate Payer Impact Test. This is to be expected because there is a rate impact to offering incentive programs for energy efficiency. However, in the long-term, it is in the best interest of every rate payer for the utility to purchase energy efficiency as a resource, rather than buying that resource on the power market. It can also reduce or delay the construction of the next traditional supply-side resource, such as a combustion turbine. Energy efficiency is the least-cost resource for MRES and its members.

RESOLUTION NO. 09-48

The City Council of Alton, Iowa, met in Regular Session, in the Alton Council Chambers, City Hall, 905 Third Avenue, at 5:30 P.M. on Tuesday, November 10, 2009. There were present Mayor Minten, in the chair, and the following named council members:

Present: Bengard, Henrich, Kleinhesselink, Menning and Van Gelder
Absent:

Council member Henrich introduced the following Resolution entitled:

RESOLUTION ESTABLISHING ELECTRIC ENERGY EFFICIENCY GOALS FOR 2010, 2011, AND 2012.

and move that the same be adopted. Council member Bengard seconded the motion to adopt. The roll was called and the following vote was recorded:

Aye: Bengard, Henrich, Kleinhesselink, Menning and Van Gelder
Nay: None

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Alton Municipal Utilities (UTILITY) is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $4782.00 in 2010, $7914.00 in 2011, and $12701.00 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program

- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Alton Municipal Utility agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

NOW THEREFORE BE IT RESOLVED:, By the City Council of the City of Alton, Iowa that the Mayor and the City Clerk/Administrator are hereby authorized and directed to execute said Resolution.

Passed and approved this 10th day of November, 2009.

AYES:

NAYS:

ABSENT:

ABSTAIN:

Ronald Minten, Mayor

ATTEST:

Dale Oltmans, City Clerk/Administrator

RESOLUTION # 663

ESTABLISHMENT OF ELECTRIC ENERGY EFFICIENCY GOALS FOR 2010, 2011 AND 2012

WHEREAS, the Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS, a study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Denison Municipal Utilities (UTILITY) is .8 percent by 2012, and;

WHEREAS, reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts. and;

WHEREAS, investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED, for calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $65,725 in 2010, $108,765 in 2011, and $174,558 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

   Commercial & Industrial
   - Lighting Retrofit Program
   - Lighting in New Construction Program
   - Motors/Pumps/VFD Program
   - Cooling/Chiller Program
   - Custom Program
   - Food Service Program
   - Specialty Measures Program
   - Targeted Audit Program (schools)
   - C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded

from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Denison Municipal Utilities agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Passed and Approved on this 17th day of November, 2009.

Steve Martens

Steve Martens, Chairman

ATTEST:

Renee Vary

Renee Vary, Secretary

RESOLUTION #2009-34

A RESOLUTION FOR ESTABLISHMENT OF ELECTRIC ENERGY EFFICIENCY GOALS FOR 2010, 2011 AND 2012

WHEREAS, The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS, A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for the City of Hartley (UTILITY) is .8 percent by 2012, and;

WHEREAS, Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS, Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED, For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $8,049.00 in 2010, $13,321.00 in 2011, and $21,378.00 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program

- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

The City of Hartley agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

PASSED AND APPROVED this 9th day of November, 2009.

Clayton Pyle, Mayor

ATTEST:

Brian Pals, City Clerk/Administrator

Resolution 2009-41

Resolution for Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Hawarden Municipal Electric (UTILITY) is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $12,885 in 2010, $21,323 in 2011, and $34,221 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential

   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program

- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Hawarden Municipal Electric Utility agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

PASSED AND APPROVED this 18th day of November, 2009

Ricard R. Porter, Mayor

ATTEST:

Gary W. Tucker, City Administrator/CityClerk

KIMBALLTON CITY COUNCIL
RESOLUTION 09-01

WHEREAS, The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS, A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Kimballton Municipal Utilities is .8 percent by 2012, and;

WHEREAS, Reaching the cost-effective potential will require a significant expansion of the Kimballton Municipal Utilities' energy efficiency efforts, and;

WHEREAS, Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW, THEREFORE BE IT RESOLVED by the City Council of the City of Kimballton, Iowa, as follows:

(1) For calendar years 2010, 2011, and 2012, it shall be the goal of the Kimballton Municipal Utilities to reduce electricity consumption in the Kimballton Municipal Utilities service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the Kimballton Municipal Utilities and our consumer owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the Kimballton Municipal Utilities and/or its supplemental power supplier, MRES, will budget $1,036.00 in 2010, $1,714.00 in 2011, and $2,751.00 in 2012. It is the intent of the Kimballton Municipal Utilities to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

(2) For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the Kimballton Municipal Utilities through avoiding the purchase of kW and kWhs is greater than the cost of securing the resource through energy efficiency.

Initially, the Kimballton Municipal Utilities will use one or more of the following programs and measures:

- Residential
- Energy Star Products Program
- Residential HVAC Program
- Residential Lighting
  (community distributions and Change A Light)
- Appliance Turn-In Program
- Residential New Construction

Moved by: Tim Peterson to adopt; Seconded by: Yvonne Jensen

Ayes: Tim Peterson - Yvonne Jensen - Mike Jensen - Todd Larsen - Tony Petersen

Nays: None

Adopted this 2 day of November, 2009

Randy Poldberg, Mayor

ATTEST:

Shirlyn Petersen, City Clerk

Resolution # 08-09
Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Lake Park Municipal Utilities (UTILITY) is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $4,913.00 in 2010, $8,131.00 in 2011, and $13,049.00 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Lake Park Municipal Utilities agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Brent Jacobsen, Chairman

Vivian Lalone, Secretary/Treasurer

Manilla Municipal Board of Trustee's

Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012
Passed November 12, 2009
Resolution No. 09-8

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Manilla Municipal Utilities (UTILITY) is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $3196 in 2010, $5290 in 2011, and $8490 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)

- Appliance Turn-In Program
- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Manilla Municipal Utilities agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

_____
Board Chair

_____
Secretary

RESOLUTION NO. 11-2-09-1311
ESTABLISHMENT OF ELECTRIC ENERGY EFFICIENCY GOALS
FOR 2010, 2011, AND 2012

WHEREAS, The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS, A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Orange City Municipal Utilities (UTILITY) is .8 percent by 2012, and;

WHEREAS, Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS, Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED, For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $40,821 in 2010, $67,553 in 2011, and $108,416 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of kW and kWhs is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

Residential

- Energy Star Products Program
- Residential HVAC Program
- Residential Lighting (community distributions and Change A Light)
- Appliance Turn-In Program
- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customers using 10 percent or more of the UTIILTY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customers. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may not need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Orange City Municipal Utilities agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Passed and approved this 2nd day of November, 2009.

Daryl Beltman

Daryl Beltman, Mayor

ATTEST: Janet Brown

Janet Brown, City Clerk

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NOV 0 6 2009
MISSOURI RIVER
ENERGY SERVICES

Resolution # 09- 25

Resolution to Establish Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for the City of Paullina is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $4,393 in 2010, $7,269 in 2011, and $ 11,666 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

The City of Paullina agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Marlo Ebel

Marlo Ebel, Mayor

Sandy Fritz

Sandy Fritz, City Clerk

RESOLUTION NO. 2009-37

Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for City of Primghar is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the City of Primghar's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the City of Primghar and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the City of Primghar and/or its supplemental power supplier, MRES, will budget $3,843.00 in 2010, $ 3,843.00 in 2011, and $10,206.00 in 2012. It is the intent of the City of Primghar to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the City of Primghar through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the City of Primghar will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

   Commercial & Industrial
   - Lighting Retrofit Program
   - Lighting in New Construction Program
   - Motors/Pumps/VFD Program
   - Cooling/Chiller Program
   - Custom Program
   - Food Service Program
   - Specialty Measures Program
   - Targeted Audit Program (schools)
   - C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the City of Primghar's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the City of Primghar employs. The City of Primghar recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the City of Primghar's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

City of Primghar agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

NOW THEREFORE BE IT RESOLVED BY the City Council of the City of Primghar, Iowa, that Resolution 2009-37 "Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012", be adopted.

AYES : _____

NAYS : _____

Whereupon the Mayor declared Resolution No. 2009-37 is hereby Adopted and Approved on this 9th day of November, 2009.

_____
James A. Thompson, Mayor

ATTEST:

_____ CMC
Linda K. Nieman, Deputy City Clerk

REGULAR MEETING, BOARD OF TRUSTEES
ROCK RAPIDS UTILITIES
NOVEMBER 23, 2009 at 7:00 AM

RESOLUTION NO. 24-09
RESOLUTION FOR THE ESTABLISHMENT OF ELECTRIC ENERGY EFFICIENCY GOALS FOR 2010, 2011 AND 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies; and

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Rock Rapids Municipal Utility (UTILITY) is 0.8 percent by 2012; and

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts; and

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers:

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011 and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by 0.3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is 0.5 percent and for 2012, the goal is 0.8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES,willbudget$12,703 in2010, $21,022 in2011, and$33,739in2012. Itisthe intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve one percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UTC). Initially, the UTILITY will use one or more of the following programs and measures:

Residential

x Energy Star Products Program
x Residential HVAC Program
x Residential Lighting (community distributors and Change A Light) x Appliance Turn-In Program
x Residential New Construction

Commercial

x Lighting Retrofit Program
x Lighting in New Construction Program x Motors/Pumps/VFD Program x Cooling/Chiller Program
x Custom Program
x Food Service Program
x Specialty Measures Program
x Targeted Audit Program (schools) x C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Rock Rapids Municipal Utility agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Passed and approved this 23rd day of November, 2009.

Chairman ATTEST:

Secretary

RESOLUTION 2009-07
Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Sanborn Electric & Telecommunications Utility is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $9,222 in 2010, $15,261 in 2011, and $24,493 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Sanborn Electric & Telecommunications Utility agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Terry Boelter, D.D.S., Secretary

Attest:

Jim Zeutenhorst, City Administrator

Resolution 12-09
Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for the City of Shelby (UTILITY) is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the UTILITY's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the UTILITY to reduce electricity consumption in the UTILITY's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the UTILITY and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the UTILITY and/or its supplemental power supplier, MRES, will budget $ 2156 in 2010, $3568 in 2011, and $5726 in 2012. It is the intent of the UTILITY to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the UTILITY through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the UTILITY will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the UTILITY's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the UTILITY employs. The UTILITY recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the UTILITY's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

The City of Shelby agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Ron Kroll
Mayor

Chris M Martin
Attest, City Clerk

Sioux Center
growing bright

CITY OF SIOUX CENTER, IOWA 51250
335 First Avenue NW

712-722-0761 • Fax 712-722-0760
www.siouxcenter.org

RESOLUTION NO. SC-R-57-09

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SIOUX CENTER, IOWA, ESTABLISHING ELECTRIC ENERGY EFFICIENCY GOALS FOR CALENDAR YEARS 2010, 2011 AND 2012

WHEREAS, the Iowa General Assembly has directed each Iowa municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS, a study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for the Sioux Center Municipal Electric Utility is .8 percent by 2012, and;

WHEREAS, reaching the cost-effective potential will require a significant expansion of the Sioux Center Municipal Electric Utility's energy efficiency efforts, and;

WHEREAS, investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED for calendar years 2010, 2011 and 2012, it shall be the goal of the Sioux Center Municipal Utility to reduce electricity consumption in the utility's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the Sioux Center Municipal Electric Utility and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the Sioux Center Municipal Electric Utility and/or its supplemental power supplier, MRES, will budget $47,655 in 2010, $78,863 in 2011, and $126,568 in 2012. It is the intent of the Sioux Center Municipal Electric Utility to continue to increase energy efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the Sioux Center Municipal Electric Utility through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the Sioux Center Municipal Electric Utility will use one or more of the following programs and measures:

Residential

- Energy Star Products Program
- Residential HVAC Program
- Residential Lighting (community distributions and Change A Light)
- Appliance Turn-In Program
- Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/ VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the Sioux Center Municipal Electric Utility's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the Sioux Center Municipal Electric Utility employs. The Sioux Center Municipal Electric Utility recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the Sioux Center Municipal Electric Utility's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

The Sioux Center Municipal Electric Utility agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

PASSED AND APPROVED this 18th day of November, 2009.

Mayor Dennis Walstra

Paul Clousing, City Clerk

Establishment of Electric Energy Efficiency Goals for 2010, 2011 and 2012
Resolution NO. 09-12-01

WHEREAS: The Iowa General Assembly has directed each municipal gas and electric utility to assess the cost-effective energy efficiency potential in their service area and to set goals and establish programs for capturing those efficiencies, and;

WHEREAS: A study conducted jointly with other municipal utilities who are members of Missouri River Energy Services (MRES) estimates that the cost-effective energy efficiency potential for Woodbine Municipal Light & Power is .8 percent by 2012, and;

WHEREAS: Reaching the cost-effective potential will require a significant expansion of the Woodbine Municipal Light & Power's energy efficiency efforts, and;

WHEREAS: Investment in cost-effective energy efficiency is, by definition, less costly than the alternative of providing the energy avoided by the efficiency measure and is therefore in the best interest of consumers;

NOW THEREFORE BE IT RESOLVED: For calendar years 2010, 2011, and 2012, it shall be the goal of the Woodbine Municipal Light & Power to reduce electricity consumption in the Woodbine Municipal Light & Power's service area as follows:

For 2010, by .3 percent of the 2005-2007 average retail sales using cost-effective measures that improve the efficiency with which the Woodbine Municipal Light & Power and our consumer-owners use energy. The efficiency goal for 2011 is .5 percent and for 2012, the goal is .8 percent. To achieve these goals, the Woodbine Municipal Light & Power and/or its supplemental power supplier, MRES, will budget $6,600 in 2010, $11,000 in 2011, and $17,500 in 2012. It is the intent of the Woodbine Municipal Light & Power to continue to increase efficiency efforts in 2013 and 2014 in order to ultimately achieve 1 percent savings in 2014.

For purposes of this resolution:

a. Cost-effective measures are those for which the cost savings to the Woodbine Municipal Light & Power through avoiding the purchase of demand (kW) and energy (kWh) is greater than the cost of securing that resource through energy efficiency. This is commonly referred to as the Utility Cost Test (UCT). Initially, the Woodbine Municipal Light & Power will use one or more of the following programs and measures:

   Residential
   - Energy Star Products Program
   - Residential HVAC Program
   - Residential Lighting (community distributions and Change A Light)
   - Appliance Turn-In Program
   - Residential New Construction

Commercial & Industrial

- Lighting Retrofit Program
- Lighting in New Construction Program
- Motors/Pumps/VFD Program
- Cooling/Chiller Program
- Custom Program
- Food Service Program
- Specialty Measures Program
- Targeted Audit Program (schools)
- C & I New Construction Program

b. For purposes of determining the energy efficiency goal, sales to any electric customer using 10 percent or more of the Woodbine Municipal Light & Power's total sales may be excluded from the calculation of the efficiency commitment if it is determined that there is little or no energy savings opportunity from that customer. This exclusion applies to new large customer loads and/or to large customers who have implemented all cost-effective energy efficiency measures within their facility. Such exclusion shall not bar a large customer from energy efficiency programs.

c. The reduction in energy consumption reported and used to determine whether the goal has been met is the combined energy savings from each energy efficiency measure the Woodbine Municipal Light & Power employs. The Woodbine Municipal Light & Power recognizes that the potential to achieve this goal cannot be known with certainty and may need to be adjusted. Adjustments may also need to be made when significant changes in load occur. Furthermore, the Woodbine Municipal Light & Power's success in reducing consumption will not occur evenly over time and results that exceed one year's goal may be carried forward and reported for the following year or years of the reporting cycle. Savings from programs begun in the "ramp-up" year of 2009 will be carried forward to 2010.

Woodbine Municipal Light & Power agrees to participate in a joint filing with other MRES Iowa members and authorizes MRES to prepare the required energy efficiency report for submission to the Iowa Association of Municipal Utilities who will file the report with the Iowa Utilities Board (IUB) by January 1, 2010.

Passed and approved this 8th day of December, 2009

Donald Kenkel, Chairman of the Board

ATTEST:

Theresa Corrin, Secretary

Energy Energy Program	Energy Efficiency Measures	Incentive per Measure	Measure Life	Calculated kWh Savings/ Participant	Calculated kW Savings/ Participant	Incremental Replacement Cost
C & I Lighting	T-8 8ft 1 lamp	$ 7.00	12	57	0.01	$ 20.00
Program	T-8 8ft 2 lamp	$ 9.00	12	69	0.02	$ 20.00
	T-8 4ft 4 lamp	$ 13.00	12	130	0.03	$ 10.00
	T-8 4ft 3 lamp	$ 11.00	12	122	0.03	$ 10.00
	T-8 4ft 2 lamp	$ 6.00	12	57	0.01	$ 10.00
	T-8 4ft 1 lamp	$ 5.00	12	49	0.01	$ 10.00
	T-8 2ft 4 lamp	$ 8.00	12	87	0.02	$ 57.00
	T-8 2ft 3 lamp	$ 7.00	12	79	0.02	$ 54.00
	T-8 2ft 2 lamp	$ 6.00	12	39	0.01	$ 36.00
	T-8 2ft 1 lamp	$ 5.00	12	31	0.01	$ 33.00
	T-8 HO 8 ft 1 Lamp	$ 12.00	12	98	0.02	$ 66.00
	T-8 HO 8 ft 2 Lamp	$ 16.00	12	197	0.04	$ 72.00
	T-8 4ft 2 lamp w reflector replacing T12 4 ft 4-lamp	$ 28.00	12	368	0.10	$ 73.00
	T-8 4ft 2 lamp w reflector replacing T12 8 ft 2-lamp	$ 20.00	12	295	0.08	$ 77.00
	T-8 4ft 3 lamp w reflector replacing T12 4 ft 4-lamp	$ 20.00	12	253	0.07	$ 91.00
	HPT8 4ft 1 lamp	$ 6.00	12	20	0.00	$ 38.00
	T8 High Performance, 2-F32T8HP 32W, 1-ELEC HP RLO	$ 7.00	12	53	0.01	$ 20.00
	T8 High Performance, 3-F32T8HP 32W, 1-ELEC HP RLO	$ 12.00	12	73	0.02	$ 20.00
	T8 High Performance, 4-F32T8HP 32W, 1-ELEC HP RLO	$ 14.00	12	73	0.02	$ 20.00
	T12 8ft 1 lamp retrofit to HPT8 T-8 4ft Hi Performance 2 lam	$ 8.00	12	71	0.02	$ 41.00
	T12 8ft 2 lamp retrofit to HPT8 T-8 4ft Hi Performance 4 lam	$ 16.00	12	51	0.01	$ 66.00
	T12HO 8ft 1 lamp retrofit to HPT8 T-8 4ft Hi Performance 2 l	$ 20.00	12	185	0.04	$ 41.00
	T12HO 8ft 2 lamp retrofit to HPT8 T-8 4ft Hi Perormance 4 la	$ 30.00	12	315	0.07	$ 66.00
	Low Watt HPT8 4ft 1 lamp of 28W or less	$ 7.00	12	31	0.01	$ 37.00
	Low Watt HPT8 4ft 2 lamp of 28W or less	$ 9.00	12	51	0.01	$ 39.00
	Low Watt HPT8 4ft 3 lamp of 28W or less	$ 13.50	12	67	0.02	$ 58.00
	Low Watt HPT8 4ft 4 lamp of 28W or less	$ 18.00	12	98	0.02	$ 60.00
	Low Watt T8 lamps	$ 0.50	12	19	0.00	$ 2.00
	Low Watt Relamp 54W 8' T-8	$ 0.50	12	19	0.00	$ 2.00
	LED Exit Signs Electronic Fixtures (Retrofit Only)	$ 12.00	12	166	0.03	$ 25.00
	CFL Fixture- All W	$ 22.00	12	476	0.12	$ 45.00
	Screw-In CFL 9W-15 W	$ 1.50	12	126	0.03	$ 4.31
	1 Lamp T-5 with Elec Ballast replacing T-12	$ 7.00	12	61	0.02	$ 27.00
	2 Lamp T-5 replacing T-12	$ 9.00	12	47	0.01	$ 74.12
	Occupancy Sensors under 500 W	$ 20.00	10	283	0.07	$ 55.00
	Occupancy Sensors over 500 W	$ 40.00	10	547	0.14	$ 125.00

	LED Auto Traffic Signals	$ 25.00	10	328	0.06	$ 120.83
	LED Pedestrian Signals	$ 22.00	11	161	0.03	$ 92.50
	Light Tube	$ 75.00	14	371	0.09	$ 500.00
	High Bay 2L T5HO Replace 150-175 W HID	$ 60.00	12	373	0.09	$ 160.00
	High Bay 2L T5HO Replace 250W HID	$ 75.00	12	773	0.19	$ 160.00
	High Bay 3L T5HO Replace 250 W	$ 70.00	12	502	0.12	$ 180.00
	Hi Bay 4LT5HO Replace 400 W	$ 90.00	12	970	0.23	$ 192.00
	High Bay 6L T5HO Replace 400 W	$ 70.00	12	373	0.09	$ 300.00
	High Bay 6L T5HO Replace 750 W	$ 125.00	12	2,100	0.51	$ 300.00
	High Bay 8L T5HO Replace 750 W	$ 110.00	12	1,576	0.38	$ 350.00
	High Bay 8L T5HO Replace 1000 W	$ 200.00	12	2,572	0.62	$ 350.00
	Hi Bay 10LT5HO Replace 1000W	$ 175.00	12	2,143	0.52	$ 400.00
	High Bay 12L T5HO Double fixture replace 1000W HID	$ 150.00	12	1,452	0.35	$ 600.00
	High Bay Fluorescent 3LF32T8 Replaces 150W	$ 45.00	12	478	0.11	$ 150.00
	High Bay Fluorescent 4LF32T8 Replaces 250W	$ 70.00	12	611	0.15	$ 160.00
	Hi Bay Fluorescent 6LF32T8 - Replaces 400W	$ 85.00	12	1,013	0.24	$ 160.00
	Hi Bay Fluorescent 6LF32T8 - Replaces 750W	$ 120.00	12	2,733	0.66	$ 160.00
	High Bay Flourescent 8LF32T8 - Replaces 400W	$ 70.00	12	647	0.16	$ 200.00
	High Bay Flourescent 8LF32T8 - Replaces 750W	$ 100.00	12	2,386	0.57	$ 200.00
	High Bay Fluorescent 10LF32T8 - replace 1000W HID	$ 150.00	12	3,091	0.74	$ 250.00
	High Bay Fluorescent 12LF32T8 - replace 1000W HID	$ 140.00	12	2,736	0.66	$ 320.00
	High Bay Fluorescent 16LF32T8 - Double 8L fixture replace	$ 130.00	12	2,087	0.50	$ 395.00
	HE Exterior LED-Induction up to 175W HID retrofit	$ 80.00	12	280	-	$ 400.00
	HE Exterior LED-Induction between 175 to 250W HID retrofit	$ 100.00	12	425	-	$ 500.00
	HE Exterior LED-Induction between 250 to 400W HID retrofit	$ 120.00	12	736	-	$ 800.00
	HE Exterior Lighting LED- Induction replacing 750 to 1000W	$ 225.00	12	1,015	-	$ 1,000.00
	HE Garage Lighting LED- Induction up to 175W HID retrofit	$ 80.00	12	642	0.11	$ 400.00
	HE Garage Lighting LED - Induction betweem 175W to 250W	$ 100.00	12	983	0.18	$ 500.00
	HE Garage Lighting LED- Induction between 250W to 400W	$ 120.00	12	1,695	0.30	$ 800.00
	HE Garage Lighting LED- Induction replacing 750 to 1000W	$ 225.00	12	3,479	0.62	$ 1,000.00
	Exterior Lighting Bi-Level Control with Override 150 to 1000 H	$ 100.00	12	537	-	$ 300.00
	Central Lighting Control	$ 486.48	10	12,284	2.78	$ 2,700.00
	Switching Controls for Multilevel Lighting	$ 380.44	10	9,607	2.18	$ 3,000.00
	Daylight Sensor controls	$ 22.32	10	364	0.09	$ 65.00
	320W Pulse Start Metal Halide	$ 20.00	12	385	0.09	$ 30.00
	750W Pulse Start Metal Halide	$ 30.00	12	1,139	0.27	$ 30.00
	Ceramic Metal Halide 20 W Elec	$ 75.00	12	327	0.08	$ 192.00
	Ceramic Metal Halide 39 W Elec	$ 75.00	12	458	0.11	$ 222.00
	Ceramic Metal Halide 150 W Elec	$ 75.00	12	564	0.14	$ 145.33

	Multi-CFL, 4-pin, 8- 42W lamps, 4- 2-lamp ballasts	$ 50.00	12	372	0.09	$ 151.00
C & I Cooling/	High Eff PTAC Electric - 7 kBtu 0.58 tons	$ 20.00	15	109	0.05	$ 105.00
Chiller Program	High Eff PTAC Electric - 7 to 15 kBtu .58 to 1.25 tons	$ 20.00	15	184	0.08	$ 166.00
	High Eff PTAC Electric - 15 kBtu 1.25 tons	$ 20.00	15	162	0.07	$ 226.00
	HVAC_AC 65,000 1 Ph	$ 120.00	15	815	0.37	$ 581.71
	AC less than 65 kBTU 5.42 tons	$ 120.00	15	1,339	0.61	$ 581.71
	AC 65 to 135 kBtu 5.42 to 11.25 tons	$ 360.00	15	2,726	1.25	$ 1,140.42
	AC 135 to 239 KBTU 11.25 to 20 tons	$ 600.00	15	6,015	2.76	$ 1,411.01
	AC 240 to 759 kBTU 20 to 63.3 tons	$ 1,600.00	15	11,680	4.92	$ 3,940.58
	AC more than 760 kBTU 63.3 tons	$ 2,800.00	15	13,633	5.74	$ 6,373.59
	HP less than 65,000 1 Ph	$ 80.00	15	761	0.35	$ 270.00
	HP less than 65,000 3 Ph	$ 80.00	15	486	0.22	$ 270.00
	HP 65,000 - 135,000	$ 225.00	15	1,755	0.80	$ 803.00
	HP 135,000 - 240,000	$ 525.00	15	3,731	1.71	$ 1,496.00
	HP greater than 240,000	$ 1,400.00	15	6,055	2.55	$ 1,804.00
	ES Window AC over 14,000 Btu hr	$ 70.00	10	214	0.10	$ 100.00
	ES Window AC under 14,000 Btu hr	$ 35.00	10	98	0.04	$ 70.00
	ES Sleeve AC over 14,000 Btu hr	$ 70.00	10	188	0.09	$ 100.00
	ES Sleeve AC under 14,000 Btu hr	$ 35.00	10	85	0.04	$ 70.00
	Ground Source HP Closed Loop-200 per ton,$25 per ton per	$ 1,100.00	15	13,703	2.45	$ 7,000.00
	Ground Source HP Open Loop-200 per ton,$25 per ton per E	$ 1,100.00	15	10,514	1.88	$ 7,000.00
	Ground Source Desuperheater	$ 250.00	15	1,282	0.23	$ 900.00
	HP Water Heater 50-100 MBH	$ 3,500.00	15	55,535	9.95	$ 7,000.00
	HP Water Heater 100-300 MBH	$ 5,000.00	15	148,093	22.27	$ 10,000.00
	HP Water Heater 300-500 MBH	$ 7,000.00	15	296,185	44.55	$ 14,000.00
	Setback_Programmable Thermostat	$ 50.00	10	9,468	1.70	$ 100.00
	Chilled Water Reset Air Cooled 0-100 tons	$ 350.00	10	3,238	0.80	$ 1,100.00
	Chilled Water Reset Air Cooled 100-200 tons	$ 750.00	10	9,714	2.39	$ 1,100.00
	Chilled Water Reset Air Cooled 200-300 tons	$ 875.00	10	16,190	3.99	$ 1,100.00
	Chilled Water Reset Air Cooled 300-400 tons	$ 875.00	10	22,666	5.58	$ 1,100.00
	Chilled Water Reset Air Cooled 400-500 tons	$ 900.00	10	29,143	6.35	$ 1,100.00
	Chilled Water Reset Water Cooled 0-1000 tons	$ 500.00	10	12,879	3.17	$ 1,100.00
	Chilled Water Reset Water Cooled 1000-2000 tons	$ 750.00	10	38,636	8.42	$ 1,100.00
	Chilled Water Reset Water Cooled 2000-3000 tons	$ 875.00	10	64,392	14.04	$ 1,100.00
	High Eff Air-Cooled Chiller less than 150 tons	$ 3,000.00	20	15,637	3.85	$ 3,993.50
	High Eff Air-Cooled Chiller more than 150 tons	$ 8,000.00	20	39,093	9.63	$ 9,983.75
	High Eff Centrifugal Chiller less than 150 ton	$ 1,500.00	20	10,008	2.47	$ 14,551.90
	High Eff Centrifugal Chiller 150 - 300 ton	$ 10,000.00	20	25,019	6.16	$ 23,460.50

	High Eff Centrifugal Chiller greater than 300 ton	$ 20,000.00	20	55,512	13.68	$ 32,790.50
Motors/Pumps/	Motors 1-5 HP - Incentives per HP	$ 37.50	20	95	0.03	$ 58.00
VFD Program	Motors 7,5 -20 HP - Incentives per HP	$ 131.00	20	486	0.10	$ 117.25
	Motors 25-100 HP - Incentives per HP	$ 271.50	20	1,600	0.27	$ 371.00
	Motors 125-250 HP - Incentives per HP	$ 725.20	20	3,898	0.60	$ 904.33
	Pumps HP 1,5	$ 60.00	15	239	0.08	$ 350.00
	Pumps HP 2	$ 70.00	15	318	0.10	$ 350.00
	Pumps HP 3	$ 100.00	15	477	0.16	$ 350.00
	Pumps HP 5	$ 100.00	15	796	0.26	$ 341.00
	Pumps HP 7,5	$ 200.00	15	1,194	0.39	$ 498.00
	Pumps HP 10	$ 260.00	15	1,592	0.52	$ 332.00
	Pumps HP 15	$ 300.00	15	2,387	0.79	$ 585.00
	Pumps HP 20	$ 400.00	15	3,183	1.05	$ 850.00
	VFD HP 1.5 Pumping HVAC Appl	$ 60.00	15	1,679	0.46	$ 1,445
	VFD HP 2 Pumping HVAC Appl	$ 80.00	15	2,238	0.61	$ 1,645
	VFD HP 3 Pumping HVAC Appl	$ 120.00	15	3,358	0.92	$ 1,845
	VFD HP 5 Pumping HVAC Appl	$ 200.00	15	5,596	1.53	$ 2,070
	VFD HP 7.5 Pumping HVAC Appl	$ 300.00	15	8,394	2.30	$ 2,860
	VFD HP 10 Pumping HVAC Appl	$ 400.00	15	11,192	3.06	$ 2,860
	VFD HP 15 Pumping HVAC Appl	$ 600.00	15	16,788	4.59	$ 3,265
	VFD HP 20 Pumping HVAC Appl	$ 800.00	15	22,384	6.12	$ 4,515
	VFD HP 25 Pumping HVAC Appl	$ 1,000.00	15	27,980	7.65	$ 5,120
	VFD HP 30 Pumping HVAC Appl	$ 1,200.00	15	33,576	9.18	$ 5,770
	VFD HP 40 Pumping HVAC Appl	$ 1,600.00	15	44,768	12.24	$ 8,095
	VFD HP 50 Pumping HVAC Appl	$ 2,000.00	15	55,960	15.30	$ 8,950
	VFD HP 60 Pumping HVAC Appl	$ 2,400.00	15	67,152	18.36	$ 10,200
	VFD HP 75 Pumping HVAC Appl	$ 3,000.00	15	83,941	22.95	$ 13,350
	VFD HP 100 Pumping HVAC Appl	$ 4,000.00	15	111,921	30.60	$ 13,800
	VFD HP 150 Pumping HVAC Appl	$ 6,000.00	15	167,881	45.90	$ 18,750
	VFD HP 200 Pumping HVAC Appl	$ 8,000.00	15	223,841	61.20	$ 23,200
	VFD HP 1.5 Fan HVAC Appl	$ 60.00	15	965	0.26	$ 1,445
	VFD HP 2 Fan HVAC Appl	$ 80.00	15	1,287	0.35	$ 1,645
	VFD HP 3 Fan HVAC Appl	$ 120.00	15	1,931	0.53	$ 1,845
	VFD HP 5 Fan HVAC Appl	$ 200.00	15	3,218	0.88	$ 2,070
	VFD HP 7.5 Fan HVAC Appl	$ 300.00	15	4,827	1.32	$ 2,860
	VFD HP 10 Fan HVAC Appl	$ 400.00	15	6,436	1.76	$ 2,860
	VFD HP 15 Fan HVAC Appl	$ 600.00	15	9,654	2.64	$ 3,265
	VFD HP 20 Fan HVAC Appl	$ 800.00	15	12,872	3.52	$ 4,515

	VFD HP 25 Fan HVAC Appl	$ 1,000.00	15	16,091	4.40	$ 5,120
	VFD HP 30 Fan HVAC Appl	$ 1,200.00	15	19,309	5.28	$ 5,770
	VFD HP 40 Fan HVAC Appl	$ 1,600.00	15	25,745	7.04	$ 8,095
	VFD HP 50 Fan HVAC Appl	$ 2,000.00	15	32,181	8.80	$ 8,950
	VFD HP 60 Fan HVAC Appl	$ 2,400.00	15	38,617	10.56	$ 10,200
	VFD HP 75 Fan HVAC Appl	$ 3,000.00	15	48,272	13.20	$ 13,350
	VFD HP 100 Fan HVAC Appl	$ 4,000.00	15	64,362	17.60	$ 13,800
	VFD HP 150 Fan HVAC Appl	$ 6,000.00	15	96,543	26.40	$ 18,750
	VFD HP 200 Fan HVAC Appl	$ 8,000.00	15	128,725	35.20	$ 23,200
	VFD HP 1.5 Pumping Process Appl	$ 60.00	15	1,676	0.46	$ 333
	VFD HP 2 Pumping Process Appl	$ 80.00	15	2,235	0.61	$ 444
	VFD HP 3 Pumping Process Appl	$ 120.00	15	3,353	0.92	$ 666
	VFD HP 5 Pumping Process Appl	$ 200.00	15	5,588	1.53	$ 1,110
	VFD HP 7.5 Pumping Process Appl	$ 300.00	15	8,382	2.30	$ 1,665
	VFD HP 10 Pumping Process Appl	$ 400.00	15	11,177	3.06	$ 2,220
	VFD HP 15 Pumping Process Appl	$ 600.00	15	16,765	4.59	$ 3,330
	VFD HP 20 Pumping Process Appl	$ 800.00	15	22,353	6.12	$ 4,440
	VFD HP 25 Pumping Process Appl	$ 1,000.00	15	27,941	7.65	$ 5,550
	VFD HP 30 Pumping Process Appl	$ 1,200.00	15	33,530	9.18	$ 6,660
	VFD HP 40 Pumping Process Appl	$ 1,600.00	15	44,706	12.24	$ 8,880
	VFD HP 50 Pumping Process Appl	$ 2,000.00	15	55,883	15.30	$ 11,100
	VFD HP 60 Pumping Process Appl	$ 2,400.00	15	67,060	18.36	$ 10,200
	VFD HP 75 Pumping Process Appl	$ 3,000.00	15	83,825	22.95	$ 13,350
	VFD HP 100 Pumping Process Appl	$ 4,000.00	15	111,767	30.60	$ 13,800
	VFD HP 150 Pumping Process Appl	$ 6,000.00	15	167,650	45.90	$ 18,750
	VFD HP 200 Pumping Process Appl	$ 8,000.00	15	223,534	61.20	$ 23,200
	VFD HP 1.5 Fan Process Appl	$ 60.00	15	964	0.26	$ 1,445
	VFD HP 2 Fan Process Appl	$ 80.00	15	1,285	0.35	$ 1,645
	VFD HP 3 Fan Process Appl	$ 120.00	15	1,928	0.53	$ 1,845
	VFD HP 5 Fan Process Appl	$ 200.00	15	3,214	0.88	$ 2,070
	VFD HP 7.5 Fan Process Appl	$ 300.00	15	4,821	1.32	$ 2,860
	VFD HP 10 Fan Process Appl	$ 400.00	15	6,427	1.76	$ 2,860
	VFD HP 15 Fan Process Appl	$ 600.00	15	9,641	2.64	$ 3,265
	VFD HP 20 Fan Process Appl	$ 800.00	15	12,855	3.52	$ 4,515
	VFD HP 25 Fan Process Appl	$ 1,000.00	15	16,068	4.40	$ 5,120
	VFD HP 30 Fan Process Appl	$ 1,200.00	15	19,282	5.28	$ 5,770
	VFD HP 40 Fan Process Appl	$ 1,600.00	15	25,709	7.04	$ 8,095
	VFD HP 50 Fan Process Appl	$ 2,000.00	15	32,137	8.80	$ 8,950
	VFD HP 60 Fan Process Appl	$ 2,400.00	15	38,564	10.56	$ 10,200

	VFD HP 75 Fan Process Appl	$ 3,000.00	15	48,205	13.20	$ 13,350
	VFD HP 100 Fan Process Appl	$ 4,000.00	15	64,274	17.60	$ 13,800
	VFD HP 150 Fan Process Appl	$ 6,000.00	15	96,411	26.40	$ 18,750
	VFD HP 200 Fan Process Appl	$ 8,000.00	15	128,547	35.20	$ 23,200
Specialty Measures	Commercial Clothes Washers - electric water heater	$ 50.00	10	90	0.02	$ 240.00
Program	Plug Load Occupancy Sensors Document Stations	$ 25.00	4	203	0.04	$ 15.00
	Vending Equipment Controller	$ 50.00	10	1,312	0.24	$ 180.00
	Anti Sweat Heater Controls	$ 100.00	10	18,732	4.16	$ 2,450.00
	Night covers for displays	$ 10.00	15	98	-	$ 35.00
	Engineered Nozzles - COMPRESS AIR	$ 20.00	15	9,104	3.86	$ 80.00
	HVAC_Window Film	$ 298.00	10	1,877	0.52	$ 149.00
	OTHER_CompPowerMgr	$ 15.00	4	709	0.13	$ 30.00
Food Service	ENERGY STAR Commercial Solid Door Refrigerators less th	$ 100.00	12	950	0.17	$ 250.00
Program	ENERGY STAR Commercial Solid Door Refrigerators 20-48	$ 150.00	12	1,122	0.20	$ 500.00
	ENERGY STAR Commercial Solid Door Refrigerators greate	$ 250.00	12	1,429	0.26	$ 900.00
	ENERGY STAR Coimmercial Solid Door Freezers less than 2	$ 60.00	12	546	0.10	$ 150.00
	ENERGY STAR Coimmercial Solid Door Freezers 20-48 ft3	$ 150.00	12	532	0.10	$ 400.00
	ENERGY STAR Coimmercial Solid Door Freezers greater tha	$ 250.00	12	507	0.09	$ 700.00
	Energy Efficient Ice Machines less than 500 lbs per day	$ 200.00	12	1,735	0.31	$ 600.00
	Energy Efficient Ice Machines 500-1000 lbs per day	$ 300.00	12	2,830	0.51	$ 1,500.00
	Energy Efficient Ice Machines greater than 1000 lbs per day	$ 600.00	12	6,350	1.14	$ 2,000.00
	ES 3 Pan Steam Cooker	$ 300.00	12	11,747	2.10	$ 4,150.00
	ES 4 Pan Steam Cooker	$ 400.00	12	12,767	2.29	$ 4,150.00
	ES 5 Pan Steam Cooker	$ 500.00	12	13,796	2.47	$ 4,150.00
	ES 6 Pan Steam Cooker	$ 600.00	12	15,929	2.85	$ 4,150.00
	ES Hot Holding Cabinets - Full Size Cabinets	$ 400.00	12	4,673	1.01	$ 1,783.00
	ES Holding Cabinets - Three Quarter Size	$ 300.00	12	2,531	0.55	$ 1,783.00
	ES Holding Cabinets - Half Size Cabinets	$ 200.00	12	1,606	0.35	$ 1,783.00
	ENERGY STAR Fryers	$ 500.00	12	1,364	0.29	$ 4,000.00
	Griddles	$ 850.00	11	2,422	0.52	$ 1,700.00
	Convection Ovens	$ 1,500.00	11	9,951	2.41	$ 3,000.00
	Combination Ovens	$ 1,000.00	11	18,213	4.41	$ 16,884.00
	LED reach-in refrigerated case lighting	$ 25.00	12	354	0.06	$ 300.00
Custom, Targeted	Custom Level 1 - based on actual kW & kWh savings	$300/kW + $.(	10	21,000	3.16	case by case
Audit Program &	Custom Level 2	TBD	10	1,050	0.16	case by case
C&I New Construction	Custom Level 3	TBD	10	1,050	0.16	case by case

Residential HVAC	Ground Source HP Closed Loop $200ton+$25tonEER	$ 1,100.00	15	10,514	1.52	$ 7,000.00
Program	HP ECM	$ 150.00	15	968	0.14	$ 500.00
	GAS ECM	$ 150.00	15	811	0.16	$ 500.00
	ASHP ECM	$ 150.00	15	546	0.08	$ 500.00
	SEER 14.5 or higher Central AC unit	$ 100.00	18	209	0.15	$ 93.00
	SEER 14.5 or higher Central HP unit	$ 250.00	18	375	0.13	$ 98.00
Res. New Construction	Res New Construction	$ 350.00	20	1,182	0.24	$ 500.00
Appliance Turn-in	Appliance Turn IN Refrig	$ 35.00	7.5	886	0.18	$ -
Program	Appliance Turn IN Freezer	$ 35.00	7.5	503	0.10	$ -
	Appliance Turn IN Room AC	$ 25.00	3	275	0.19	$ -
ENERGY STAR	LED Holiday	$ 3.50	20	9	-	$ 7.50
Products	Room AC E Star	$ 15.00	9	83	0.06	$ 30.00
	Dehumidifier E Star	$ 10.00	12	92	0.07	$ 5.00
	Dishwasher E Star	$ 25.00	11	144	0.03	$ 133.00
	Residential CFL	$ 1.50	9.4	43	-	$ 3.00
	Clothes Washers	$ 50.00	14	165	0.03	$ 200.00

Municipality Name	Lighting Retrofit	New Construction	Cooling Chiller	Motors/ Pumps /VFD	Custom Incentive	Food Service Program	Specialty Measure Program	Targeted Audit Programs Schools	ENERGY STAR Products Program	Residential Lighting Program	Appliance Turn-in Program	Residential HVAC Program	Change A Light- Change the World
Alton Municipal Utilities	x	x	x	x	x	x	x	x	x		x	x	
Denison Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Hartley Municipal Utilities	x	x	x	x	x	x	x		x	x	x	x	x
Hawarden Municipal Utilites	x	x	x	x	x	x	x	x	x	x	x	x	x
Kimballton Municipal Utilities									x	x	x	x	
Lake Park Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Manilla Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Orange City Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Paullina Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Primghar Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Remsen Municipal Utilities	x	x	x	x	x		x	x	x	x	x	x	x
Rock Rapids Municipal Utilities	x	x	x	x	x	x	x		x	x		x	x
Sanborn Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Shelby Municipal Utilities	x		x	x	x	x	x	x	x	x	x	x	x
Sioux Center Municipal Utilities	x	x	x	x	x	x	x	x	x	x	x	x	x
Woodbine Municipal Light and Power	x	x	x	x	x	x	x	x	x	x	x	x	x

Updated 12/30/2009

Budget Estimates by Program By Member By Year

MRES MEMBER UTILITIES	2010 Program Budgets TOTALS Residential	C&I	Total Budget	C&I Programs Prescriptive	Other/Custom	ENERGY STAR
				38.7%	10.7%	15.6%
Alton Municipal Utilities	$ 2,419	$ 2,363	$ 4,782	$ 1,850	$ 513	$ 822
Denison Municipal Utilities	$ 33,250	$ 32,475	$ 65,725	$ 25,428	$ 7,046	$ 10,258
Hartley Municipal Utilities	$ 4,072	$ 3,977	$ 8,049	$ 3,114	$ 863	$ 1,383
Hawarden Municipal Utilites	$ 6,518	$ 6,366	$ 12,885	$ 4,985	$ 1,381	$ 2,214
Kimballton Municipal Utilities	$ 1,036	$ -	$ 1,036			$ 1,036
Lake Park Municipal Utilities	$ 2,486	$ 2,428	$ 4,913	$ 1,901	$ 527	$ 1,614
Manilla Municipal Utilities	$ 1,617	$ 1,579	$ 3,196	$ 1,237	$ 343	$ 1,050
Orange City Municipal Utilities	$ 20,651	$ 20,170	$ 40,821	$ 15,793	$ 4,376	$ 6,371
Paullina Municipal Utilities	$ 2,222	$ 2,170	$ 4,393	$ 1,699	$ 471	$ 755
Primghar Municipal Utilities	$ 1,944	$ 1,899	$ 3,843	$ 1,487	$ 412	$ 660
Remsen Municipal Utilities	$ 3,565	$ 3,482	$ 7,047	$ 2,727	$ 756	$ 1,211
Rock Rapids Municipal Utilities	$ 6,427	$ 6,277	$ 12,703	$ 4,915	$ 1,362	$ 4,173
Sanborn Municipal Utilities	$ 4,665	$ 4,557	$ 9,222	$ 3,568	$ 989	$ 1,585
Shelby Municipal Utilities	$ 2,156	$ -	$ 2,156			$ 2,156
Sioux Center Municipal Utilities	$ 24,109	$ 23,547	$ 47,655	$ 18,437	$ 5,109	$ 7,438
Woodbine Municipal Light and Power	$ 3,333	$ 3,255	$ 6,588	$ 2,549	$ 706	$ 1,132
Total - All Utilities	**$ 120,470**	**$ 114,545**	**$ 235,015**	**$ 89,690**	**$ 24,854**	**$ 43,857**

MRES MEMBER UTILITIES	2011 Program Budgets TOTALS Residential	C&I	Total Budget	C&I Programs Prescriptive	Other/Custom	ENERGY STAR
				38.7%	10.7%	15.6%
Alton Municipal Utilities	$ 4,004	$ 3,910	$ 7,914	$ 3,062	$ 848	$ 1,360
Denison Municipal Utilities	$ 55,024	$ 53,741	$ 108,765	$ 42,080	$ 11,661	$ 16,976
Hartley Municipal Utilities	$ 6,739	$ 6,582	$ 13,321	$ 5,154	$ 1,428	$ 2,289
Hawarden Municipal Utilites	$ 10,787	$ 10,536	$ 21,323	$ 8,250	$ 2,286	$ 3,664
Kimballton Municipal Utilities	$ 1,714	$ -	$ 1,714			$ 1,714
Lake Park Municipal Utilities	$ 4,113	$ 4,017	$ 8,131	$ 3,146	$ 872	$ 2,671

Budget Estimates by Program By Member By Year

MRES MEMBER UTILITIES	2010 Program Budgets TOTALS Residential	C&I	Total Budget	C&I Programs Prescriptive	Other/Custom	ENERGY STAR
				38.7%	10.7%	15.6%
Manilla Municipal Utilities	$ 2,676	$ 2,614	$ 5,290	$ 2,047	$ 567	$ 1,738
Orange City Municipal Utilities	$ 34,175	$ 33,378	$ 67,553	$ 26,136	$ 7,242	$ 10,544
Paullina Municipal Utilities	$ 3,677	$ 3,592	$ 7,269	$ 2,812	$ 779	$ 1,249
Primghar Municipal Utilities	$ 3,217	$ 3,142	$ 6,359	$ 2,460	$ 682	$ 1,093
Remsen Municipal Utilities	$ 5,900	$ 5,763	$ 11,663	$ 4,512	$ 1,250	$ 2,004
Rock Rapids Municipal Utilities	$ 10,635	$ 10,387	$ 21,022	$ 8,133	$ 2,254	$ 6,905
Sanborn Municipal Utilities	$ 7,721	$ 7,541	$ 15,261	$ 5,904	$ 1,636	$ 2,622
Shelby Municipal Utilities	$ 3,568	$ -	$ 3,568			$ 3,568
Sioux Center Municipal Utilities	$ 39,897	$ 38,966	$ 78,863	$ 30,511	$ 8,455	$ 12,309
Woodbine Municipal Light and Power	$ 5,516	$ 5,387	$ 10,903	$ 4,218	$ 1,169	$ 1,873
Total - All Utilities	**$ 199,362**	**$ 189,555**	**$ 388,917**	**$ 148,425**	**$ 41,130**	**$ 72,578**

MRES MEMBER UTILITIES	2012 Program Budgets TOTALS Residential	C&I	Total Budget	C&I Programs Prescriptive	Other/Custom	ENERGY STAR
				38.7%	10.7%	15.6%
Alton Municipal Utilities	$ 6,425	$ 6,276	$ 12,701	$ 4,914	$ 1,362	$ 2,182
Denison Municipal Utilities	$ 88,309	$ 86,250	$ 174,558	$ 67,535	$ 18,715	$ 27,245
Hartley Municipal Utilities	$ 10,815	$ 10,563	$ 21,378	$ 8,271	$ 2,292	$ 3,673
Hawarden Municipal Utilites	$ 17,312	$ 16,909	$ 34,221	$ 13,240	$ 3,669	$ 5,880
Kimballton Municipal Utilities	$ 2,751	$ -	$ 2,751			$ 2,751
Lake Park Municipal Utilities	$ 6,602	$ 6,448	$ 13,049	$ 5,049	$ 1,399	$ 4,286
Manilla Municipal Utilities	$ 4,295	$ 4,195	$ 8,490	$ 3,285	$ 910	$ 2,789
Orange City Municipal Utilities	$ 54,847	$ 53,569	$ 108,416	$ 41,945	$ 11,623	$ 16,922
Paullina Municipal Utilities	$ 5,902	$ 5,764	$ 11,666	$ 4,514	$ 1,251	$ 2,005
Primghar Municipal Utilities	$ 5,163	$ 5,043	$ 10,206	$ 3,949	$ 1,094	$ 1,754
Remsen Municipal Utilities	$ 9,469	$ 9,248	$ 18,717	$ 7,242	$ 2,007	$ 3,216
Rock Rapids Municipal Utilities	$ 17,068	$ 16,670	$ 33,739	$ 13,053	$ 3,617	$ 11,082

Budget Estimates by Program By Member By Year

	2010 Program Budgets				C&I Programs			
MRES MEMBER UTILITIES	**TOTALS**				**Prescriptive**	**Other/Custom**		**ENERGY STAR**
	Residential	**C&I**	**Total Budget**		**38.7%**	**10.7%**		**15.6%**
Sanborn Municipal Utilities	$ 12,391	$ 12,102	$ 24,493		$ 9,476	$ 2,626		$ 4,209
Shelby Municipal Utilities	$ 5,726	$ -	$ 5,726					$ 5,726
Sioux Center Municipal Utilities	$ 64,030	$ 62,538	$ 126,568		$ 48,968	$ 13,570		$ 19,755
Woodbine Municipal Light and Power	$ 8,852	$ 8,646	$ 17,498		$ 6,770	$ 1,876		$ 3,007
Total - All Utilities	**$ 319,958**	**$ 304,219**	**$ 624,177**		**$ 238,209**	**$ 66,010**		**$ 116,481**

Budget Estimates by Program By Member By Year			
	Residential Programs		
MRES MEMBER UTILITIES	Appliance Turn-In	HVAC	New Construction
	15.7%	17.7%	1.6%
Alton Municipal Utilities	$ 749	$ 848	
Denison Municipal Utilities	$ 10,295	$ 11,661	$ 1,035
Hartley Municipal Utilities	$ 1,261	$ 1,428	
Hawarden Municipal Utilites	$ 2,018	$ 2,286	
Kimballton Municipal Utilities			
Lake Park Municipal Utilities		$ 872	
Manilla Municipal Utilities		$ 567	
Orange City Municipal Utilities	$ 6,394	$ 7,243	$ 643
Paullina Municipal Utilities	$ 688	$ 779	
Primghar Municipal Utilities	$ 602	$ 682	
Remsen Municipal Utilities	$ 1,104	$ 1,250	
Rock Rapids Municipal Utilities		$ 2,254	
Sanborn Municipal Utilities	$ 1,445	$ 1,636	
Shelby Municipal Utilities			
Sioux Center Municipal Utilities	$ 7,465	$ 8,455	$ 751
Woodbine Municipal Light and Power	$ 1,032	$ 1,169	
Total - All Utilities	**$ 33,053**	**$ 41,131**	**$ 2,428**
	Residential Programs		
MRES MEMBER UTILITIES	Appliance Turn-In	HVAC	New Construction
	15.7%	17.7%	1.6%
Alton Municipal Utilities	$ 1,240	$ 1,404	
Denison Municipal Utilities	$ 17,037	$ 19,298	$ 1,713
Hartley Municipal Utilities	$ 2,087	$ 2,363	
Hawarden Municipal Utilites	$ 3,340	$ 3,783	
Kimballton Municipal Utilities			
Lake Park Municipal Utilities		$ 1,443	

Budget Estimates by Program By Member By Year			
	Residential Programs		
MRES MEMBER UTILITIES	Appliance Turn-In	HVAC	New Construction
	15.7%	17.7%	1.6%
Manilla Municipal Utilities		$ 939	
Orange City Municipal Utilities	$ 10,582	$ 11,985	$ 1,064
Paullina Municipal Utilities	$ 1,139	$ 1,290	
Primghar Municipal Utilities	$ 996	$ 1,128	
Remsen Municipal Utilities	$ 1,827	$ 2,069	
Rock Rapids Municipal Utilities		$ 3,730	
Sanborn Municipal Utilities	$ 2,391	$ 2,708	
Shelby Municipal Utilities			
Sioux Center Municipal Utilities	$ 12,353	$ 13,992	$ 1,242
Woodbine Municipal Light and Power	$ 1,708	$ 1,934	
Total - All Utilities	**$ 54,699**	**$ 68,066**	**$ 4,019**
	Residential Programs		
MRES MEMBER UTILITIES	Appliance Turn-In	HVAC	New Construction
	15.7%	17.7%	1.6%
Alton Municipal Utilities	$ 1,990	$ 2,253	
Denison Municipal Utilities	$ 27,343	$ 30,971	$ 2,749
Hartley Municipal Utilities	$ 3,349	$ 3,793	
Hawarden Municipal Utilites	$ 5,360	$ 6,072	
Kimballton Municipal Utilities			
Lake Park Municipal Utilities		$ 2,315	
Manilla Municipal Utilities		$ 1,506	
Orange City Municipal Utilities	$ 16,983	$ 19,236	$ 1,707
Paullina Municipal Utilities	$ 1,827	$ 2,070	
Primghar Municipal Utilities	$ 1,599	$ 1,811	
Remsen Municipal Utilities	$ 2,932	$ 3,321	
Rock Rapids Municipal Utilities		$ 5,986	

Budget Estimates by Program By Member By Year			
	Residential Programs		
MRES MEMBER UTILITIES	Appliance Turn-In	HVAC	New Construction
	15.7%	17.7%	1.6%
Sanborn Municipal Utilities	$ 3,837	$ 4,346	
Shelby Municipal Utilities			
Sioux Center Municipal Utilities	$ 19,826	$ 22,456	$ 1,993
Woodbine Municipal Light and Power	$ 2,741	$ 3,105	
Total - All Utilities	**$ 87,786**	**$ 109,240**	**$ 6,450**

Estimated kWh Savings by Program by Year

	Estimated Annual kWh Savings				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Program	**2010**	**2011**	**2012**	**2013**	**2014**
C&I Lighting	797,092	1,323,173	2,130,308	2,364,642	2,601,106
C&I Cooling/Chiller	29,197	48,468	78,033	107,528	155,236
C&I Motors/Pumps/VFD	47,712	79,202	127,515	141,542	155,891
C&I Custom & New Construction					
and Targeted Audits	226,721	376,219	605,584	672,175	739,371
C&I Food Service	5,780	9,594	15,447	19,962	25,370
C&I Specialty Equipment	17,809	29,563	47,597	52,833	58,116
Residential HVAC	89,662	147,943	236,709	267,481	296,904
Residential New Construction	7,502	12,378	19,804	22,379	24,840
Residential Appliance Turn-in	176,286	290,872	465,396	525,897	583,746
ENERGY STAR Products	260,545	429,899	687,839	777,258	862,756
Totals	**1,658,306**	**2,747,311**	**4,414,232**	**4,951,697**	**5,503,336**

Appendix 9

City of Ames Electric Department
Supplemental Information

Statement of Commitment

Ames is committed to Smart Energy and has the full support if the Mayor, City Manager, and the City Council. The citizens of Ames actively participate in the program. Smart Energy has been nationally recognized by the American Public Power Association and the Peak Load Management Alliance winning awards from both organizations in 2009. The City understands Smart Energy is a long term proposition and looks forward to realizing over $20 million in future avoided cost savings and the reduction of approximately 20 MW in demand over its program life. For more information about Smart Energy visit www.cityofames.org/smartenergy or call 515-239-5177.

Program Overview

In 2007 the City of Ames Electric Services took an important step in controlling peak by creating Smart Energy. Smart Energy provides energy education and incentives aimed at reducing peak electric demand, saving energy, improving efficiency, and conserving resources. Smart Energy is a comprehensive approach to reducing demand in all customer segments.

The City of Ames has actively engaged in saving resources, reducing energy demand, and promoting recycling. In recent years we have witnessed a growing movement in the Ames community to promote conservation of limited resources as a means to achieving a greater global good – a more sustainable future.

With support from the Ames City Council, Mayor Ann Campbell joined mayors from across the country in signing the U.S. Mayors' Climate Protection Agreement. Part of signing the agreement involves understanding energy usage, collecting data about energy management, recycling, waste reduction, transportation, and land use.

EcoSmart is the City of Ames' marketing plan to capture all City of Ames conservation efforts. While many of these efforts are new, others have been around for decades. We are fortunate to have a truly comprehensive approach to conservation, green energy, and sustainability in Ames. Programs under the EcoSmart umbrella are Smart Energy, Smart Trash, Smart Water, Smart Ride, and Smart Watersheds. For more information on EcoSmart visit www.cityofames.org and follow the EcoSmart link.

Smart Energy offers a dozen programs that provide energy management assistance in four areas, education, green energy access, load management, and demand side management. Current programs are:

Power Watch – An energy education and call to action program. Check out the Power Watch gauge on the City's main website at www.cityofames.org.
Green Choices – Currently accepts donations for installation of green energy resources, but will evolve into a purchase program when renewable energy becomes available.
Prime Time Power –A load management program that offers a $20 per summer bill credit for the ability to interrupt a central air conditioner during summer peak season.
Power Factor Rebate – A rebate to help large commercial customers install power factor correction equipment improving reliability and reducing electricity use.
Air Conditioner Rebate – A rebate to help customers install efficient central air conditioners or heat pumps.
Commercial Lighting Rebate – A rebate for commercial customers to help them install efficient lighting.
Residential Lighting Rebate – A rebate for commercial customers to help them install efficient lighting.
Efficient Appliance Rebate – A rebate to help customers purchase efficient refrigerators, freezers, dishwashers, and washing machines.
New Construction Rebate – A rebate available for anyone building a new home to Energy Star specifications.
Residential Energy Audit – An energy audit and blower door test to help homeowners understand their current level of efficiency and what they can do to improve it.
Commercial Audit – Various types of audits for commercial customers helping them understand things such as their energy usage, energy tax deferral status, lighting requirements, and efficiency.
Commercial/Industrial Custom Rebate – A rebate for any change resulting in the saving of electric energy and reducing electric demand.

Appendix 10

Cedar Falls Utilities
Supplemental Report on Energy Efficiency Goals, Measures, Cost-Effectiveness
Appendix 10.1 Narrative
Appendix 10.2 Analysis (provided as Excel file CFU Cost-Effectiveness Analysis.xlsx)

Energy Efficiency Plan

2010-2012

CEDAR FALLS UTILITIES

The Power of Service.

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Part I: Introduction and Report Format

Cedar Falls Utilities provides electricity, natural gas, water, and high speed internet and cable television services to an area with more than 37,000 people in northeast Iowa. Since the 1970s, CFU has offered a variety of demand-side management programs and services aimed at educating customers about energy and ways to reduce their energy usage.

CFU is committed to providing energy efficiency programs that meet the needs of all of its customers, regardless of customer rate class, customer size, rural or urban location, type of energy efficiency project, customer income level, and type of building served. The programs described below are a major expansion of CFU's demand-side management programs. Although CFU's performance goals are officially set for 2012, CFU has also provided 2010 budget and cost-effectiveness information and has set unofficial performance goals for 2010 and 2011. CFU believes this will better enable it to track its progress towards meeting its 2012 goals and will provide context for the Iowa Utilities Board, the Office of Energy Independence and other interested regional and state entities, about the programs that have been in long operation at CFU. Between 2010 and 2012, CFU will continue to revise current program offerings and eligibility rules in order to provide up-to-date and expanded opportunities for CFU and its customers to manage energy costs.

In order to set these goals, CFU relied heavily on both statewide and local resources. CFU used a study commissioned by the Iowa Association of Municipal Utilities (IAMU) to assess technical and economic energy savings potential for CFU and to attain general and initial estimates of achievable potential for CFU. CFU then used a variety of local resources to fine tune these initial estimates of achievable potential into more specific estimates of achievable potential given CFU's specific service territory and past program offerings. These additional resources included analyzing past energy efficiency program data, cataloging all energy efficiency programs currently offered by distinct CFU departments, conducting field interviews with local trade allies, surveying CFU retail customers, conducting a literature review of various other assessments of potential conducted in Iowa and elsewhere in the United States, and using customer demographic information to further identify market segments and building stock with the highest level of energy savings potential.

It is assumed the reader has familiarity with the processes traditionally used in utility assessments of energy efficiency potential. CFU's working definitions of technical, economic, and achievable potential are included in Appendix 1 at the end of this report, along with a few other terms. For further description of the general processes used in CFU's assessment of potential, please consult the report that IAMU conducted for its members and the IAMU joint filing. The report commissioned by IAMU is *Energy Efficiency and Demand Response Potential for Iowa Municipal Utilities,* which was completed in June 2009 by the Energy Center of Wisconsin (ECW). CFU references the ECW report throughout the remainder of its filing; the ECW report and appendices are included as part of the IAMU joint municipal filing.

The remainder of CFU's report includes four principal components:

1. Basic information to comply with Iowa Code §476.6, Subsection 16, Paragraph c
    a. CFU's cost-effective energy efficiency goals

   b. Measure descriptions and projected costs
   c. Cost-effectiveness analysis of each measure

2. A description of additional analyses conducted, factors identified, and adjustments made by CFU that impact CFU's achievable potential.

3. Explanation of current and planned energy efficiency programs, energy code enforcement assistance, and low-income, tree, and education and outreach programs.

4. Appendices with background information relevant to CFU's filing and programs, including CFU's obligations as outlined in Iowa Code §476.6, Subsection 16, Paragraph c.

Those with questions about CFU's energy efficiency programs should contact Erin Buchanan (ebuchanan@cfunet.net or 319-268-5427), Pete Olson at polson@cfunet.net (319-268-5355) or Steve Bernard at sbernard@cfunet.net.

Part II: Compliance with Iowa Code §476.6

NOTE: The entire Iowa Code §476.6, Subsection 16, Paragraph c is included in Appendix I in Section V. For an explanation of the process and factors used in setting the goals, please consult Section III.

Part a. Cost Effective Energy Efficiency Goals and Historical Program Data

CFU has established cost-effective kWh and MCF efficiency goals for 2010-2012, as well as a summary of program impacts from recent years. Because CFU does not actively offer direct load control programs, CFU will not include a cost-effective kW (or peak capacity) goal for 2012 in this report to the Iowa Utilities Board. As per Iowa Code §476.6, CFU also reserves the right to make updates or amendments to its plan and goals in future years.

Figure 1. Projected Annual Energy Goals and Percent of Sales Data, 2010-2012

	2010	2011	2012
Average Retail Sales - 3 prior years (kWh)	455,328,000	459,353,333	468,900,667
Average Retail Natural Gas Sales – 3 years prior (MCF)	1,748,815	1,735,974	1,652,053
CFU Electric Goal (kWh)	2,731,968	3,445,150	4,220,106
CFU Electric Goal as a % of Retail Electric Sales	0.60%	0.75%	0.90%
CFU Natural Gas Goal (MCF)	8,919	10,416	10,738
CFU Natural Gas Goal as a % of Retail NG Sales	0.51%	0.60%	0.65%

Figure 2. Annual Energy Savings and Percent of Sales Data, 2007-2009

	2007*	2008**	2009 (Estimated Totals)**
Reported Annual NG Savings (MCF)*	7,559	4,455**	6,356**
Reported Annual Electric Savings (kWh)	1,063,943	1,302,000**	2,084,000**
NG Savings as a % of Prior Three Years Average Retail Sales	0.49%	0.30%**	0.40%**
Electric Savings as a % of Prior 3 Years' Average Retail Sales	0.26%	0.30%**	0.47%**

*Reported on EEP-08-6, filed by IAMU on August 29, 2008 with the Iowa Utilities Board.

**CFU estimates of annual program impacts; final report on activities will be made to Iowa Utilities Board in July 2010, as per IUB rules [199 IAC Chapter 36].

Part b. Measure Descriptions and Projected Costs

As described in Part III, CFU used a variety of resources to comply with this requirement. Below is a description of the locations of different measure descriptions and projected costs:

Customer Segment	Measure Description Location	Projected Cost Location
Residential	"CFU Cost-Effectiveness Analysis.xls" and Part IV	"CFU Cost-Effectiveness Analysis.xls"
Nonresidential	Measure descriptions filed by IAMU in the joint municipal filing and in ECW Assessment of Potential and Part IV	"CFU Cost-Effectiveness Analysis.xls" and data provided by IAMU in the joint municipal filing and ECW Assessment of Potential

In addition to the descriptions above, CFU also presents a summary of its 2010 projected costs for its natural gas and electric energy efficiency programs. Because CFU is new to the process of setting energy savings goals, CFU will publish future budgets as it stabilizes costs associated with offering new programs in 2010 and additional new programs beyond 2010, particularly in the nonresidential sector.

Figure 3. 2010 Estimated Budgets by Function

Cost Categories	Electric	Natural Gas	Total
Administration	$141,564	$34,937	**$176,501**
Marketing/Program Delivery	$330,178	$129,050	**$459,228**
Customer Incentives/Lost Interest	$384,808	$163,448	**$548,256**
On-Bill Financing Fund*	$670,000	$400,000	**$1,070,000**
Other (Assessments, Code Enforcement Assistance, Trees)	$54,000	$52,000	**$106,000**
Totals (including financing)	**$1,580,550**	**$779,435**	**$2,359,985**
Totals (without financing)	**$910,550**	**$379,435**	**$1,289,985**

*These are CFU ratepayer funds that the CFU Board of Trustees has specifically designated for CFU to provide zero-interest financing directly to residential customers who participate in qualifying CFU rebate programs.

CFU has historically had high administrative and delivery costs when compared directly to other Iowa utilities (OCA, 2009). CFU believes several factors may be responsible, including but not limited to:

- **Types of programs offered may differ:** Many utilities across Iowa offer different programs; for example, CFU offers some residential programs that are nontraditional, customized, or educational in nature (i.e., energy code enforcement assistance, residential HVAC sizing calculations, zero-interest financing, and advanced diagnostic services). Additionally, CFU does not currently offer direct load control or other demand response programs.

- **The definitions and types of cost categories may differ:** For example, whether costs associated with audits and advanced diagnostic services are included as incentive costs or as "non-incentive" costs impacts CFU's proportion of total expenditures that are spent on incentives (ECW, 2009).

- **Delivery methods may differ:** The majority of CFU's funding is spent on staff, trade allies, and energy efficiency products and materials that are located within the City of Cedar Falls and the Cedar Valley area. CFU prioritizes using local resources where possible and practical to deliver energy services to its customers.

Part c. Cost-Effectiveness of Each Measure

In the file called "CFU Cost-Effectiveness.xls", CFU submits an analysis of cost-effectiveness for each measure included in this filing. In addition to an analysis of cost-effectiveness for each measure, CFU also submits an estimate of the total cost-effectiveness of its electric and natural gas portfolios for 2010.

Figure 4. 2010 Portfolio Cost-Effectiveness

Cost Categories	Electric	Natural Gas	Total
NPV of Benefits	$2,896,604	$910,796	$3,807,400
NPV of Costs	$1,977,829	$756,539	$2,734,368
Societal B/C Test	1.46	1.20	1.39

Part III: Assessment of Potential for Cedar Falls Utilities

Summary of Resources and Factors

ECW Assessment of Potential

CFU used a study commissioned by the Iowa Association of Municipal Utilities to identify high level cost-effective energy savings potential opportunities in Iowa. IAMU commissioned the Energy Center of Wisconsin (ECW) to complete the study entitled *Energy Efficiency and Demand Response Potential for Iowa Municipal Utilities* in June 2009. The study was an inaugural assessment of technical, economic, and achievable potential for more than 150 distinct municipal electric, natural gas, and propane utilities serving separate and mutually exclusive areas across the entire state of Iowa.

Cedar Falls Utilities (CFU) believes it is challenging to conduct an inaugural assessment of technical, economic, and achievable potential for a single utility, much less for more than 150 Iowa utilities. CFU therefore commends IAMU for the service they have provided their members with this assessment; it is a very useful and valuable resource that assisted CFU in estimating technical potential, economic potential, and achievable potential in order to comply with Iowa Code §476.6, Subsection 16, Paragraph c. CFU would not have been able to assess its potential or set energy efficiency goals without this study. However, because of CFU's long history of offering energy efficiency programs, CFU differs from many of the other Iowa municipal utilities that were included in the ECW study, because many of the most easily achieved, "low-hanging fruit" energy efficiency projects have already been implemented in CFU's service territory, most notably in the residential sector. Additionally some demographic factors, including rates of residential new construction and the types of industrial customers, differ from many of the other municipal utilities in the ECW study.

Because of these factors, CFU used a few resources in addition to the ECW study to fine tune and customize the estimates of CFU's achievable energy efficiency potential that were included in the ECW study. These resources are described below in the section "CFU Supplemental Research". Additionally, the glossary of terms located in Appendix 1 in Section V lists CFU's definitions of achievable, technical, and economic potential.

CFU Supplemental Research

To supplement the initial estimates from the ECW study, CFU utilized a variety of additional resources. These are described below:

- ***Survey of Residential Retail Customers:*** Energy efficiency and demographic questions were included in CFU's annual residential customer satisfaction survey in an attempt to summarize several consumer behavior patterns regarding energy efficiency, particularly among homeowners in the City of Cedar Falls. Results from relevant parts of the analysis are included and described in more detail in Appendix 4.

- ***Analysis of past programs offered and program participation levels:*** CFU reports on energy efficiency program activity reports for 2007 and later years were categorized more specifically

by measure type, customer type, and fuel service type in order to better understand trends in participation levels. Data from years prior to 2007 was also used when possible to estimate participation levels in CFU's long-term residential energy efficiency rebate programs.

- ***Cataloging of all Currently Offered CFU Services that Encourage Customer Efficiency:*** Since CFU offers electric, natural gas, water, and communications services through four separate utilities, several CFU departments have independently administered comprehensive customer service packages which partially involved energy efficiency. These services include CFU's annual furnace inspections offered by the Division of Gas Operations, shade tree planting and holiday lighting recycling offered by the Marketing Department, and rebate programs and inspection services through the Energy Services department. Cataloging these resources helped CFU identify areas for potential future programs, estimate total activities, and prevent potential duplication of energy efficiency services between utilities.

- ***Literature Review:*** CFU conducted a small literature review of existing Midwestern and municipal utility studies and regulatory reports in order to benchmark achievable potential estimates and best practices at other Midwestern and municipal utilities in the last 5-10 years. The literature included in this analysis is referenced throughout the report; resources used have been listed in Appendix 3.

- ***Field interviews with technical experts and local trade allies***: After the completion of the ECW study, CFU conducted qualitative screening of the residential measures which passed the societal cost-effectiveness test used in determination of economic potential. This phase included a meeting with staff from the Iowa Energy Center, discussions with a team of UNI graduate students who researched attitudes of local small commercial customers regarding energy efficiency, and discussions with several of CFU's trade allies and other community resources about the availability of different energy saving technologies and equipment and needs. Feasibility screening is summarized further in Appendix 3.

- ***Identification of other relevant demographic data***: In 2009, CFU consulted with a variety of local resources, including various departments within the City of Cedar Falls, Black Hawk County, and the University of Northern Iowa. Demographic information from resources from the Iowa Utilities Board, Energy Information Administration, and other sources were. The objective of this research was to develop the following additional information:
    - Identification of SIC and NAICS codes for large customers, in order to identify commercial programs and technologies that best meet the needs of these customers.
    - Profiling of residential building permits in Cedar Falls since 2000, in order to estimate existing levels of single family and multifamily housing stock in the CFU service territory and estimate rates of new construction.
    - Identification of any other major factors impacted energy efficiency implementation at small nonresidential customers.

- Better identification of CFU customers located in other Iowa counties and areas outside City of Cedar Falls limits.

Global Administrative Inputs

These administrative assumptions were used in benefit-cost calculations for both electric and natural gas measures and for residential, commercial, and industrial customer sectors.

Achievable Scenario	$/kWh	$/therm
Discount Rate	5.00%	5.00%
Societal B/C Test Screen Value	1.00	1.00

Avoided Cost Inputs

Natural gas: In 2009 CFU updated the ECW estimates of avoided natural gas costs based on DEMARC and NYMEX data, in order to reflect drops in natural gas supply costs since August 2008.

Electric: The costs used are derived from the ECW study, which used forecasts of MISO LMP prices. More details are available in Appendix A of the ECW study.

Federal CO_2 Standards: There is currently significant uncertainty regarding the final form and timeline of actual carbon cost legislation and its quantifiable impacts on CFU. However, CFU believes that it is reasonable that some policy will be enacted during the time frame covered by this assessment and cost-effectiveness analyses, which will result in tangible increases in some of CFU's supply costs. In their assessment of potential for Iowa municipals, ECW conducted a sensitivity analysis with $30 per ton of CO_2 emitted added to the standard avoided electric costs and natural gas avoided costs. According to ECW, this is approximately $0.0235/kWh and $0.18/therm.

CFU has opted to use this sensitivity case as its default case for its electric and natural gas avoided costs. As a result, some technologies and equipment that failed the societal cost-effectiveness threshold in the ECW base case passed cost-effectiveness screening under this sensitivity case.

Figure 5. Avoided Costs Used in CFU's Assessment of Potential

Avoided Costs	Summer Peak	Summer Off Peak	Winter Peak	Winter Off-Peak
Electricity ($/kWh)	$0.069	$0.032	$0.064	$0.0350
Capacity ($/kW-yr)		$33.00		$33.00
Electric Cost Adders for Societal Test ($/kWh)	$0.0069	$0.0032	$0.0064	$0.0035
Natural Gas ($/therm)	$0.84	$0.84	$0.92	$0.92
Natural Gas Cost Adders for Societal Test ($/therm)	$0.063	$0.063	$0.069	$0.069
Emissions Costs (Electric) ($/kWh)	$0.0235	$0.0235	$0.0235	$0.0235
Emissions Costs (Gas) ($/therm)	$0.1800	$0.1800	$0.1800	$0.1800

General Challenges and Opportunities

Challenge and Opportunity: Laws, Codes, Standards, and Funding Opportunities Add Uncertainty to Estimates of Economic and Achievable Savings Potential

The ECW screening of economic and achievable potential was conducted without the incorporation of many of the recent or upcoming changes in laws, codes, and standards, and funding opportunities from the following sources, many of which were not available at the time the assessment was conducted:

- Some Department of Energy rules and standards
- Iowa's adoption of the 2009 International Energy Conservation Code and ASHRAE 90.1 (2007) for 2010
- Some NEMA Premium Motor standards
- Recent adjustments to ENERGY STAR Standards and CEE Tiers
- AHRI Codes
- Extension/modification of federal tax credits for renewable energy
- Funding resources from the American Recovery & Reinvestment Act or future federal/state stimulus funds that encourage energy efficiency and distributed renewable energy projects in Iowa
    - Iowa Office of Energy Independence's State Energy Efficient Appliance Rebate Program

Some of these impacts, such as funding resources from the Iowa Office of Energy Independence, will likely increase customer participation in energy efficiency programs and increase CFU's achievable potential. However, other standards, such as the adoption of more stringent state and local codes,

decrease the amount of potential remaining. The ECW study alludes to this on page 14, where it notes that potential for CFL savings decreases from 22 GWh in 2012 to 0 GWh in 2018 due to new federal standards.

Challenge: Recognizing CFU's efforts to promote and enforce residential new construction energy codes

CFU assists the City of Cedar Falls with energy code enforcement by conducting insulation and air sealing inspections on new small commercial and residential properties and additions in the community. As noted in the ECW study, it is conventional practice in efficiency potential study estimates not to count naturally-occurring efficiency improvements, such as established state or local codes and federal equipment efficiency standards. ***CFU challenges the assumption of whether residential energy code enforcement is a naturally-occurring process throughout Iowa.*** CFU believes its inspection assistance efforts increases the savings actually realized in the residential new construction sector for much of the CFU service territory, when compared to many other parts of Iowa.

In addition to current efforts in Iowa, the impact of codes and standards on utility programs is an issue in other states and even nationally (IEE, 2009). In California, investor-owned utilities are allowed to claim up to 50% of savings from code improvements based on an agreed-upon formula between regulators and utilities. Additionally, a recent assessment of natural gas savings potential in MN (Navigant, 2009) also recommended that that the MN gas utilities in its study should work with codes and standards groups to develop a program that can allow for some attribution of utility savings.

CFU has historically counted associated expenditures and costs in its Iowa Utilities Board energy efficiency plans, because CFU believes this program is critical to promoting correct and efficient building practices in 100% of residential and small commercial new construction and qualified improvements located within city limits. However, in direct comparisons with program cost and savings data with other Iowa utilities, CFU traditionally has been identified as having higher administrative costs than other utilities, in part because CFU's costs also include the costs of code enforcement assistance. This year CFU has separated the costs estimated with enforcement assistance from the administrative and delivery costs for its other energy efficiency rebate programs, but still includes them in its overall plan.

Challenge: Few new natural gas technologies, decrease in avoided gas costs, and flat/decreasing natural gas consumption in CFU service territory are obstacles to natural gas energy efficiency goals.

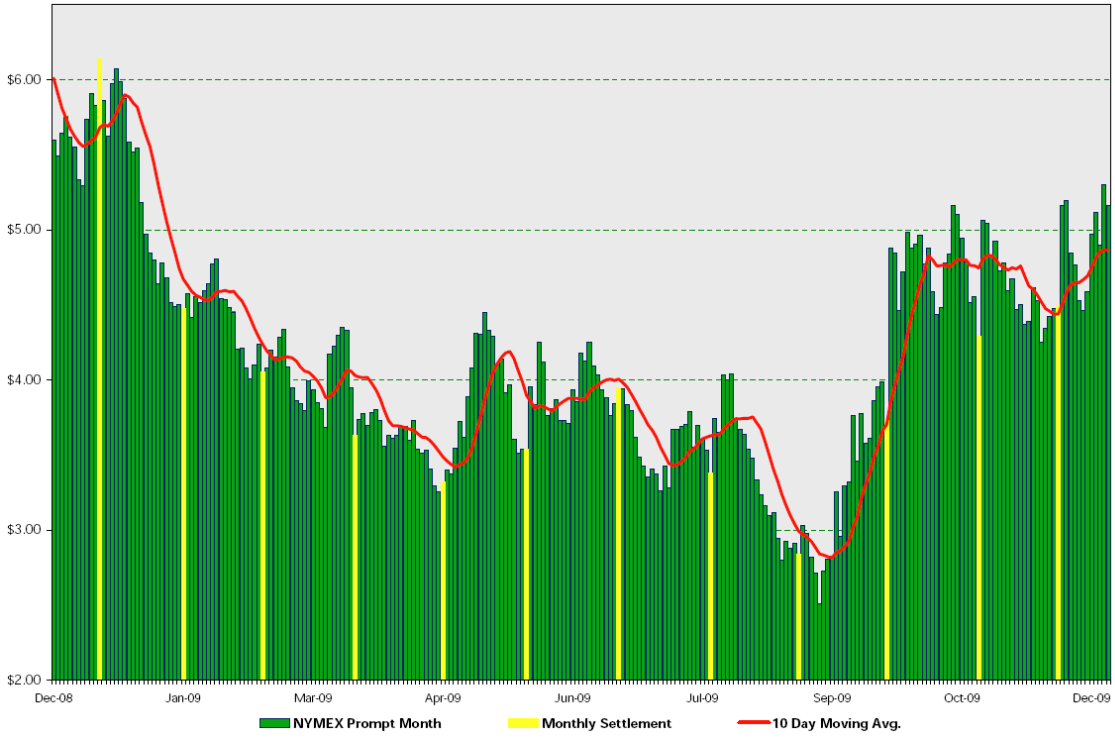
Other natural gas suppliers in Iowa have indicated that the lack of new natural gas technologies present a challenge for their natural gas energy efficiency programs (IPL, 2009). Additionally, CFU's usage per residential customer has decreased since 1990:

Figure 6. Recent CFU Gas Sales Data

Year	# of Res. Customers	Annual Retail Sales to Residential Customers (MCF)	MCF/Res. Customer	Annual Heating Degree Days
1990	9,280	966,977	104.2	7,406
2000	10,576	946,301	89.5	5,760
2007	11,653	788,195	67.6	5,325

Since 2008 the price of natural gas has displayed significant volatility; this also may impact the cost-effectiveness of natural gas measures and the willingness of customers to participate in natural gas efficiency programs. A graph of the volatility in 2009 is shown below:

Figure 7. NYMEX – Front Month Natural Gas Price



Source: www.bpgasandpower.com

Challenge and Opportunity: CFU rural residential and farm customers

CFU has service territory beyond the city limits of Cedar Falls, including parts or all of the following townships and areas:

County	Townships Served
Black Hawk	Black Hawk, Cedar Falls, Mt. Vernon, Union, Washington
Butler	Beaver
Grundy	Fairfield, Grant

As of July 2009, CFU had 794 rural residential customers, which is slightly over 5% of all residential electric accounts. Over 80% of these customers use propane as their primary fuel for heat and/or water heating. Additionally, of CFU's almost 250 farm customers, many are not eligible for USDA financing. As outlined further in the sections "Residential Assessment of Potential – Specific Factors and Adjustments" and "Nonresidential Assessment of Potential – Specific Factors and Adjustments", CFU faces new challenges and new opportunities for providing energy efficiency programs to these customers.

Challenge: CFU's small number of industrial and other large energy users adds to uncertainty in the goal-setting process.

CFU's proportion of residential load is larger than many of the other largest municipal utilities, RECs, and investor-owned utilities in Iowa. In 2008 it actually sold more residential MWHs than any other municipal utility in Iowa, but was only the 9th largest in terms of industrial retail sales. Direct comparisons with many of Iowa's other utilities is made directly below and also in the section "Nonresidential Assessment of Potential – Specific Factors and Adjustments", in order to provide additional context about CFU's industrial sector.

Interstate Power and Light noted in a recent settlement update (IPL, 2009) that it had 1,116 customers who have more than $100,000 in retail natural gas and/or electric sales from IP&L and who have an assigned strategic account manager. In contrast, CFU has approximately 22 such customers (a few of these customers have more than one account exceeding these thresholds).

	Interstate Power & Light[1]	CFU
Number of accounts generating $100,000 or more in annual (electric and/or natural gas) utility revenue and who have an assigned strategic account manager	1,116	22

[1] IPL, (2009). *Update on 2009-2013 Energy Efficiency Plan Settlement Items – Industrial Savings Potential.*

Additionally, in a recently filed operating plan, MidAmerican provided estimates of the number of customers meeting certain size thresholds. In order to provide context about its size and achievable savings potential, CFU provides comparison data below.

	MidAmerican Energy[2]	CFU
Number of customers/plants with a minimum peak demand of 2 MW or greater	96-115	3

Since many of the greatest lost opportunities and most cost-effective energy efficiency projects are in the commercial and industrial sectors (*RDEE, October 2009)*, this presents a challenge in the size and determination of CFU's cumulative achievable potential. CFU is committed to aggressively ramping up and expanding its current nonresidential offerings over coming years. However, CFU believes presenting supplemental evidence about its size helps present context and understanding about its specific service territory. ***There may be years in the future where no significant efficiency projects at CFU's large customers take place.*** Meeting some efficiency goals during those years may potentially present a challenge for CFU.

An additional table is included in the Section "Nonresidential Assessment of Potential", which allows for a further comparison of the sizes of customer classes between many of Iowa's utilities.

Opportunity: CFU's high amount of small commercial customers

Since many of CFU's past programs have not as aggressively targeted commercial customers in the CFU service territory, there are more "low-hanging fruit" projects, particularly in the small commercial lighting, motors, and refrigeration sectors. As outlined in Part III, CFU's future programs will provide more options for these customers.

[2] MidAmerican (2009). Energy Efficiency Operating Plan, EEP-08-2, pages C3-4, C3-9, and C5-14.

Residential Assessment of Potential – Specific Factors and Adjustments

CFU estimates the following amount of potential in the residential sector:

Figure 8. 2012 Residential Economic and Achievable Potential

Potential	Electric	Natural Gas
Baseline Forecast (GWh or ccf)	176.22	8,098,280
Economic Potential (GWh or ccf)	55.08	1,827,693
Achievable Potential, 2012 (GWh or ccf)	2.02	50,516

CFU has also made the following specific modifications and comments regarding the ECW assessments of economic and achievable savings residential potential.

Factor 1: Used local demographic and sales data to adjust global assumptions of CFU's new construction levels and market segment distributions.

Figure 9. Residential Market Segment Breakdown

Residential Market Segment Breakdown	CFU Estimate	ECW Study Estimate
Single Family Homeowner	55.0%	62.4%
Small rental (1 to 4 households)*	29.1%	20.5%
Large rental (5 or more households)*	10.8%	12.7%
Manufactured Homes	5.1%	4.4%

*CFU also included multi-family homeowners in the categories small rental (1 to 4 households) and large rental (5 or more households), as their building prototypes more accurately match small rental (1 to 4 households) and large rental building prototypes than a single-family home.

Figure 10. Residential New Construction Rates Used in Bottom-Up Assessment of Residential Potential

Annual Rates of New Construction	ECW Study Estimates	CFU Study Estimates
Residential	1.56%	1.23%

Challenge: **High proportion of student renters impacts achievable potential in the residential sector**

The UNI Department of Housing reported to CFU that only 4,609 of 12,908 UNI students lived on campus during the 2008-2009 school year. Since the majority of the remaining college students are renters living within the CFU service territory, they compose a unique population with unique challenges, for at least two reasons:

- Renters in the CFU service territory are predominantly college students, often a transient population who historically have not participated in CFU's programs to the same extent as have other renters and residential property owners in the CFU service territory.

- Landlords of properties in CFU's service territory that predominantly house student tenants may face different obstacles for participating in energy efficiency programs than other rental properties. Their tenants traditionally neither occupy the property for several years nor qualify or apply for assistance programs such as Federal LIHEAP or US Department of Housing and Urban Development programs.

CFU will continue investigating energy-saving programs in which tenants can participate directly. Additionally, CFU will continue developing mechanisms and programs to target landlords for implementing low-cost weatherization measures, building shell, HVAC system, water heating, common area lighting improvements, appliance recycling initiatives, and other major energy efficiency improvements. However, the split-incentive market barrier, where landlords fail to directly recover savings from many of the efficiency improvements they finance because they are realized on the reduced utility bills of tenants, continues to be a challenge.

Although service territories of other utilities include a larger number of universities and universities or research institutions that are physically larger than UNI, CFU estimates that very few other utilities in Iowa have as large a percentage of total residential accounts that are composed of college students occupying rental properties.

Challenge: **Rural residential customers served by CFU may use different fuels**

As of summer 2009, CFU estimates that approximately 4.5%, or about 650 of its residential electric accounts, use propane for their primary heating and/or water heating fuel. The energy efficiency opportunities that CFU can promote to these customers are more limited in scope than what can be

provided to many other residential customers. CFU also has a few electric customers (estimated at less than 50) that are natural gas customers of Black Hills Energy.

Opportunity: **Rural residential and student rental customer segments have not historically been as widely targeted for participation in CFU programs**

Because they have not been able to participate in many of CFU's HVAC and insulation energy efficiency programs, there may be different levels of potential remaining in these residential customer sectors than in other CFU residential sectors. Beginning in 2010, CFU is expanding its rebate programs to include provide more opportunities for these customer segments to reduce their energy usage. CFU's expansion of compact fluorescent lighting rebate programs and recycling programs for dehumidifiers and window air conditioners are new options for renters; these same programs and new insulation incentives should provide opportunities for rural residential customers. Additional weatherization and lighting options through CFU's House Calls audit program and a pilot collaboration program with Green AmeriCorps are also being promoted more thoroughly to both of these groups of customers.

Factor 2: Used past program information, experience, and information from local contractors and national resources to modify measure cost, administrative cost factors, and market size assumptions for some residential measures.

See the files called "CFU Cost-Effectiveness Analysis.xls": changes are commented upon and documented accordingly.

Challenge: **By offering residential energy efficiency programs since 1970s, CFU has lowered the amount of achievable potential in CFU's residential sector relative to some other Iowa municipal utilities in the ECW study**

CFU has offered primarily residential demand-side management programs for customers in varying levels since the 1970s. These programs have included consulting services (energy audits, blower doors, thermal imaging, and ACCA Manual J heating and cooling load calculations) and energy efficiency rebates (HVAC equipment, water heaters, insulation, and appliances). Since the year 2004 alone, CFU has provided over 3,100 HVAC system rebates for existing homes – furnaces, central air conditioners, boilers, geothermal heat pumps, and air source heat pumps – which represents a substantial percentage of CFU's customers.

Figure 11. CFU Residential HVAC Historical Program Participation Information

Service	# of Residential Customer Accounts	% Residential Accounts Receiving New, properly sized HVAC equipment since 2004**
Electric Customers	15,180*	17.9%
Natural Gas Heating Customers	11,510***	11.74%

* As reported on the 2008 ME-1

**HVAC systems include air source heat pumps, ground source heat pumps, central air conditioners, natural gas forced-air furnaces, and natural gas boilers installed at existing homes or as part of CFU's new construction program.

***11,563 natural gas customers were reported on the 2008 MG-1; 183 of these customers are not natural gas heating customers and have been excluded from this table.

These findings are corroborated by results from the latest CFU's annual customer satisfaction survey (Appendix 4), in which those surveyed indicated a high level of participation in CFU's HVAC rebate programs in past years:

Figure 12. Excerpt from CFU annual customer satisfaction survey.

Which of the following CFU energy efficiency programs have you used in the past?

(N = 400)	Percent
Free energy audit	20.8
Home insulation	7.5
Home weatherization	1.3
Furnace, boiler or heat pump replacement	22.0
Air conditioner replacement	19.0
Change A Light, Change The World	18.8
Shade tree discount	14.8

The tables above suggest that the amount of achievable savings potential for CFU may be different from many of the other municipal utilities who participated in the ECW study. CFU thereby disputes the statement in the ECW and IAMU study on page 17 that *"it is important to*

note that a number of IAMU members already have well established and successful energy efficiency programs in place. These utilities could be able to achieve the aggressive levels of energy efficiency projected for 2018 sooner than those utilities that do not yet have programs in place."

Although CFU has many advantages from a running a currently mobilized program, it also faces challenges in maintaining high participation levels because many of the residential customers most willing and interested in participating in CFU's programs have already taken advantage of the programs. In other words, realizing aggressive goals is certainly within the realm of feasibility, but may take more time to achieve, may require the usage of innovative or additional programs (i.e., energy code enforcement assistance and on-bill financing), and may potentially cost more than in a municipal service territory that has had no prior existing energy efficiency programs.

CFU thereby also believes that estimates of the "achievable factor" components mentioned at the bottom of page 2 of the ECW study, principally the "percentage of the market that is not yet energy efficient" may not be representative of CFU service territory, primarily for residential HVAC equipment.

Factor 3: Modified Avoided Costs for CFU service territory

See the section called "Summary of Resources and Factors" to see the avoided costs used and explanation.

Factor 4: Conducted feasibility/qualitative screening of residential measures included in CFU's economic potential and other common program measures.

For a detailed list of this process, please consult Section V, Appendix 2: "Feasibility/Qualitative Screening for Residential and Small Commercial Assessment of Potential".

Remark: **The inclusion of fuel-switching measures significantly impacted the amount of residential economic savings potential**

The inclusion of geothermal heat pumps and other fuel-switching measures as residential natural gas measures significantly skewed upwards the amount of economic and achievable potential savings from natural gas programs, as alluded to on page vi of the Executive Summary of the ECW study. Since CFU is substantially larger than any other municipal natural gas utility in Iowa and is heavily composed of residential load, the inclusion of geothermal heat pumps and other fuel-switching measures in the natural gas assessments of economic and achievable

potential had a particularly sizeable effect on ECW's estimated potential natural gas savings for CFU:

	CFU's Achievable Potential, Including Geothermal Heat Pumps as a Natural Gas Measure (Page F-8 of ECW Study)	CFU's Achievable Potential, Excluding Geothermal Heat Pumps as a Natural Gas Measure (Calculated with assistance from IAMU)
CFU's estimated savings potential, as a % of total retail MCF sales	1.10%	0.73%

Nonresidential Assessment of Potential – Factors and Adjustments

CFU, with assistance from IAMU, estimates the following amount of potential in the commercial, industrial, and agricultural sectors:

Figure 13. Commercial Economic and Achievable Potential

Potential	Electric	Natural Gas
Baseline Forecast (GWh or ccf)	233.91	5,450,680
Economic Potential (GWh or ccf)	42	1,538,218
Achievable Potential, 2012 (GWh or ccf)	2.5	49,418

Figure 14. 2012 Industrial/Agricultural Economic and Achievable Potential

Potential	Electric	Natural Gas
Baseline Forecast (GWh or ccf)	75.91	2,235,640
Economic Potential (GWh or ccf)	17.62	323,022
Achievable Potential, 2012 (GWh or ccf)	0.56	6,663

Figure 15. Other Program Cost Factors

Administrative Program Cost Factors	$/kWh	$/therm
Commercial, Industrial, & Agricultural	$0.003	$0.030

Since CFU has not offered as aggressive programs in its nonresidential sectors as its residential sector, ECW's assumptions about measure types, market size, and administrative costs were not modified by CFU. **However, CFU made the following modifications to and comments regarding the ECW assessment of potential for the nonresidential sector energy savings potential:**

Factor 1: Removed UNI's retail sales from top-down assessment of commercial savings potential

UNI represents approximately 8% of CFU's electric MWH sales and less than 1% of CFU's natural gas sales. Although UNI has a few retail accounts with CFU, the university is largely a wholesale electric customer of CFU whose primary heating fuel is not provided by CFU. Additionally, the rate provided to UNI by CFU approximates a wholesale rate, and does not include cost recovery for CFU energy efficiency program costs.

For administrative reasons UNI is reported as a retail customer on EIA-861 and EIA-176 reports. Because the initial assessment used retail sales data from EIA-861 and EIA-176, UNI's load was therefore included in the initial assessment of CFU's achievable potential. Although CFU and UNI continue to collaborate on some energy efficiency audits and energy efficiency projects, UNI has departments and staff on campus who are largely responsible for managing energy usage, building decisions, and opportunities for improving energy efficiency on campus. Furthermore, individual students living on campus and buildings are not direct customers of CFU. With these factors in mind, CFU will not plan to administer and market targeted demand side management programs specifically for UNI facilities and students living on campus. CFU's energy sales to UNI have been excluded from the CFU cumulative retail sales that were used to estimate potential commercial and industrial savings for CFU.

Factor 2: Used local demographic and retail sales data to customize global assumptions of CFU's growth, industrial market distribution, and new construction levels.

Figure 16. Industrial Market Sector Distribution for Top-Down Allocation of Industrial Electric Savings Potential

Sector	NAICS Category	ECW Percentage Allocated (Electric)	CFU Percentage Allocated (Electric)
Chemicals	325	15.2%	0%
Elec. Equipment & Appliances	335	8.6%	0%
Fabricated Metals	332	5.4%	18.3%
Food	311	14.2%	0%
Machinery	333	7.3%	63.6%
Nonmetallic Minerals	327	9.8%	0%
Other	9991	4.9%	2.83%
Plastics & Rubber	326	2.3%	1.19%
Primary Metals	331	8.7%	3.0%
Pulp & Paper	322	6.0%	0%
Transport Equipment	336	8.8%	8.38%
Wastewater Treatment	9990	2.0%	2.70%
Wood Products	321	6.8%	0.05%

Figure 17. Industrial Market Sector Distribution for Top-Down Allocation of Industrial Natural Gas Savings Potential

Sector	NAICS Category	ECW Percentage Allocated (% of Ind. Natural Gas Sales)	CFU Percentage Allocated (% of Ind. Natural Gas Sales)
Chemicals	325	31.6%	0%
Elec. Equipment & Appliances	335	0.0%	0%
Fabricated Metals	332	2.3%	42.5%
Food	311	11.2%	0%
Machinery	333	3.3%	47.3%
Nonmetallic Minerals	327	0.0%	0%
Other	9991	2.0%	5.1%
Plastics & Rubber	326	0.0%	0%
Primary Metals	331	40.7%	1.1%
Pulp & Paper	322	0.0%	0%

Transport Equipment	336	3.8%	3.2%
Wastewater Treatment	9990	2.0%	0.7%
Wood Products	321	1.7%	0.2%

Challenge: **Proportion of newer commercial construction is higher than many other municipal utilities included in the study**

The number of commercial building permits issued in Cedar Falls since 1999 – 205 permits – is significantly higher than that at many of the utilities included in the IAMU assessment. This is further reflected by CFU's modification of the commercial sales growth rate:

Annual Electric Sales Growth Rate	ECW Study Estimate	CFU Estimate
Commercial	1.76%	6.83%

Similar to arguments made by Iowa's rural electric cooperatives in their December 31, 2008 (IAEC, 2008) filing to the Iowa Utilities Board, opportunities for energy efficiency are often more limited in newer vintage building stock. CFU will continue to provide these customers with opportunities through expanding its commercial new construction, custom, and prescriptive incentives.

Additionally included is a table showing the differences in customer class size between different Iowa utilities. CFU's commercial class is its largest; it is composed heavily of new facilities and of small commercial customers.

Figure 18. 2008 Retail Sales and Comparison of Customer Segments, Data from Iowa Utilities Board

	Residential Sales (% of Total Sales in parentheses)	Commercial Sales (% of Total Sales in parentheses)	Industrial Sales (% of Total Sales in parentheses)	Total Sales[1]	IA Residential Electric Accts
Nine largest municipals (ranked in terms of Total Sales). Data Source: 2008 ME-1					
Muscatine Pwr & Water (Elec)	100,382 (11.5%)	153,331 (17.7%)	586,941 (67.8%)	865,514	9,650
City of Ames (Elec)	156,440 (27.3%)	189,854 (33.2%)	137,713 (24.0%)	572,661	21,500
Cedar Falls Utilities (Gas & Elec)	162,764 (36.1%)	194,713 (43.2%)	35,548 (7.9%)	450,760	15,180
City of Pella (Elec)	36,592 (18.5%)	20,762 (10.5%)	135,517 (68.7%)	197,322	4,026
Spencer MU (Elec)	64,829 (40.5%)	79,868 (49.9%)	6,965 (4.4%)	159,908	5,030
Denison MU (Elec)	31,149 (20.4%)	40,905 (26.8%)	70,398 (46.1%)	152,836	2,659
Webster City (Elec)	32,554 (22.1%)	27,346 (18.5%)	81,591 (55.3%)	147,590	3,924
Waverly Light & Power	36,529 (25.3%)	15,049 (10.4%)	83,349 (57.7%)	144,553	3,907
Iowa's 2 largest IOUs (ranked in terms of total sales). Data Source: 2008 IE-1					
MidAmerican Energy	5,372,499 (28.6%)	3,718,733 (19.8%)	8,309,716 (44.3%)	18,762,236	543,912
Interstate Power and Light Company	3,894,472 (25.8%)	3,751,083 (24.9%)	7,378,231 (48.9%)	15,089,647	407,695
Nine largest distribution RECs (ranked in terms of Total Sales). Data Source: 2008 EC-1					
Eastern Iowa Light & Power	285,794 (43.9%)	42,351 (6.5%)	319,647 (49.1%)	651,401	21,343
Iowa Lakes Electric Coop.	175,312 (32.7%)	109,075 (20.3%)	249,143 (46.5%)	536,277	8,956
North West REC	244,114 (48.9%)	78,975 (15.8%)	175,927 (35.2%)	499,298	8,691
Linn County REC	233,510 (60.2%)	96,267 (24.8%)	62,042 (16.0%)	387,818	20,604
Midland Power Coop.	158,450 (43.3%)	34,800 (9.5%)	170,344 (46.6%)	365,586	8,966
Maquoketa Valley REC	203,814 (77.2%)	51,337 (19.4%)	8,541 (3.2%)	264,028	13,694
Heartland Power Coop.	87,702 (34.5%)	28,772 (11.3%)	135,970 (53.6%)	253,878	4,514
Prairie Energy Cooperative	63,967 (25.7%)	44,323 (17.8%)	140,953 (56.5%)	249,373	3,736
Access Energy Cooperative	119,562 (51.3%)	33,642 (14.4%)	79,957 (34.2%)	233,190	8,599

[1] **Total Retail Sales to Ultimate Consumers, reported on 2008 IG-1, ME-1, and EC-1. Includes all other retail sales in addition to residential, commercial, and industrial retail sales.**

Opportunity: **More "low-hanging fruit" projects remain in existing buildings in CFU's commercial sectors than CFU's residential sector**

Since many of CFU's past programs have not as aggressively targeted commercial customers in the CFU service territory, there are many cost-effective projects, particularly in the commercial lighting and refrigeration sectors.

Factor 3: Modified Avoided Costs for CFU service territory

See the section called "Summary of Resources and Factors" to see the avoided costs used and explanation.

Part IV: Description of Programs Used by CFU

Among CFU's priorities in 2010 are increasing the programs and services offered to CFU nonresidential customers, expanding the amount and types of rebate programs available to all CFU residential customers, and streamlining administrative and recordkeeping processes.

Residential Energy Efficiency Portfolio

Below are summaries of measures, incentives, implementation strategies and target markets for CFU's 2010 rebate programs. Rebates and application forms will be available on www.cfunet.net, starting in first quarter 2010. Marketing and implementation strategies are thoroughly described in the "Marketing, Education, and Related Initiatives" section.

Prescriptive Rebates

In 2010, CFU plans to offer prescriptive rebates for the measures described below. Rebates will predominantly be offered directly to CFU customers who make energy efficient improvements. Rebate levels and eligible equipment are reviewed periodically, as marketing conditions or federal standards change.

Appliances, Lighting, and Water Heating

2010 Compact Fluorescent Lamps and Fixtures		
Specialty Compact Fluorescent Light Bulbs *(standard bare-spiral and mini bare-spiral CFLs are available through CFU home energy audits and the Change A Light, Change The World promotion)*	50% of bulb purchase cost, up to $5 per bulb. 10 per account.	Any ENERGY STAR® qualified CFL fitting one of these categories: • Dimmable or three-way (any wattage) • Covered CFLs (A-line, bullet, globe, reflector, candle, post) • Higher than 30 watts • Bare-circuline or bare-twin, triple, or quadruple tube
Fluorescent Fixtures	$20 per fixture. 6 fixtures per account.	Any ENERGY STAR qualified fixture that uses pin-based CFLs.
Ceiling Fan Light Kits	$20 per light kit. 6 light kits per account.	Any ENERGY STAR qualified light kit, including light kits that come packaged with ENERGY STAR ceiling fans. Light kits must use pin-based CFLs. ENERGY STAR ceiling fans are not eligible.

2010 Appliances and Water Heaters		
Clothes Washers	$100	Must be ENERGY STAR qualified. CFU must supply water heating fuel.
Natural Gas Tankless Water Heaters *(or other gas water heaters that meet EF requirement)*	$300	Must be ENERGY STAR qualified and have a minimum EF of 0.82.
High Efficiency Dishwashers *(permanently mounted units only)*	$75	CEE Tier 1 or higher. List available at www.cee1.org

Target markets:

Predominantly owner-occupied residential properties (single-family, multi-family, and mobile homes) and landlords of multifamily properties (through CFU's multifamily program). Both existing and new construction are eligible (unless CFU's new construction program has already provided incentives). The target market for the specialty CFLs also includes tenants occupying residential properties in CFU's service territory.

Implementation strategies:

Rebates offered directly to customers; some lighting rebates are also provided to retailers as described below. Additional marketing and outreach information is located in the "Marketing, Education, and Related Initiatives" section.

CFU also plans to continue participating in the ENERGY STAR® Change A Light, Change The World promotion every fall as it is made available to Iowa's consumer-owned utilities. This program features upstream incentives to participating retailers for selling qualified high efficiency compact fluorescent lighting. CFU has expressed interest regarding future long-term collaboration with the current program administrator, the Wisconsin Energy Conservation Corporation, and also during a July 22, 2009 stakeholder meeting organized by the Iowa Office of Consumer Advocate.

Residential customers interested in purchasing standard bare-spiral or mini-bare-spiral compact fluorescent lighting can receive lighting through CFU's House Calls audit or multifamily programs and through purchasing bulbs through the Iowa Change A Light, Change The World promotion or other ongoing promotions.

Future Lighting/Appliance Initiatives:

Because customers frequently contact CFU with questions about CFL disposal, and because a number of customers indicated concern on the 2009 annual customer satisfaction survey about the level of

mercury in CFLs, CFU plans to develop more information and materials about the levels of mercury in CFLs and proper methods of CFL disposal.

Appliance Recycling

2010 Appliance Recycling Rebates		
Standard Refrigerators	$50. 2 per account per year	Must be 16 cubic feet or larger.
Freezers	$50. 2 per account per year	Must be 16 cubic feet or larger.
Window air conditioners	$25. 2 per account per year.	
Dehumidifiers	$25. 2 per account per year.	

Target markets:

Predominantly owner-occupied properties and landlords of residential, multifamily, and nonresidential properties. Existing and new construction; both residential and nonresidential customers are eligible. Tenants occupying residential and commercial properties in CFU's service territory who own qualifying equipment are also eligible to participate.

Implementation strategies:

CFU is working together with the City of Cedar Falls Department of Public Works, who already offers recycling services for all of these appliances. All working equipment must be collected by the City of Cedar Falls in order to qualify for a rebate.

Rebates will be offered directly to customers; possibilities for coordinating rebates with the City of Cedar Falls are further summarized in the "Internal Processes" section. Additional marketing and outreach information is located in the "Marketing, Education, and Related Initiatives" section.

Future Appliance Recycling Initiatives:

Because the City of Cedar Falls publicly offers recycling for a variety of additional household appliances and electronics, CFU will use the results of its 2010 appliance recycling program to determine whether to include other equipment in its recycling program or other necessary adjustments.

HVAC Equipment and Sizing

2010 HVAC Systems – all systems must be sized by CFU			
Natural Gas Boilers	$400	92% AFUE	(Heating)
Natural Gas Furnaces	$200	95% AFUE	(Heating)
Central Air Conditioners	$200 + $100 x (SEER – 14.0); $500 maximum	14.0 SEER	(Cooling)
Ground Source Heat Pumps *(open or closed loop)*	$600 per ton for new ground loop installations; $300 per ton for existing group loop installations	3.3 COP 14.1 EER 3.3 COP 14.1 EER	(Heating) (Cooling) (Heating) (Cooling)
Air-Source Heat Pumps *(two stage units only)*	$300 + $100 x (SEER – 15.0); $600 maximum	8.5 HSPF 15.0 SEER	(Heating) (Cooling)

Target markets:

Owner-occupied residential properties and landlords of residential, mobile home, and multifamily properties. Existing and new construction (unless new construction is participating in 5 Star Homes program). Large multifamily properties may be eligible for custom rebates through CFU's nonresidential program.

Implementation strategies:

CFU makes incentive payments directly to customers, but also collaborates directly with local trade allies. In this process, CFU makes Manual J based heating and cooling load calculations for customers who are interested in making HVAC equipment upgrades; the sizing is provided directly to the contractor selected by the customer. CFU also remains in contact with the contractor during the rebate application process to verify that properly sized and qualifying equipment has been installed.

This approach has worked well for the CFU's small service territory because of a lack of consistency CFU has encountered in two main areas in its service territory:

1) The sizing calculation methodologies used by different local trade allies
2) The methodologies used by local trade allies to interpret their sizing calculations and select properly sized HVAC equipment, especially cooling equipment

Since 2000, CFU has made these calculations for more than 5,000 of its residential and small commercial properties, with only 2 cases where HVAC systems had to be replaced with larger systems.

Future HVAC Initiatives:

Additional equipment and programs are under consideration. Additionally, CFU plans to expand the education and outreach offered to its contractors regarding proper HVAC equipment installation and duct system practices. More information is located in the "Marketing, Education, and Related Initiatives" section.

Thermal Envelope Improvements

2010 Thermal Envelope Improvements		
	Heating Fuel Provided by CFU	Heating Fuel Not Provided by CFU
Attic/Ceiling Insulation	60% up to $1,000	60% up to $200
Sidewall Insulation	60% up to $1,000	60% up to $200
Foundation Insulation (incl. basement walls, crawlspace, band/rim joist projects)	60% up to $1,000	60% up to $200
Caulking, Air Sealing, and Weather Stripping	60% up to $250	Not eligible

Target markets:

Owner-occupied residential properties and landlords of residential, mobile home, and multifamily properties. Existing construction only. Large multifamily properties may be eligible for custom rebates through CFU's nonresidential program.

Implementation strategies:

CFU makes incentive payments directly to customers for insulating properties up to maximum of levels specified in the IECC 2009. CFU also collaborates directly with local trade allies through its requirement that customers use professionally contracted labor and through its rebate application processes. Additional marketing and outreach information is located in the "Marketing, Education, and Related Initiatives" and "Internal Processes" section.

Although offering rebates to non-CFU heating fuel customers did not pass cost-effectiveness screening in CFU's assessment of potential, less than 5% of CFU's residential customers use propane or alternatives as their primary heating source. Because of this, CFU has decided to make these customers eligible for reduced rebates, provided that they have central air conditioning and are electric customers of CFU. Because only a small number of these customers are expected to utilize this rebate annually, CFU does not anticipate that offering rebates to these customers will significantly impact the overall cost-effectiveness of CFU's total electric and natural gas residential program portfolios. Depending upon how many customers participate in the pilot in 2010, CFU will determine whether to continue offering this opportunity in future years.

Future Building Shell Initiatives:

Additional equipment and programs are under consideration. Additional marketing and outreach information is located in the "Marketing, Education, and Related Initiatives" section.

Home Energy Audits

The House Calls Project is CFU's walk-through energy audit. The auditor visits with the customer to discuss energy efficiency and customer comfort issues, inspects a variety of equipment and household conditions, and provides low-cost energy saving measures during the audit. A packet of materials about generic energy saving methods, CFU rebate programs, and the Change A Light, Change the World promotion are left with the customer during the audit. Customers reporting comfort issues are also offered the chance to have a blower door, duct blaster, flow hood, or thermal imaging services to be conducted. After the audit, a follow-up letter is sent to the customer with energy savings recommendations and resources they should consider, given their specific household. In some cases, approximate savings and simple paybacks are estimated for customers. These estimates are intended to motivate customers to implement energy efficiency improvements.

Customers are also given a follow-up comment card to rate the audit experience and discuss how they heard about the House Calls audit program. Of the 500+ customers that completed an audit in 2009, CFU received average ratings of 4.9, 4.8, and 4.8 out of 5.0 for professionalism, knowledge base, and customer service, respectively.

Measures and services included on walkthrough audit:

- Up to 3 bare-spiral compact fluorescent light bulbs (customer choice of wattages)
- 2 faucet aerators
- Hot water temperature turndown, if necessary
- 2 low-flow showerheads
- Identification of household insulation levels, age of HVAC equipment
- Identification of other energy savings opportunities
- Heating and cooling load calculations if necessary

The CFU Division of Gas Operations can also assist customers with safety inspections of gas equipment. For more information about the Division of Gas Operations or CFU's advanced diagnostics, including blower doors, thermal imaging, and flow hoods, see the section in CFU's educational programs entitled "Marketing, Outreach, and Related Initiatives".

Target markets:

Primarily owner-occupied residential properties and landlords of residential, mobile home, and multifamily properties. Primarily existing construction. Large multifamily properties may be eligible for audits through CFU's nonresidential or multifamily programs. Permission of landlord is required for tenant-requested audits.

Residential Energy Audit Future Initiatives

For 2011 or future years, CFU is examining the feasibility of several new additional options in future years, including online audits and offering performance-based home improvement incentives through Home Performance with ENERGY STAR or other methods. Right now CFU's main priorities are on building up the number of prescriptive rebates available to CFU residential, multifamily, and commercial customers and streamlining internal processing, recordkeeping, and data basing processes.

In the middle of 2009 CFU began tracking the proportion of customers who received an audit since 2008 and subsequently participated in rebate programs. CFU plans to use this information to target customers who have not yet implemented energy-saving recommendations through a variety of mail, cable television, and phone call campaigns.

Residential New Construction/Energy Code Enforcement

CFU provides three main residential new construction resources at this time:

Resource 1: 5 Star Homes

2010 5 Star Homes – all homes inspected and sized by CFU	
Lighting	• Recessed CFL or LED lighting
Duct Sealing/Infiltration	• Sheet metal joints: Sealed with mastic or UL-181 approved tapes • All low-pressure supply and return ducts sealed • 0.25 Natural Air Changes per Hour (NACH) • Air-to-air heat exchanger (Heat Recovery Ventilator)
Heating System Options	• Programmable thermostat • Natural gas forced-air furnace (95% AFUE minimum; ECM motor) • Natural gas boiler (92% AFUE minimum) • Ground source heat pumps, open or closed loop (3.3 COP)** • Air-source heat pump (8.5 HSPF minimum; two-stage units with variable air speed handlers)
Cooling System Options	• Programmable thermostat • Central Air Conditioner (16.0 SEER minimum) • Air-source heat pump (15 SEER minimum; two-stage units with variable air speed handlers) • Ground source heat pumps, (open or closed loop; 14.1 EER and 3.0 COP minimums)
Insulation/Windows	• Attic Insulation: R-50 • Floor Insulation (above unconditioned space): R-30 • Band/Rim Joist Insulation: R-19 • Wall Insulation (wood frame walls): R-19 • Windows (0.35 U-value or less) • All other necessary insulation as stated by IECC 2009
Appliances/Water Heater	• ENERGY STAR® qualified refrigerator • ENERGY STAR qualified dishwasher • ENERGY STAR qualified clothes washer • Natural gas water heater: 0.62+ Energy Factor; or • Electric water heater: 0.92+ Energy Factor
Must pass CFU Sealing and Insulation Inspections	

Target Market

Residential new construction (single-family, townhomes, and condominiums). Larger multifamily properties are eligible for incentives through CFU's nonresidential or multifamily programs.

Implementation Strategies:

CFU has currently opted to offer a prescriptive residential new construction program with direct rebates offered to customers. Given CFU's small service territory, this approach has allowed CFU to personally evaluate the blueprints of every qualifying new home in its service territory, guide customers towards making energy efficient decisions, and verify high efficiency improvements. Many of the guidelines are consistent with those used in builder option packages that are options in other residential new construction programs in Iowa.

CFU's 5 Star Homes account manager is a RESNET-accredited professional who meets directly with interested new homeowners and area builders during the design phase of new homes. By working directly with the involved parties, CFU can ensure that construction consistently meets its program standards, the customer and contractor's general questions about energy efficiency have been answered, HVAC equipment is properly sized, and that local codes are adhered to during the construction process. Multi-year rate discounts are provided to the homeowner upon verification that the property meets the prescriptive requirements.

The program is marketed through a variety of methods, including yard and real estate signage, certificates, and informational brochures and online materials for interested customers and builders. Additional information is available in the section called "Marketing, Outreach, and Related Initiatives".

5 Star Homes Future Initiatives:

CFU is considering adaptations to its new construction program for future years, including adding more requirements, creating additional tiers with higher incentives for meeting more stringent efficiency requirements, or offering multiple methods for builders and new homes to meet CFU program guidelines and receive incentives.

Resource 2: Energy Code Enforcement Assistance

CFU assists the City of Cedar Falls by conducting wall insulation and foundation insulation inspections for 100% of new residential construction, qualifying small new construction, and for renovations and additions of both existing residential and qualifying small commercial facilities built within the City of Cedar Falls. The only major exception is manufactured housing. The inspections aid the City of Cedar Falls in efforts to enforce the residential energy code. Additionally, CFU has also conducted caulking/foaming inspections of new construction in efforts to minimize air leakage. The additional caulking/foaming inspection includes inspection of the following elements below (some of which are part of the IECC 2009):

- Utility (wiring or plumbing) penetrations of top-plate (for both interior and exterior walls)
- Perimeters of baseplate and flooring areas
- Joints and seams
- Utility plumbing and wiring that horizontally pass through a stud wall to another stud cavity
- Other sources of infiltration

CFU believes that these inspections improve the quality of all local construction. Homes that are built outside the City of Cedar Falls, but within the CFU service territory are eligible for these inspections as well, provided that the builder or homeowner expresses interest in participating in the CFU 5 Star Homes program.

Resource 3: HERS Ratings for Local Builders

CFU employs a RESNET accredited professional who conducts HERS ratings for local builders who are interested in taking advantage of federal tax credits for efficient new residential construction or meeting ENERGY STAR standards. Local builders can contract with CFU for these services but otherwise receive no incentive directly from CFU for meeting ENERGY STAR standards.

On-Bill Financing

Program Context and Rationale

CFU has used on-bill financing since 1998 to enable residential customers to undertake energy efficiency and renewable energy improvements to their homes. CFU believes that removing the barrier of high upfront project costs is crucial to increasing customer buy-in and participation in energy efficiency property upgrades. Furthermore, since CFU has offered varying residential energy efficiency programs since the 1970s, much of the "low hanging fruit", or highly cost-effective residential projects, have already been undertaken. Financing has allowed CFU to increase participation and provide further impetus for customers who have otherwise been unwilling or unable to participate in CFU rebate programs. In order to enable CFU to offer zero-percent financing, the CFU Board of Trustees has allocated $1 million from the CFU general funds to be used as a revolving loan fund for owner-occupied residential properties served by CFU.

Program Guidelines and Process

Loan terms are 0% interest for up to 4 years ($4,000 maximum), with the exception of geothermal systems, for which financing is available up to 10 years ($10,000 maximum). Program terms are subject to periodic review. Until July 2009 the $10,000 and 10 year loan terms were in place for all qualifying

equipment. Program terms were changed in July 2009 due to higher than expected initial participation levels.

Contractors and dealers in Cedar Falls are aware of this program and help market the opportunity to customers. In order to receive financing, customers must submit a completed loan application to CFU. Upon approval from CFU and an itemized invoice from a contractor or dealer documenting project completion, CFU pays the dealer or contractor directly and inserts the appropriate charge on each customer's bill. CFU also places a Universal Commerce Code fixture filing on each participating property. The total budgets for 2010 are unknown at this time; they are contingent upon the amount of revolving fund that is replenished by currently participating customers.

Sources of Capital	$1,070,000 revolving loan fund from CFU's general revenue funds
Financing Mechanism	Consumer loan
Collection Mechanism	On Utility Bill
Enhancements	Zero-percent interest rate
Eligible Measures	Must meet CFU efficiency requirements in order to qualify • Geothermal Heat Pumps • Ceiling, Wall, & Foundation insulation upgrades • Central Air Conditioners • Solar Hot Water Heaters • Natural Gas Forced-Air Furnaces • Natural Gas Boilers • Add-On and Air Source Heat Pumps (two speed systems with variable air speed handlers) • Residential scale renewable distributed generation (photovoltaics and wind)
Who Processes Application?	CFU
Credit Requirements	No set bar; review credit and bill payment history. Credit review by Community National Bank for loan requests over $3,000.
Security Interests	Secured by lien on home
Program Start Date	Summer 2008; earlier loans of up to $2,000 were available for building shell and insulation upgrades.
Target Market	Existing owner-occupied residential properties
Marketing Channels	Contractors, suppliers, CFU, customer word-of-mouth
Average Loan Amount	Before 5/2008: $1,139 Since 5/2008: $5,612.63
Interest Rate & Term	0%; 1 year of financing per $1,000 loaned. After 7/2009: $4,000 or 4 year cumulative maximum (geothermal system maximums are $10,000 and a 10-year maximum). Loan amounts rounded up to next $1,000.

Financing Issued since Inception	$975,000+
% Residential Customers Served since Inception in 1998	517 loans; approximately 3.5% of residential customer base
Default Rate since Inception	0%

Multifamily and Low-Income Programs

There are currently 3 components of CFU's multifamily and low-income programs:

Resource 1: Multifamily Incentives

Landlords of multifamily properties are eligible for the rebates for prescriptive equipment that are included in the Residential Portfolio, except costs and savings will be tracked separately. Tenants are eligible for CFL rebates and appliance recycling rebates.

Large multifamily units are also eligible as needed for prescriptive equipment, lighting, and custom nonresidential rebates that are included in the Nonresidential Portfolio. CFU conducts ACCA Manual J sizing calculations for heating and cooling equipment or helps the landlord find a qualified technical resource which the customer can use to receive information and identify large-scale and comprehensive energy efficiency projects.

Future Initiatives for Multifamily Incentives:

In 2010, CFU plans to begin inspecting a proportion of the multifamily units that received incentives for insulation, in order to verify correct and adequate quality of insulation materials. CFU also is exploring additional rebates and additional audit options for these customers.

Resource 2: Basic Weatherization Assistance Pilot/Community Energy Initiative

AmeriCorps is a group administered by the University of Northern Iowa's Center for Energy & Environmental Education that provides basic weatherization and infiltration reduction services, in conjunction with local insulation contractors. Through 2009 and 2010, CFU plans a pilot collaboration with this group in order to help install basic weatherization changes in rental and some homeowner properties in the CFU service territory.

CFU typically performs an initial walkthrough and pre-project blower door tests of each rental unit at a participating address or home. An AmeriCorps employee is typically present during the pre-project blower door in order to prioritize areas of high leakage and address them. AmeriCorps, local contractors, and landlords or homeowners work together to perform the actual equipment upgrades. CFU provides basic weatherization materials that AmeriCorps and other entities install on qualified premises, and landlords participating in this program are eligible for CFU custom (where applicable) and prescriptive rebates for insulation and qualifying equipment.

Advantages to property owners and occupants

- Little to no additional costs for property owners (labor and weatherization materials provided)
- Improved comfort for tenants and improved longevity of property
- Resource for customers who face physical or other limitations that prevent them from making basic energy efficient improvements to their properties.

Phase One: Initial Audit/Blower Door Test

- Inspection on heating system and estimates of existing insulation levels
- Sizing of HVAC systems, if needed
- Hot water temperature turn down, if necessary or feasible
- Installation of compact fluorescent lamps, faucet aerators, and/or low-flow showerheads
- Pre-project blower test (some properties will also be selected for post-project blower door test verification)

Phase Two: AmeriCorps and Other Entities' Involvement

- Installation of infiltration reduction measures: weather stripping, caulk, rim/band joist insulation, or other measures (if they were not installed during phase one). Materials provided by CFU; labor provided by AmeriCorps or other entities.
- Other optional projects of the property owner's choice (to be financed by property owner and CFU incentives): Insulation, HVAC equipment, water heaters, and other eligible equipment

Phase Three: Inspection and Incentives

- A certain number of properties will be selected for post-project blower door tests and post-installation, in order to verify installation and quantify impacts
- Incentive payments made to property owners if they had implemented other major systems upgrades (i.e., insulation, HVAC systems, etc.)

Resource 3: Major System Upgrades for Low and Fixed Income Customers

CFU and the City of Cedar Falls work together to provide support for low and fixed income citizens whose homes require substantial HVAC, water heating, and/or building shell improvements. These citizens are property owners who are unable to receive federal weatherization assistance from Operation Threshold, the area community action program (CAP) agency.

These customers are often identified from the following sources:

- CFU customer services call center;
- Operation Threshold's list of customers who incomes exceed qualifying guidelines or qualified customers who applied to the program too late to receive immediate assistance.
- CFU's Division of Gas Operations, who may refer customers after making safety inspections of gas equipment at a premise.

In order to be eligible, customers verify to the City of Cedar Falls and the CFU Credit Department that they meet program guidelines. Income guidelines are revised periodically; as of spring 2009, the guidelines were:

Number in Family	1	2	3	4	5	6	7	8
Range Minimum	$20,950	$23,950	$25,900	$29,950	$32,350	$34,750	$37,150	$39,550
Range Maximum	$33,550	$38,300	$43,100	$47,900	$51,750	$55,550	$59,400	$63,250

Once an eligible customer is identified and agrees to participate, CFU and/or the City work with local contractors to make the following types of improvements, if needed:

- New, high efficiency heating and/or cooling systems
- New high efficiency water heaters
- Installation of windows, doors, insulation, and/or infiltration reduction measures
- Proper ventilation for attic, bathrooms, kitchen, and/or clothes dryer
- Evaluation of duct system

Local contractors typically provide services at cost or at reduced prices to help implement these changes and improve these properties. For properties that are either mobile homes, located within FEMA floodplains, or are located outside the City of Cedar Falls, CFU funds replacements listed above that improve the energy efficiency of the home. For other homes in the City of Cedar Falls, the City of Cedar Falls Community Development Block Grant funds are used to match CFU funding for implementing changes in these homes.

Nonresidential Energy Efficiency Portfolio

Since nonresidential sales – retail sales to commercial, industrial, and interdepartmental departments – comprise about 2/3 of CFU total electric sales and 69% of CFU's total natural gas sales, CFU believes this is the sector with the largest and most cost-effective energy savings potential, and has made the expansion of opportunities in this sector a priority in 2010 and future years. Although its industrial customer base is small, the presence of a large and growing commercial customer base presents many opportunities for efficiency.

Prescriptive Incentives

In 2010, CFU plans to offer prescriptive rebates for the following equipment (rebate levels and eligible equipment are reviewed periodically, as marketing conditions or federal standards change):

2010 Direct Install Equipment - no preapproval from CFU		
Programmable Thermostats	$25 per unit	ENERGY STAR® qualified
Packaged Terminal Air Conditioners	$50 per unit	10.5 EER (Cooling)
Packaged Terminal Heat Pumps	$50 per unit	10.5 EER (Cooling) 3.0 COP (Heating)
2010 Custom Equipment - requires CFU preapproval		
	Rebate	**Minimum Standards**
Ground-Source Heat Pumps *(< 300 MBtuh; open and closed loop)*	$600 per heating ton for new ground loop installations; $300 per heating ton for existing ground loop installations	3.3 COP (Heating) 14.1 EER (Cooling) 3.3 COP (Heating) 14.1 EER (Cooling)
(≥ 300 MBtuh)	*Custom Program*	*Custom Program*
Air-Source Heat Pumps *(< 65 MBtuh; two stage systems only)*	$300 + $100 x (SEER – 15.0); $600 maximum	8.5 HSPF (Heating) 15.0 SEER (Cooling)
(≥ 65 MBtuh)	*Custom Program*	*Custom Program*
Natural Gas Boilers *(< 400 MBtuh)*	$400	92% AFUE (Heating)
(≥ 400 MBtuh)	*Custom Program*	*Custom Program*
Natural Gas Furnaces *(< 225 MBtuh)*	$200	95% AFUE (Heating)
(≥ 225 MBtuh)	*Custom Program*	*Custom Program*

Central Air Conditioners & Rooftop Units *(< 65 MBtuh)* *(65-240 MBtuh)* *(≥ 240 MBtuh)*	$200 + $100 x (SEER – 14.0); $500 maximum *Custom Program* *Custom Program*	14.0 SEER (Cooling) 10.8 EER (Cooling) 9.8 EER (Cooling)

2010 Compact Fluorescent Lamps and Fixtures		
Compact Fluorescent Light Bulbs	50% of bulb purchase cost, up to $5 per bulb.	Any ENERGY STAR® qualified CFL.
Compact Fluorescent Fixtures	$20 per fixture.	Any ENERGY STAR qualified fixture that uses pin-based CFLs. Fixtures that accept CFLs with a screw-in base do not qualify.
Ceiling Fan Light Kits	$20 per light kit.	Any ENERGY STAR qualified light kit, including light kits that come packaged with ENERGY STAR ceiling fans. Light kits must use pin-based CFLs. ENERGY STAR ceiling fans are not eligible.
Occupancy Sensors		
Occupancy sensors *Wall-mounted* *Ceiling-mounted*	$15 $25	Must control more than 400 watts
High-bay occupancy sensors *Fixture-mounted*	$25	Must control more than 150 watts
2010 Linear Fluorescent Lamps and Fixtures <u>for Existing Buildings</u> (Projects with more than $10,000 total require CFU pre-approval)		
	<u>Rebate</u>	**<u>Minimum Standards</u>**
U-Bend T8 Fixtures	$10 per fixture	Electronic ballasts
T8 and T8HO Fixtures *<u>4 Foot</u>* *1 lamp* *2 lamp* *3 lamp* *4 lamp*	 $6/fixture $9/fixture $14/fixture $18/fixture $23/fixture	Electronic ballasts, mounting height of ≤ 15 feet. Must retrofit existing T12 lighting.

6 lamp *8 Foot* *1 lamp* *2 lamp*	$8/fixture ($10 for T8HO) $14/fixture ($20 for T8HO)	
T5 Fixtures *2 Foot* *1 lamp* *2 lamp* *46 Inch* *1 lamp* *2 lamp* *3 lamp* *4 lamp* *6 lamp* *8 Foot* *1 lamp* *2 lamp*	 $10/fixture $10/fixture $7/fixture $14/fixture $21/fixture $28/fixture $42/fixture $8/fixture $14/fixture	Electronic ballasts, mounting height of ≤ 15 feet. Must retrofit existing T12 lighting.
2010 LED Lighting and Fixtures		
LED *Refrigerated case lighting* *Exit signs* *Strip lighting* *Other interior/exterior (i.e., recessed downlights)*	 $25 per door $15 per sign $2/linear ft *Custom Program*	 Existing facilities only Existing facilities only Existing facilities only *Custom Program*
2010 High Bay Lighting (One for one replacement of HID lighting; 15 foot minimum mounting height)		
HID Replaced	**Rebate per existing fixture**	**Eligible Replacement Technologies**
250 W – 399 W	$50 per fixture (or $200/kW saved minimum)	**High bay fluorescent ≤ 155 W per <u>total fixture</u>:** *4 lamp T8* *2 lamp T-5HO* *Other T8 or T5HO ≤ 155 W*
400 W – 649 W	$60 per fixture (or $200/kW saved minimum)	**High bay fluorescent ≤ 250 W per <u>total fixture</u>:** *6 lamp T8* *4 lamp T5HO* *Other T8 or T5HO ≤ 250 W*
650 W – 999 W	$70 per fixture (or $200/kW saved minimum)	**High bay fluorescent ≤ 365 W per <u>total fixture</u>:** *6 lamp T8* *4 lamp T5HO* *Other T8 or T5HO ≤ 365 W*

1,000 W	Option 1: $60 per fixture (or $200/kW saved minimum) Option 2: $120 per fixture (or $200/kW saved minimum) Option 3: Custom Program	**High bay fluorescent ≤ 800 W per <u>total fixture</u>:** *(two) 6 lamp T5HO* *Other T8 or T5HO ≤ 800 W* **High bay fluorescent ≤ 500 W per <u>total fixture</u>:** *6 lamp T5HO or 8 lamp T5HO* *8 lamp T8 or 10 lamp T8* *(two) 4 lamp T5HO* *(two) 6 lamp T8* *Other T8 or T5HO ≤ 500 W* **Other high-bay:** *Non T8 and T5HO*
Other HID Replacement	*Custom Program*	*Custom Program*
Custom Lighting Projects (See Custom Program):		
All other lighting projects are part of the Custom Program. Projects include: • All prescriptive projects requesting more than $10,000 in CFU rebates • Ceramic Metal Halide • CFU approved induction, cold cathode, and LED lamps and fixtures • Interior and exterior lighting retrofits • Municipal lighting projects (i.e., LED traffic lights) • De-lamping measures in comprehensive lighting efficiency upgrades • High Performance (HP) T8 systems • Reduced-wattage T8 lamps or systems • Lighting control systems • Daylighting systems and dimmable ballast • Other cost-effective projects or technologies and high bay projects		

2010 Nonresidential Food Service		
	<u>Rebate</u>	**<u>Minimum Standards</u>**
Ice Machines	$100	Any ENERGY STAR® qualified commercial ice machine
Vending Machine Controllers	$50 per unit	Any controller that controls a refrigerated vending machine.
Clothes Washers *(residential or commercial scale)*	$100 per unit	Any ENERGY STAR qualified clothes washer; water heating fuel must be supplied by CFU

Dishwashers *(residential scale)*	$100 per unit	CEE Tier 1 or higher
Other Food Service: • Natural Gas Fryers, Steam Cookers, Convection and Conveyor Ovens • Hot Food Holding Cabinets • Glass and Solid Door Refrigerators/Freezers	*Custom Program*	*Custom Program*
2010 Appliance Recycling – All equipment must be collected by City of Cedar Falls		
Refrigerators	$50	Any working refrigerator over 16 cubic feet in size.
Freezers	$50	Any working freezer over 16 cubic feet in size.
Dehumidifiers	$25	Any working dehumidifier.
Window Air Conditioners	$25	Any working window air conditioner.
2010 Small Motors and VSDs		
Variable-Speed Drives *(1,500 operating hour minimum required)*	$40/hp up to 50% of total equipment and installation costs	*See application form for additional eligibility requirements.*
Motors *(≤ 50 hp)* *(> 50 hp)*	Rebate varies with size and type of motor. See application form. *Custom Program*	*Must meet current NEMA Premium Motor standards.* *Custom Program*
2010 Nonresidential Building Shell and Water Heating		
Insulation/Water Heating All projects	*Custom Program*	*Custom Program*

Target Market

All nonresidential and large multifamily customers; primarily existing construction (unless otherwise specified).

Implementation strategies:

CFU will provide rebates directly to qualified customers. The compact fluorescent lighting rebates are expanded for nonresidential customers because they do not have the opportunity to receive free lights through a House Calls audit, unlike residential customers. For innovative and cost-effective technologies

or energy saving applications that are not included in the list above, rebates will be awarded on a customized basis, primarily awarded on a $/kW, $/kWh, or $/MCF payment based on the savings at or above current ASHRAE codes or other applicable standards.

Future Initiatives for Prescriptive Incentives:

CFU will expand the marketing of these options to its nonresidential customers; see the section "Marketing, Outreach, and Related Initiatives" for more details. In 2011 and 2012, CFU will likely expand its offering of prescriptive rebates and customized equipment rebates, potentially for natural gas food service or building shell upgrades and electric motors or refrigeration programs.

Custom Program

2010 Custom Program	
CFU determines rebates, depending upon type and amount of savings. Eligible projects include, but are not limited to:	
Commercial New Construction **Agricultural Efficiency Projects** **Equipment/Building Improvements** • Water Heating • Chillers and large HVAC equipment • Refrigeration and other food service • Insulation/Weatherization Improvements • Motors (≥ *50 hp)* • Energy management systems • Waste and heat recovery systems • Other process improvements • Other cost-effective projects	**Lighting** • Ceramic Metal Halide • CFU approved induction, cold cathode, and LED lamps and fixtures • Interior and exterior lighting retrofits • Municipal lighting projects (i.e., LED traffic lights) • De-lamping measures in comprehensive lighting efficiency upgrades • High Performance (HP) T8 systems • Reduced-wattage T8 lamps or systems • Lighting control systems • Daylighting systems and dimmable ballast • Other cost-effective projects or technologies

Target Markets:

This program is intended to encompass a broad range of energy efficiency possibilities, including large-scale, comprehensive efficiency improvements at all CFU nonresidential properties, nonresidential new construction projects, implementation of other innovative and cost-effective technologies that are not included in CFU's prescriptive program, and agricultural projects.

Implementation strategies:

For several years CFU has helped its large customers implement customized or large-scale energy efficiency projects by providing customized incentive payments or other support services directly to nonresidential customers. There are currently five main types of custom projects:

1) Awarding customized incentive payments for larger-scale or customized energy efficiency projects of the customer's design;
2) Recommending particular equipment and other energy efficiency changes to implement;
3) Assisting large customers with the selection of an engineering or other technical resources to help the customer implement cost-effective energy efficiency improvements of their choice;
4) Installing additional metering equipment to help customers identify the energy consumption of specific equipment, facilities, or specific areas of facilities; and
5) Working with large new construction customers during the design phase to award incentives for high efficiency new construction.

Rebates are currently awarded on a $/kW, $/kWh or $/MCF of savings reductions. For new construction customers who have conducted energy efficiency assessments or technical engineering evaluations, CFU will use these documents to help determine project cost-effectiveness.

Beginning in 2010, large-scale customized projects will be pre-screened for cost-effectiveness. Projects with a societal benefit-cost ratio of 1.00 or higher will be selected for rebates and incentives, with payments based on the amount of kWh, kW, and/or MCF saved by the project. This criterion may change in future years; right now CFU is prioritizing the most cost-effective projects, particularly projects where savings are most quickly realized.

Future Initiatives for Custom Program:

CFU plans expanded promotion of this program to local customers and trade allies; see the section "Marketing, Education, and Related Initiatives" for more information. CFU has also begun making contacts with qualified technical service providers serving Iowa and has begun evaluating resources needed for offering expanding its incentives and services for comprehensive, whole-building new construction projects and other customized projects in 2011 or years beyond.

Building Operator Certification and Other Trainings

CFU provides a $250 rebate upon completion of either Level I or Level II Building Operator Certification program, which is sponsored jointly by Iowa's investor-owned utilities and the Iowa Energy Center and administered by the Midwest Energy Efficiency Alliance. CFU plans to market the program more actively and will reassess rebate levels it offers to its customers in future years. Due to its small base of industrial and large commercial customers, CFU does not anticipate a large number of potential participants in this program each year.

CFU also learns of other training opportunities through collaborative exchanges such as IAMU's membership in PIE^2, the Partnership for Industrial Efficiency, the American Public Power Association (APPA), and other partnerships. CFU plans to market these opportunities more aggressively to its key accounts in coming years.

For more information about communication and educational opportunities for CFU's nonresidential customers, please see the section called "Marketing, Education, and Related Initiatives".

Internal Processes

CFU is currently working on streamlining its administrative processes for processing rebates, loan applications, and verifying energy efficiency savings. Streamlining will allow for CFU to expand its rebate offerings.

Database Centralization

CFU is currently working to more fully interface its energy efficiency program information with its customer billing software. This will allow customer services, energy services, and other CFU departments to access customer's energy efficiency files more easily along with all other billing and customer information. Given that CFU has data for several services – water, electricity, natural gas, cable, and internet – CFU believes merging these two sources of information will better help CFU in the following areas:

1) Identification of the truly highest users – those using the highest levels of electricity, natural gas, and/or water – to target for energy efficiency improvements;
2) Streamlined process for identifying customers to follow up with after they have had CFU energy audits or other energy-related appointments;
3) Improved opportunities for customer services department to inform customers who call CFU with other utility questions about energy efficiency programs and identify potential program participants
4) Streamlined process for future measurement & verification needs
5) Enhanced data security: By storing these records in CFU's central software, this will ensure accurate participation records are maintained years after they occur. CFU's main facilities were flooded during June 2008, forcing CFU Energy Services to evacuate the premises for several months. Because of this event, some customer records from energy efficiency programs in earlier years were misplaced for several months.

CFU initially hopes to complete this process by the end of 2011.

Customer Services and Phone Support

Periodic meetings are held with the customer service department to discuss changes in Energy Services programs. As they are the primary contact point for all customer inquiries about water, wastewater,

cable, internet, natural gas, and electricity services, CFU's customer services plays a vital role in identifying customers who are eligible for CFU's low and fixed income weatherization programs and all other CFU energy efficiency programs.

When customer services staff encounter customers with technical energy or equipment questions, they are transferred to the CFU Energy Services division. Customers can call or contact CFU Energy Services staff with questions about the following types of topics:

- Energy efficiency and renewable energy general topics
- Energy efficient products and building materials – where to purchase them and technologies available for specific projects customers are working on
- The availability of different CFU rebates and federal tax credits or other funding opportunities
- Safety questions about gas appliances and weatherization materials
- Questions about costs of running variance appliances
- High bill complaints

Staff answer questions, mail additional materials, and advise customers about which programs and services CFU has available to help them implement energy efficiency projects.

Customer/Contractor Reimbursement and Application Processes

CFU currently issues checks to customers that participate in CFU's rebate programs. During 2010-2012, CFU plans to further investigate the effectiveness of different methods of repayment, including varying the time for processing customer checks and applications, direct contractor and City of Cedar Falls reimbursement options, and using bill credits instead of checks to repay customers.

CFU expects and encourages local contractors and trade allies to help customers complete their rebate application forms, and works to keep their forms as straightforward as possible, while ensuring that enough information is gathered so CFU can ensure meaningful and accurate estimates of energy impacts from their programs. CFU is also investigating different online application methods that customers could use as an alternative to paper based forms.

Evaluation, Measurement & Verification

CFU will evaluate protocol for more formal measurement & verification services during 2011 and beyond. As CFU develops its more customized nonresidential and residential programs CFU will have a more formal idea of the scope and breadth of the requirements and budgets necessary for an EM&V program that is suitable for its service territory. Residentially, CFU currently verifies 100% of new construction projects and HVAC equipment rebates through its residential equipment program.

Marketing, Education, and Related Initiatives

Residential Trade Ally Education & Outreach

In conjunction with the Center on Sustainable Communities (COSC), CFU plans to host an educational training program in February 2010 for Cedar Valley area HVAC contractors. The multi-day event will provide contractors with training and education about quality HVAC installation. The training is through COSC's *Re-Building a Sustainable Iowa* funded by the Iowa Department of Economic Development and the U.S. Department of Housing and Urban Development for educational programming on sustainable building practices.

In addition to other areas and communities throughout the Cedar Valley, CFU hopes this training will benefit North Cedar, an area of the City of Cedar Falls that was severely flooded during the floods of 2008. Although some of the area businesses and homes have rebuilt successfully, restoration remains a long effort for many of the area's former occupants, who are CFU retail customers.

CFU will also release information about its 2010 program rules to all local trade allies through CFU's Contractor Listing Program, which is CFU's new contractor program for trade allies who are interested and qualified to provide energy efficiency services, materials, and equipment for CFU customers. In this program, insulation contractors receive compensation directly from CFU for projects for participating customers. Additionally, all participants will receive updates from CFU about future program changes and contact information for all participating contractors will be made accessible to CFU customers who are trying to implement various energy efficiency projects.

Advanced Diagnostics for Residential and Multifamily Customers

CFU has offered watt meter checkouts, blower door and thermal imaging services for customers since before 1990, and have more recently begun offering flow hood services through a RESNET-accredited energy rater on-staff. *None of these services are conducted on every audit;* they are primarily recommended in cases of difficult-to-diagnose comfort issues or a strong degree of interest from the customer. Depending upon the particular need or building type, different combinations of these tools are utilized to assist the customer.

CFU has historically considered these services to be an educational program, as CFU does not currently offer rebates based on the outcomes of these diagnostics and the main objective has been to educate customers about their properties. As indicated in the Residential Program Portfolio Sector, CFU plans to evaluate the feasibility of offering a performance-based program in 2011 or later. At that time, these advanced diagnostics may become part of a different residential program. Diagnostics that are offered as part of CFU's weatherization assistance pilot will be accounted for separately.

Below is a basic description of the advanced diagnostics currently offered under this educational program. In the summer of 2010, CFU plans to start charging $25 for each of these services (except for watt-meter checkouts).

Blower Doors

Average number conducted per year: 25-50

These are conducted throughout the year. The customer is present during the time the test is conducted, in order to identify areas of high leakage, and the customer is sent a letter with the measured air leakage, air changes per hour (ACH), and estimated cost of air leakage. In some cases, CFU also provides a follow-up letter to the customer identifying problem spots and steps the customer can take to correct the problems.

Thermal Imaging

Average number conducted per year: 20-50 per year.

These are conducted in winter months, when the thermal contrast is greatest between conditioned space and the temperature outside. CFU uses a thermal imaging camera in order to identify areas of thermal bypasses, poor insulation, and heat loss throughout a customer's home, primarily in areas of the home which the customer has identified as having comfort concerns. The customer is traditionally present at the time of the thermal imaging to help CFU target areas to scan and to make a visual connection with areas of greatest heat loss in their home. CFU often sends imaging pictures or summary letters back to the customer after the scan has been conducted, along with a letter summarizing areas for energy improvement.

Flow Hoods

Average number conducted per year: Approximately 20 per year.

These are conducted throughout the year as time permits. The customer is present during the time the initial flow hood is conducted and CFU provides follow-up analyses and suggestions for improvement. An important value to the customer is being able to witness firsthand which supply returns or areas are causing comfort issues for them. Additionally, CFU can and does routinely conduct follow-up flow hood tests to determine whether problems have been corrected or improved.

Watt Meter Checkouts

Average number loaned out per year: 30

These watt meters, which record kWh and kW consumption through standard household electrical outlets, are loaned out to residential customers at no charge. Customers can use them to monitor power consumption of various household appliances, space heaters, and electronics and learn about the amount of power they are consuming.

Duct Blasters

These are available to contractors at a fee through CFU's HERS rating service for residential new construction. More information is available in the Residential Energy Efficiency Portfolio section.

Cedar Falls Energy Action Network

The City of Cedar Falls has taken the initiative to form the Cedar Falls Community Energy & Environment Network. The mission of the network is to create a community with a more sustainable quality of life by fostering a network of advocates for energy efficiency, renewable energy, and environmental improvement who will guide the development and implementation of a long-term local energy action plan, engaging key stakeholders and leading cultural and behavioral change in our community. The goal is to develop and implement strategies that will result in:

1) Improved quality of life based on energy and environmental factors
2) Significant energy efficient improvement in:
   a) City infrastructure and properties
   b) Residential, commercial, and industrial buildings
   c) Transportation
   d) Recreation
3) Significant reduction in Cedar Falls' reliance on fossil fuel sources of energy and increased usage of renewable energy sources
4) Waste reduction

Along with CFU, the network currently includes the Mayor of Cedar Falls, three City Council members, Cool Congregations, University of Northern Iowa, Cedar Falls Public Schools, the UNI Center for Energy & Environmental Education, City of Cedar Falls staff, Iowa Green AmeriCorps, Cool Cities, and several interested citizens representing architects, contractors, and landlords. Network members examine and act upon energy conservation and environmental initiatives including smart growth, community planning, transportation planning, social marketing and education, strengthening city's energy codes, more incentives for conservation and renewable energy, and public projects demonstrating efficiency and renewable energy applications.

TV and Internet Resources

Television Advertisements and Local-Access Shows

Since CFU is also a communications utility that offers cable television services, CFU utilizes the following television advertisements.

- 10 advertisements have been produced featuring energy efficiency tips, "do-it-yourself" installation of energy efficient products, information about CFU rebate programs, and an invitation to call for a free energy audit. These ads run throughout the year on 52 cable TV

networks. They also run on local broadcast stations during selected sports events. The retail value of this advertising is approximately $25,000 per year.

- TV advertising is produced and aired for special energy efficiency promotions, such as CFU's recycling day for incandescent holiday lights held in November, 2009.
- 10 advertisements are run regularly on 25 cable TV networks
- A message advertising CFU's free audits runs at the top of the program guide channel
- A message advertising CFU's free audits runs on the local weather channel
- CFU produces a television show, *Currents Up Close*, on which local, regional, and national energy issues are discussed and Q&A sessions about energy efficient technologies occur.

Website

CFU's website is visited more than 100,000 times per month. Much of the web traffic is generated by customers visiting the site to check their e-mail (Internet service is provided by CFU). To leverage this web traffic, homepage messages and banners about energy efficiency programs direct visitors to energy efficiency information elsewhere on the site. All CFU energy efficiency programs are described at www.cfu.net/save_energy.php. The new website will be online in early 2010, and will contain more and better information about energy efficiency.

ENERGY STAR® Partnership

In 2009 CFU submitted an application to become an ENERGY STAR Program Sponsor in the Consumer Product Market, and is currently an ENERGY STAR Partner.

Targeted Customer Communications and Events

Key Account Communications and Events

CFU plans to increase communications with large customers about implementing energy efficiency improvements and the availability of energy efficiency training, funding, and tax credit opportunities. To aid in this effort, during 2009 CFU began tracking SIC and NAICS codes, in order to better identify and target the specific types of industries and large customers it serves.

The primary means of communication with key accounts are personal, phone or e-mail contact by CFU's key accounts representative, who currently communicates on a regular basis with many of the CFU's larger industrial and commercial customers. A key accounts seminar in January 2010 will also provide large customers with information about energy efficiency opportunities.

In January 2010 CFU and Waverly Light & Power are among those sponsoring the 2010 Green Building Seminar, an educational event hosted by the Greater Cedar Valley Alliance in Waterloo. The focus of

this event is to provide information to area businesses about funding and resources for improving efficiency and sustainability of existing facilities and new construction.

CFU Energy Fair

Every fall CFU holds its annual Energy Fair and appreciation event, complete with displays and cookout for customers. Local contractors and trade allies exhibit, as well as staff from all CFU utility services and for children, and the Green Earth Magic Show, which features a magician who promotes energy efficiency and sustainability. In 2009 an estimated 1,100 adults (and many of their families) attended, as well as about 20 local trade allies who provide a variety of expertise about energy efficiency resources available for CFU customers.

Public Speaking Engagements

Throughout the year, CFU staff spoke at a variety of state and local civic organizations throughout the year. In 2009 organizations included:

- Cool Congregations
- Iowa Association of Municipal Utilities
- Local faith-based organizations
- Hawkeye Community College
- University of Northern Iowa student groups
- Kiwanis Club

CFU staff serve in a variety of groups on a local and statewide basis, including but not limited to the City of Cedar Falls Heating Board, the Iowa Association of Municipal Utilities Energy Efficiency committee and Board of Directors, the Cedar Falls Energy Action Network, UNI Campus Energy Efficiency Taskforce, City Weatherization Council, and the Iowa Association for Energy Efficiency. CFU was also a regular participant in 2009 stakeholder meetings held by the Office of Consumer Advocate.

New Resident Outreach

CFU sends personalized letters to all new residents in the CFU service territory advertising CFU's energy services and the CFU House Calls program, and includes information about efficiency rebate programs in the new customer welcome packet. CFU has also met personally with all local realtors and provided them with welcome packets advertising CFU's House Calls walkthrough audits and energy services to new homeowners.

Direct Mail and Customer Newsletter

CFU utilizes the following direct mail advertisements.

- CFU makes annual direct mailings to all customers advertising CFU Energy Services. In 2009 CFU also targeted 3 different neighborhoods with direct mail for "neighborhood blitz" audit promotions.

- The CFU customer newsletter contains four features/testimonials per year that feature local customers who have participated in CFU's energy efficiency programs. Due to CFU's small customer base, CFU believes testimonials are especially effective because customers often personally know the featured residents. These energy efficiency articles also run in a City of Cedar Falls quarterly publication mailed to all Cedar Falls residents.

CFU and Customer Grant Applications

CFU applied for federal stimulus funding for two projects in 2009:

1) **U.S. Department of Energy** – CFU applied to the Department of Energy for funding to install advanced metering infrastructure (AMI) throughout its entire service territory. CFU proposed to use the AMI in order to establish real-time, dynamic pricing for its entire service territory after a test period, with rates and pricing schemes determined after the results of the test period. Although CFU's project was not selected by the Department of Energy for funding; CFU remains interested in future exploration of AMI and dynamic pricing alternatives for its customers.

2) **Iowa Office of Energy Independence State Energy Program** – In conjunction with the University of Northern Iowa, CFU submitted an application to the State Energy Program for funding an innovative project for conducting a thermal imaging flyover of the City of Cedar Falls. The UNI Department of Geography has recently conducted a similar flyover of the UNI campus and has the expertise to coordinate the flyover and process the imagery. CFU proposed to host the GIS-compatible imagery on a local server for a multi-year period. This would allow residents, customers, and other internet users to search by address or city quadrant and access thermal images of properties in Cedar Falls through a publically accessible website. CFU believes this is an innovative way of using electronic imaging capabilities to raise public awareness and reduce anonymity about major sources of heat loss in the buildings in its service territory. As of December 7, 2009, CFU received notification that it was awarded $185,047 in funding from the Iowa Office of Energy Independence State Energy Program for this project.

CFU also works to write letters of endorsement or provide matching funds or in-kind support for groups who approach CFU with an interest in applying for various sources of energy efficiency funding. As one example, CFU supported an application by the City of Cedar Falls to the Iowa Office of Energy Independence Community Grants Program in November 2009. This particular application proposed to engage neighborhoods, landlords, and businesses in Cedar Falls in strategies to reduce their energy consumption through behavior changes and implementing energy efficient improvements. Participating neighborhoods, landlords, and local businesses would be shown their energy consumption relative to others in their neighborhood, or in the case of businesses, would use other public symbols, such as a "thermometers" or public outdoor signage to show their energy usage. The results from this project would help customize modifications of the Cool Congregations model that would be more targeted to residential neighborhoods, rental properties, and some small businesses.

In future years CFU would also like to more thoroughly assist farm customers who are eligible for USDA grants, guaranteed loans, and combination loan/grant programs in completing and submitting applications for energy efficiency projects. CFU also plans to promote recent materials developed by the Iowa State University Extension, Iowa Energy Center, Iowa Farm Bureau Federation, CIPCO, IAEC, Consumers Energy, Alliant Energy, MidAmerican Energy, OEI, and USDA, in order to help CFU farm customers better track all on-farm usage.

Trees

CFU offers three different ways for citizens to utilize trees to reduce energy efficiency. The annual tree budget is $25,000.

- Plant-A-Tree: CFU has a program with local retailers where customers receive price deductions on qualified trees at the point-of-purchase retail location.

- Posterity Grant: CFU reviews applications from individuals, non-profit organizations, businesses, city agencies, schools, and civic groups. Grants are awarded for 50% of the tree stock costs, up to $75 per tree. Applications must include plans for the type, location, and number of trees that are to be planted, as well as project timing. This allows CFU to assist shade tree projects that will maximize the potential energy savings in the future.

- Neighborhood Grant: Any resident can apply on behalf of any neighborhood within Cedar Falls city limits. Applications and plans must include details on number of homes that plan to participate.

Holiday Light Recycling

CFU offers a disposal site for customers who wish to recycle incandescent holiday lighting. In some cases, participating customers can also enter into a raffle to win high efficiency LED holiday lighting. Information is also available via CFU's website about high efficiency LED holiday lighting.

Student Education

CFU has a long history of working with the Cedar Falls School District to implement facility improvements. CFU has assisted the school district with auditing, evaluating, and implementing improvements including lighting, pool heating and ventilation, and geothermal heating and cooling applications. CFU has also provided incentives to the school district for qualified improvements.

CFU and the UNI Center for Energy and Environmental Education have also worked together with the Cedar Falls School District regarding student curricula and public awareness about the school's energy savings efforts. CFU is regularly invited to present energy efficiency information to Cedar Falls School

District students. Additionally, the CFU Energy Services department offers internships to qualified UNI students who have an interest in learning more about residential energy efficiency or are considering careers in energy-related industries.

Safety Inspections and Programmable Thermostat Installations

The CFU Division of Gas Operations conducts CO_2 and water heater venting inspections for hundreds of CFU customer premises annually. The division performs the following services:

- Tagging services, where dangerous gas equipment are identified and turned off
- Installation of programmable thermostats if assistance is needed
- Natural gas furnace cleaning and inspection
- Pilot light turnoff services for natural gas fireplaces
- CO_2 and combustion safety inspections
- Identification of potential customers eligible for City of Cedar Falls and CFU low and moderate income assistance program

These services are not directly included in the CFU energy efficiency plan, but are relevant to CFU's energy efficiency portfolio, especially for rebates and programs that deal with HVAC equipment, building shell, weatherization, and other major improvements.

Assessments

CFU makes annual remittances to the Iowa Energy Center at Iowa State University and the Center for Global & Regional Environmental Research at the University of Iowa equal to one-tenth of electric and natural gas retail revenues.

Part V: Appendices

Appendix 1: Iowa Code and Glossary of Assessment Terms

Iowa Code §476.6, Subsection 16, Paragraph c

c. (1) Gas and electric utilities that are not required to be rate-regulated under this chapter shall assess maximum potential energy and capacity savings available from actual and projected customer usage through cost-effective energy efficiency measures and programs, taking into consideration the utility service area's historic energy load, projected demand, customer base, and other relevant factors. Each utility shall establish an energy efficiency goal based upon this assessment of potential and shall establish cost-effective energy efficiency programs designed to meet the energy efficiency goal. Separate goals may be established for various customer groupings.

(2) Energy efficiency programs shall include efficiency improvements to a utility infrastructure and system and activities conducted by a utility intended to enable or encourage customers to increase the amount of heat, light, cooling, motive power, or other forms of work performed per unit of energy used. In the case of a municipal utility, for purposes of this paragraph, other utilities and departments of the municipal utility shall be considered customers to the same extent that such utilities and departments would be considered customers if served by an electric or gas utility that is not a municipal utility. Energy efficiency programs include activities which lessen the amount of heating, cooling, or other forms of work which must be performed, including but not limited to energy studies or audits, general information, financial assistance, direct rebates to customers or vendors of energy-efficient products, research projects, direct installation by the utility of energy-efficient equipment, direct and indirect load control, time-of-use rates, tree planting programs, educational programs, and hot water insulation distribution programs.

(3) Each utility shall commence the process of determining its cost-effective energy efficiency goal on or before July 1, 2008, shall provide a progress report to the board on or before January 1, 2009, and complete the process and submit a final report to the board on or before January 1, 2010. The report shall include the utility's cost-effective energy efficiency goal, and for each measure utilized by the utility in meeting the goal, the measure's description, projected costs, and the analysis of its cost-effectiveness. Each utility or group of utilities shall evaluate cost-effectiveness using the cost-effectiveness tests in accordance with subsection 14 of this section. Individual utilities or groups of utilities may collaborate in conducting the studies required hereunder and may file a joint report or reports with the board. However, the board may require individual information from any utility, even if it participates in a joint report.

(4) On January 1 of each even-numbered year, commencing January 1, 2012, gas and electric utilities that are not required to be rate-regulated shall file a report with the board identifying their progress in meeting the energy efficiency goal and any updates or amendments to their energy efficiency plans and goals. Filings made pursuant to this paragraph *"c"* shall be deemed to meet the filing requirements of section 476.1A, subsection 1, paragraph *"g"*, and section 476.1B, subsection 1, paragraph *"l"*.

Summary of Basic Assessment of Potential Terms

For CFU Board of Trustees, CFU customers, and other interested parties

Adapted from ECW (2009) and NAPEE (2009)

BASIC TYPES OF ENERGY EFFICIENCY POTENTIAL

Type One: Technical potential: A measurement of the theoretical maximum level of potential energy savings, assuming immediate implementation of all technologically feasible energy efficient technologies regardless of cost-effectiveness.

Type Two: Economic potential: This is a subset of technical potential that assumes immediate implementation of the most cost-effective energy efficient technology for any given application. In the ECW study, societal test was used to identify the subset of measures that are cost-effective. These measures were included in the estimates of economic potential.

Type Three: Achievable potential: Achievable potential is a measurement of the level of savings that could realistically be achieved by energy efficiency programs within a specified time horizon, given limiting factors such as cost-effectiveness, capital constraints, the useful lifetime of existing installed equipment, program ramp-up time, and other barriers that affect adoption of energy efficiency measures. During and after this stage, rebate program rules, incentive amounts, and other planning occurs.

TWO COMMON APPROACHES USED TO ESTIMATE THE ENERGY EFFICIENCY POTENTIALS ABOVE

Bottom-up approach: The bottom-up approach begins at measure level, multiplying the costs and savings associated with deploying each energy efficient measure by the number of units of each measure expected to be installed during the study period, and aggregating the results. As end use consumption is relatively homogeneous within the residential sector, ECW and CFU used this approach to estimate CFU's residential energy efficiency potential.

Top-down approach: The top-down approach begins with a forecast of energy sales over the study period, and disaggregates this forecast within each sector by market segment and end use. Potential is then allocated across each market segment and end use. Given the variability in energy end use and technology installations across market segments, CFU and ECW used this approach to assess commercial, industrial, and agricultural potential.

COST-EFFECTIVENESS

The California Standard Practices Manual contains tests in order to analyze the cost-effectiveness of demand-side management programs from a variety of perspectives. Two of the tests are summarized below. Three other major tests are the Utility Cost Test, Participant Cost Test, and Rate Impact Measure Test (RIM). For more information please consult (NAPEE, 2009) or the American Public Power Association's Public Power Guidebook (www.ecw.org/publicpowerguidebook/).

Total Resource Cost Test (TRC): This test compares benefits to society as a whole (avoided supply-side cost benefits, additional resource savings benefits) with the participant's cost of installing the measure plus the cost of energy efficiency program administration (non-incentive costs). Incentives are

considered a transfer payment from program to participant and thus are not explicitly accounted for in the calculation.

Societal Cost Test (SCT): The SCT is similar to the TRC, except it also explicitly quantifies externality benefits not represented in market prices and other non-energy benefits (e.g., improved health/productivity). In Iowa this means that the avoided natural gas costs were inflated by 7.5% and the avoided electric costs were inflated by 10%, as outlined in Iowa Administrative Code. All costs used in the calculation remain the same as in the TRC test. This is the test that Iowa's investor-owned utilities (Quantec, 2008), IAMU, and CFU have used when assessing levels of economic savings potential.

Appendix 2: Feasibility/Qualitative Screening for Residential and Small Commercial Assessment of Potential

CFU used the results of the assessment of potential to help plan its 2010 rebate programs. During this planning process, CFU conducted a feasibility screening of many common residential and some commercial measures that were included in the ECW assessment. This screening was based on CFU's past program experiences, conversations with local trade allies and the Iowa Energy Center, and demographic data about existing residential customers. The common measures listed below were removed from CFU's assessment of potential or initial 2010 rebate programs for a variety of factors, which are summarized below.

Measures in Original Study	Comments	Passed or Failed CFU Economic Screening (Societal Benefit Cost Test)
Heating System Fuel Switch – Electric to Gas	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Range/Oven Fuel Switch – Electric to Gas	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Water Heater Fuel Switch – Electric to Gas	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Dryer Fuel Switch – Electric to Gas	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Heat Pump Water Heater replacement for natural gas water heater	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Geothermal Heat Pump replacements for gas heating systems	Fuel-switching was not included in assessment of potential	N/A – excluded from both economic and achievable potential
Ceiling Fan Efficiency Upgrade	Candidate for inclusion in CFU's rebate programs later in 2010-2012; first priority given to expanding CFU's lighting program. CFU will offer rebate in 2010 for ENERGY STAR qualified ceiling fan light kits.	Passed
Central AC Tune Up	Candidate for inclusion in CFU's rebate programs later in 2010-2012.	Passed
ENERGY STAR Dehumidifiers	CFU offers dehumidifier recycling rebate to prioritize retirement of	Passed

	old, inefficient dehumidifiers.	
ENERGY STAR Room Air Conditioners	CFU currently offers room air conditioner recycling to prioritize retirement of old, inefficient room air conditioner units.	Passed some residential market segments
Doors	Candidate for inclusion in CFU's rebate programs later in 2010-2012.	Passed some residential market segments
Windows	Did not pass cost-effectiveness screening; CFU is currently prioritizing other building shell measures	Failed
ENERGY STAR Refrigerators and Freezers	CFU customers can receive appliance recycling incentives for disposal of working refrigerators and freezers. Also required for residential new construction program.	Passed some residential market segments
LED Bulbs, purchased 2012 and 2018	Candidate for expanded rebates in CFU's programs later in 2010-2012; currently CFU provides incentives for options for this product for residential new construction and for nonresidential customers.	Passed
Direct load control for air conditioners and water heaters	CFU has excess sources of supply side capacity available; priority is currently on residential projects that reduce energy and capacity savings on a year-round basis.	Passed
Solar DHW	Candidate for inclusion in CFU's programs later in 2010-2012; currently CFU has provided financing for this equipment.	Failed
Water Heater Blanket, Electric and Gas DHW	CFU is prioritizing other measures available for reducing water heater energy usage – faucet aerators, gas water heater setback, and low-flow showerheads	Passed
Occupancy Sensors/Exterior Lighting	Candidate for inclusion in CFU's	Passed some residential segments

Controls	programs later in 2010-2012.	
Radiant Barriers	CFU is currently prioritizing other building shell measures with high savings potential – insulation and infiltration reduction measures.	Passed
Gas-Condensing Water Heater – Natural Gas	CFU is prioritizing all types of natural gas water heaters with EF 0.82 or higher.	Failed
Natural Gas Water Heater (EF 0.62)	CFU is prioritizing all types of natural gas water heaters with EF 0.82 or higher.	Passed
Desuperheaters	According to area contractors, desuperheaters are already part of the standard equipment on the type of residential scale geothermal heat pumps that are most commonly installed in the CFU service territory. CFU's current incentives for both new and replacement geothermal systems are high enough to help defray costs for connecting desuperheaters, purchasing water heaters, or other associated costs.	Passed
Programmable Thermostats	Candidate for inclusion in CFU's rebate programs later in 2010-2012, especially for low-income and multifamily programs.	Passed
Heat Pump Water Heater	Candidate for inclusion in CFU's rebate programs later in 2010-2012.	Passed
Boiler Controls	Incentives available for qualified properties through CFU's custom efficiency incentives program.	Passed
Brushless Permanent Magnet motors ("ECM motors")	Candidate for inclusion (see below); currently required for participants in CFU's new home construction program	Failed
Fryers	Candidate for inclusion in CFU's rebate programs in 2011 or later.	Passed some commercial segments
Steam Cookers	Candidate for inclusion in CFU's	Passed

	rebate programs in 2011 or later.	
Hot Food Holding Cabinets	Candidate for inclusion in CFU's rebate programs in 2011 or later.	Passed

Variable Speed Brushless Permanent Magnet motors (aka "ECM motors") for furnaces

CFU has traditionally required that forced-air natural gas furnaces contain variable speed BPM ("ECM") motors in order for customers to receive a rebate for a forced-air natural gas furnace. However, after discussions with the Iowa Energy Center and consulting other technical resources , it appears that these motors are especially advantageous for duct systems that possess low duct static pressure differences (i.e., lower than 0.5 in. water (125 Pa)).

One study recommended that "utility rebate programs ensure that rebates are provided for using a BPM blower instead of a PSC blower in multi-speed systems and/or systems that have a field measured low static pressure difference below 0.5 in. water (125 Pa)" (LBNL, 2007). This study also notes that "two-stage equipment that operates for a significant fraction of the year at lower capacity and airflow has the biggest potential benefit from the use of a BPM blower".

Based on field experience from its 5 Star Homes design assistance, current furnace program, HERS rating services, and advanced diagnostics services for new and existing homes, CFU believes it is unlikely that many of the older homes in its service territory have a system static pressure of 0.5 in. water (125 Pa) or lower.

CFU will continue to require these motors in its high efficiency furnaces for its 5 Star Homes program because the duct systems in these CFU homes typically are more likely to have lower static pressures and because two-stage furnaces are required for participation in this program. As new information becomes available, CFU will also continue to evaluate whether to reinstate incentives for HVAC systems beyond its new construction program and may try to evaluate this more quantitatively in its own service territory.

Appendix 3: References

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Appendix 4: CFU Customer Survey Instrument

The CFU Marketing Department conducts annual residential customer satisfaction surveys in conjunction with the University of Northern Iowa's Strategic Marketing Services. The latest customer survey was conducted in mid-2009 and included several questions about energy efficiency. The questions pertaining specifically to energy efficiency and demographics have been included below. This survey was a resource for general, non-statistical reference about residential energy efficiency in the CFU service territory, along with the other resources mentioned throughout this assessment.

Which of the following have you done to reduce the amount of energy you use at home?

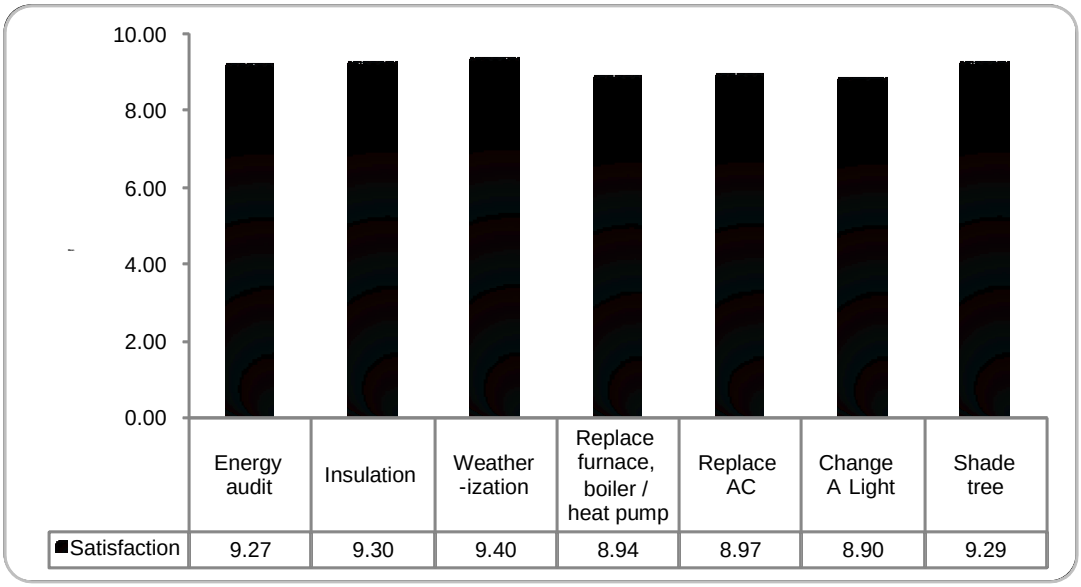
(N, 400)	Percent
Reducing plug loads by turning electronics completely off when not in use	49.8%
Drying laundry outdoors	18.3%
Closing vents in unused rooms	48.8%
Washing clothes in cold water	56.8%
Reducing water heater temperature setting	43.8%
Installing low-flow shower heads	34.5%
Reducing indoor and/or outdoor lighting	44.8%
Using a programmable thermostat to set back heating/cooling levels automatically	61.8%
Replaced incandescent bulbs with CFLs	76.8%
Planted shade trees for energy efficiency benefits	29.5%
Other	15.8%
None of the above	1.3%

Which of the following CFU energy efficiency programs have you used in the past?

(N, 400)	Percent
Free energy audit	20.8
Home insulation	7.5

Home weatherization	1.3
Furnace, boiler or heat pump replacement	22.0
Air conditioner replacement	19.0
Change A Light, Change The World	18.8
Shade tree discount	14.8

Please rate your level of satisfaction with each of the programs you have used.



For the programs you have not used, please indicate the primary reason why you haven't tried them.

	Not needed	Too costly even w/rebate	Unaware CFU offered	Need more info to decide	Some other reason
Free energy audit	39.3	4.7	11.5	22.0	22.4
Insulation	50.8	8.4	12.6	12.9	15.2
Weatherization	48.4	6.1	22.6	13.4	9.5
Replace furnace, boiler, heat pump	66.3	8.7	7.7	6.7	10.7
Replace AC	65.5	9.4	7.5	6.8	10.7
Change A Light, Change the World	36.5	3.9	29.6	10.4	19.5
Shade tree discount	56.4	6.1	15.2	7.3	14.9

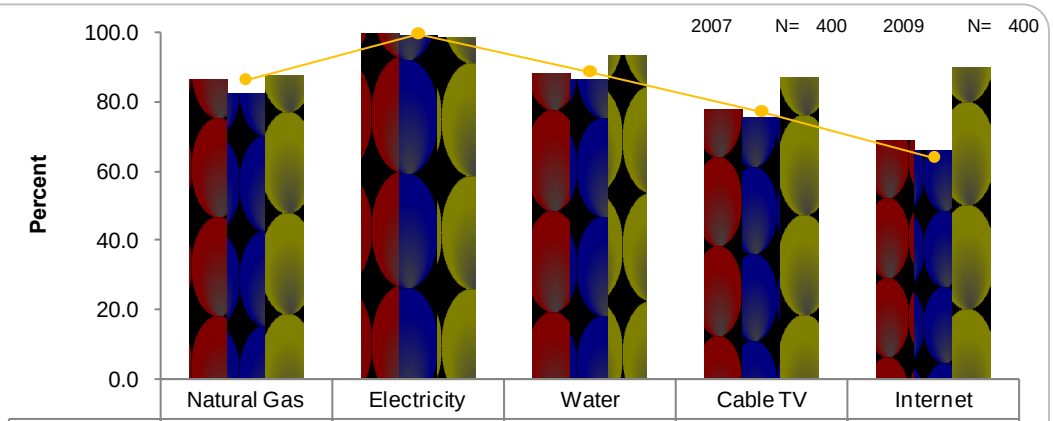
Please rank the top three reasons why you took action to save energy in order of importance to you, with one being most important and three of lesser importance.

	N=	# of Times Ranked 1st	Mean
To save money on electric/gas bills	363	207	1.58
To practice environmental responsibility	189	46	2.13
To take advantage of CFU incentive programs and/or the federal energy efficiency tax credit	157	24	2.35
To make my home more comfortable	255	41	2.26
I had to replace equipment, appliances and/or electronics that no longer worked and selected high-efficiency replacements	224	78	2.03

From which of the following sources do you recall seeing information about the benefits of energy conservation, or ways to save energy, during the past 12 months?

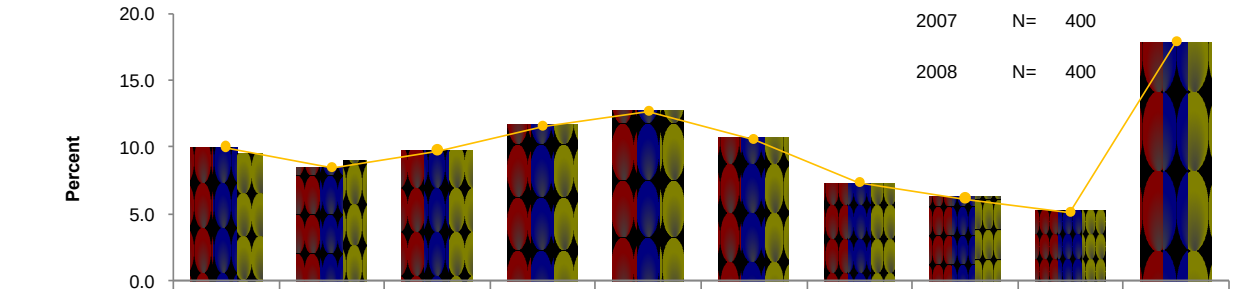
N=400	Percent
CFU	85.8
Vendors	46.5
News media	73.3
Friends and/or family	31.0
I do not recall seeing information from any of these sources in the past 12 months	3.8

Which of the following services do you currently receive from CFU?



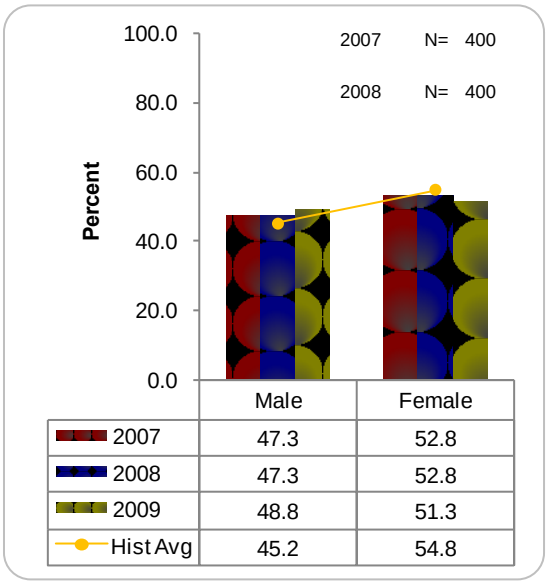
	Natural Gas	Electricity	Water	Cable TV	Internet
2007	86.5	100.0	88.5	77.8	68.5
2008	82.5	99.5	86.5	75.8	65.8
2009	87.5	98.8	93.5	87.0	90.0
Hist Avg	86.7	99.8	88.7	77.3	63.9

To which of the following age groups do you belong?



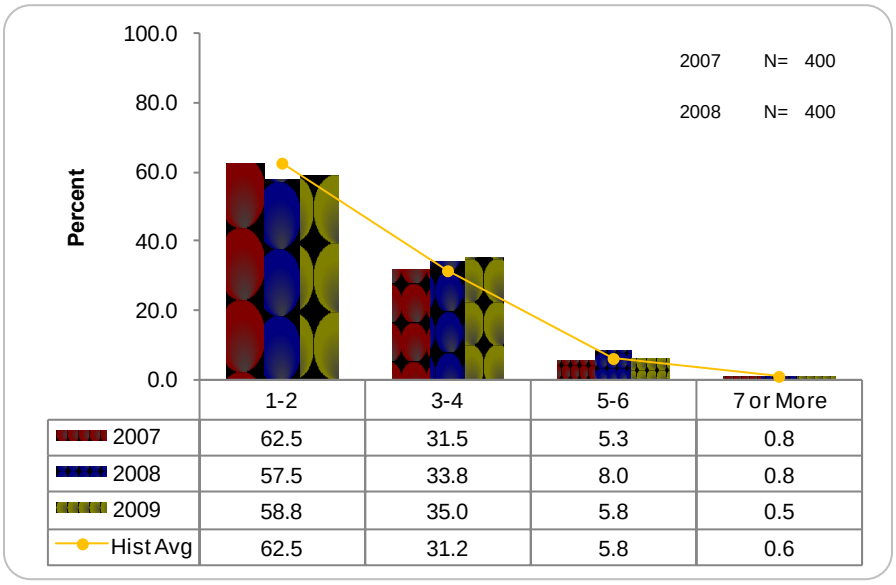
	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 or Above
2007	10.0	8.5	9.8	11.8	12.8	10.8	7.3	6.3	5.3	17.8
2008	10.0	8.5	9.8	11.8	12.8	10.8	7.3	6.3	5.3	17.8
2009	9.5	9.0	9.8	11.8	12.8	10.8	7.3	6.3	5.3	17.8
2000 Census	10.0	8.5	9.8	11.6	12.7	10.6	7.4	6.2	5.2	17.9

Please indicate your gender.



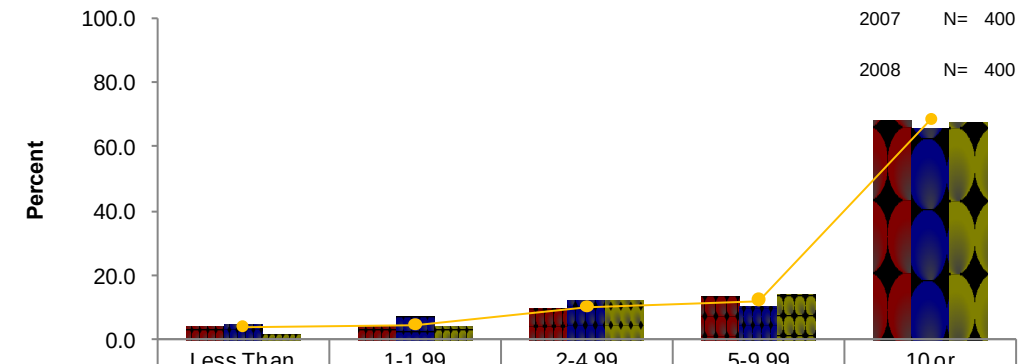
	Male	Female
2007	47.3	52.8
2008	47.3	52.8
2009	48.8	51.3
Hist Avg	45.2	54.8

How many people live in your household?



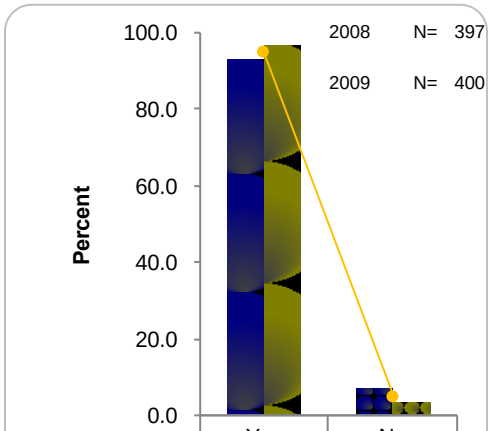
	1-2	3-4	5-6	7 or More
2007	62.5	31.5	5.3	0.8
2008	57.5	33.8	8.0	0.8
2009	58.8	35.0	5.8	0.5
Hist Avg	62.5	31.2	5.8	0.6

How long have you lived in the Cedar Falls area?



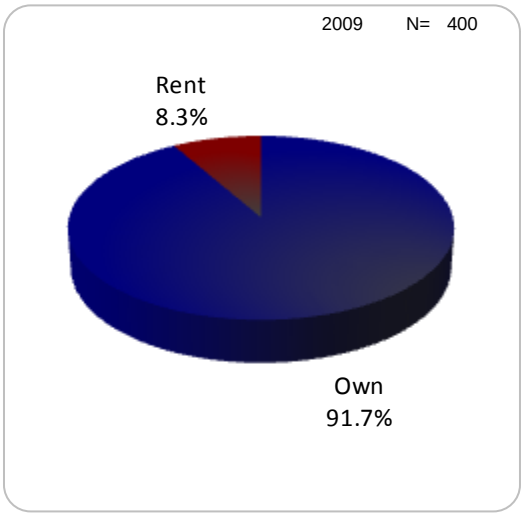
	Less Than One Year	1-1.99 Years	2-4.99 Years	5-9.99 Years	10 or More Years
2007	4.5	4.3	9.5	13.5	68.3
2008	4.8	7.0	12.3	10.3	65.8
2009	1.8	4.3	12.3	14.0	67.8
Hist Avg	4.1	4.8	10.1	12.4	68.6

Do you live within the city limits of Cedar Falls?



	Yes	No
2008	93.2	6.8
2009	96.5	3.5
Hist Avg	94.9	5.1

Do you own or rent your home?



Appendix 11

Muscatine Power & Water
Supplemental Information

Muscatine Power & Water Energy Efficiency Narrative

We at Muscatine Power & Water realize the importance of the task at hand and are fully committed to it. We have had rebate programs designed to enhance energy efficiency for over 20 years. In that time we have learned that not only do we need to be committed but we need the support and commitment of our customers as well. Two of our largest Industrial customers make up roughly 50% of our native load which makes this a challenging task but not an impossible one! We are continuing to build relationships with all of our customers and will continue to strive for energy efficiency in all sectors. Through programs that we have developed, we hope to help with the educational process at all levels within our community. Muscatine Power & Water supports or administers the following educational and outreach programs. For more detail on any of these programs please visit the website: http://www.mpw.org/energize_muscatine.htm

Educational Programs

- **Muscatine High School Electrathon -** The goal of this citywide program is to promote the understanding and use of energy efficient transportation. MP&W is one of several sponsors supporting the Muscatine High School Electrathon Race Team. Students build an electric racecar from the ground up.
- **Iowa Energy Poster Contest -** The goal of this citywide program is to promote in 4th and 5th graders the understanding of energy efficiency and renewable energy. MP&W offers awards for first, second, and third place for best poster in the 4th grade and again for the 5th grade.
- **Junior Solar Sprint -** The goal of this citywide program is to promote the understanding and use of Renewable Energy and energy efficient transportation. MP&W sponsors a Junior High program where students build and race model solar cars.
- **Energy Efficiency Programs -** Every year MP& W provides the Muscatine School District with Electrical and Water conservation materials.
- **Energy Efficiency Scholarship Award -** The goal of this program is to promote the study of energy efficiency. MP&W offers a scholarship to two graduating seniors from Muscatine High School who demonstrates an interest in studying energy efficiency issues in college.
- **Energy Efficiency Science Fair Award -** The goal of this program is to promote the study of energy efficiency. MP&W offers awards for the first, second, and third best science fair projects that deal with energy efficiency or renewable energy.
- **eco@home Magazine -** We have budgeted money to educate our Residential Electric and Water customers too. By providing quarterly publications of IAMU eco@home we are confident that we are reaching this sector as well.

Muscatine Branching Out (Tree Planting Program

We have been and will continue to be big supporters of the Trees Forever Program via Muscatine Branching Out. The goal of this program is to increase community wide energy efficiency through the planting of trees. The value of energy efficiency from properly planted trees drives our commitment to this program. In fact, Energy Efficiency is what drives all of our programs!

Residential Rebate Program consists of the following:

- **AC Tune Up** - The goal of this program is to increase the energy efficiency of residential central air conditioners by offering a rebate to reduce the cost of tuning up of air conditioners. Upon inspection of the AC unit the technician will fill out a rebate form that he will keep and turn into MPW. The rebate form will pay for the additional cost over $50 so that the customer will not have to pay more than $50.

- **CFL Rebate** - Rebate for any compact fluorescent light bulb; 50% of pre-tax purchase price.

- **Dishwasher Rebates** - ENERGY STAR rated; $50

- **Electric Dryers Rebates** - $25

- **Electric Range Rebates** - $25

- **Electric Water Heater Rebate** - 40+ gallons, Energy Factor (EF) 0.94+; $200

- **Ground Source Heat Pump Rebate** - The utility offers a $150 per ton rebate for a single stage ground source heat pump, and a $300 per ton rebate for a two stage ground source heat pumps. The customer is required to submit a copy of their sales receipt and a computer analysis of the system showing kWh & kW savings compared to existing HVAC system. The information provided must show tonnage use for heating and tonnage used for Air Conditioning. The customer is encouraged to purchase the most energy efficient model available for long term savings.

- **Refrigerator Rebates** – For ENERGY STAR rated refrigerators, the utility offers $75 with the proper disposal of their inefficient model.

- **Clothes Washer Rebates** - ENERGY STAR rated; $50

- **Window Rebates** - ENERGY STAR rated windows in all-electric homes or apartments; $25 per window

- **Room Air Conditioner Rebates** - ENERGY STAR rated units; $25

- **Central Air Conditioner Rebates** - SEER 14.0+; $150

Residential Energy Inspections/Audits

Residential Inspections are also part of our curriculum. The goal of this program is to increase customer awareness of energy efficiency opportunities in the home. The program consists of the Energy Services Advisor conducting residential energy audits and giving suggestions on ways to improve energy efficiency. This program provides the same information and materials as the previous program but also includes the installation of free compact fluorescent bulbs; low flow showerheads, and faucet aerators.

Also available are infrared scans and blower door tests. The goal of these options is to increase the energy efficiency of customers' homes and businesses. These have been done on a limited basis but this program should make them more assessable.

Energy Code Enforcement

The goal of this program is to enforce the energy code in new residential construction in Muscatine. This program assists builders by providing information on the energy code and providing checks to ensure new homes meet the code. Local contractors have also participated in other workshops throughout the years focusing on Energy Efficiency and Waste Reduction provided by Muscatine Power & Water.

Commercial and Industrial Prescriptive Incentives

- **Commercial Lighting** - Rebate is $200.00 per kW of demand reduction from changes in lamp and ballast wattage. Not to exceed $2,000 per account. Qualifying lights include:
  - T8 fixtures (electronic ballasts)
  - Metal halide and high pressure sodium fixtures
  - CFLs
  - T5 fixtures (electronic ballasts)

- **Industrial Lighting** - Rebate is $200.00 per kW of demand reduction from changes in lamp and ballast wattage. Not to exceed $2,000 per account. Qualifying lights include:
  - T8 fixtures (electronic ballasts)
  - Metal halide and high pressure sodium fixtures
  - CFLs
  - T5 fixtures (electronic ballasts)

- **Commercial and Industrial Geo Exchange** - The goal of this program is to reduce Commercial energy consumption by replacing inefficient furnaces with ground source heat pumps. The utility offers a $150 per ton rebate for a single stage ground source heat pump, and a $300 per ton rebate for a two stage ground source heat pumps. The customer is required to submit a copy

of their sales receipt and a computer analysis of the system showing kWh & kW savings compared to existing HVAC system. The information provided must show tonnage use for heating and tonnage used for Air Conditioning. The customer is encouraged to purchase the most energy efficient model available for long term savings.

- **Commercial and Industrial LED** - The goal of this program is to reduce commercial energy consumption by replacing inefficient incandescent exit signs with energy efficient LED Exit Signs. The utility offers a $15 rebate for each LED Exit Sign or bulb replacement kit installed. The customer is encouraged to purchase the most energy efficient model available for long term savings. MP&W's web page offers information on LED Exit Signs.

- **Commercial and Industrial Motor Challenge** - The goal of this program is to reduce commercial and industrial energy consumption by replacing inefficient motors with energy efficient motors. The utility offers a $200 per kW rebate for consumption reduction. The customer is required to provide a sales receipt and name-plate information on their motor. KW reduction and kWh reduction is determined by using the Motor Master software program using the information provided by the customer.

Commercial and Industrial Custom Programs

We have put a lot of time and effort into developing a winning Energy Efficiency Program. We have tried to think of every way possible to incentivize and motivate our customers to be efficient. The goal of this program is to increase energy efficiency in areas not covered by the other energy efficiency programs. The Energy Services Advisor and Director, Utility Relations will determine which projects qualify under this program.

Municipal Facility Improvements

Muscatine Power & Water takes great pride in energy efficient at our facilities as well. The goal of this program is to increase the energy efficiency of the city owned buildings, to which MP&W provides free electricity. This program consists of MP&W performing energy audits of the buildings and implementing cost effective measures. We have recently completed a Fan Upgrade Project that saves nearly 3.6 million kWh per year. We are investing in a Facility Lighting Project and a Geo-Thermal Project that will utilize better technology and reduce wasted electrical consumption. We are also heavily involved in the facilities within our community that we provide electricity at no cost. The customers are referred to as Free Book customers. The following also comes from our Program Description.

Commercial and Industrial Education

Since our utility rates are based on cost to serve, Industrial customers benefit from economies of scale and thus have lower rates than do our residential and commercial customers. We provide energy efficiency education and awareness to our customers, empowering them with the ability to make informed energy efficiency decisions. Utility rebates are used as an incentive to encourage our customer owners to implement new energy efficiency technologies. In January of 2000 MP&W applied for and received a Rebuild America grant from the Iowa Department of Natural Resources which we used to better organize and further our commercial and residential energy programs. Our future plan includes many of the same programs as years past, with continued emphasis on commercial audits, new residential construction and customer audits. Putting the customer first, Muscatine Power and Water will continue to evaluate and implement energy efficiency programs based on overall customer need, user preferences and overall Utility goals and objectives.

Solar Program

No kWh savings have been allocated in the Goals Report for our Solar Program. This program not only provides clean renewable energy but also serves as an educational tool to our customers. On our website we provide hourly, weekly, monthly and yearly data from our wind and solar projects.

Concluding Remarks

Muscatine Power and Water's Energy Efficiency Plan is an aggressive energy efficiency education and awareness plan. This plan was developed by examining existing generating capacity, energy efficiency programs, customer classes and customer needs. Muscatine Power and Water is in a somewhat unique situation. With adequate generating capacity projected into the future, energy efficiency programs in some cases do not prove cost effective in the strict economic sense. However, we feel that energy efficiency programs can have a substantial impact in our community in terms of education, awareness and quality of life. We have identified residential and commercial customers as the target audience for our energy efficiency programs.

Appendix 12

Waverly Light & Power
Supplemental Report on Energy Efficiency Goals, Measures, Cost-Effectiveness

Waverly Light and Power Energy Efficiency goals 2010-2014

Prepared for Board of Trustees, Waverly Light and Power

September 1, 2009

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Summary

Overview

Since 1992, Waverly Light and Power has devoted considerable resources to and been a leader in energy efficiency and conservation programs. This commitment to conservation has saved Waverly Light and Power and the community it serves over three megawatts of power.

Slowing load growth is a key component to rate stability for both the utility and its customers. Moreover, helping and encouraging customers to consume less power results in lower electric bills for many of WLP's customers. To date, over 4600 individuals, households, and businesses have partnered with WLP to reduce energy demand.

WLP continues to move forward as we plan for the upcoming five years and beyond. The diversity of programs is designed to maximize kWh reduction, participation, and cost effectiveness. The Iowa Utility Board with direction from the 2008 Legislative session request that all Iowa Utilities prepare its goals for future years. In the first quarter of 2009, the Iowa Association of Municipal Utilities contracted The Energy Center of Wisconsin to assess the potential savings for each municipal utility in Iowa. Their findings recommend a plan that results in a year over year load growth reduction of 1.1%. Our calculations expect us to achieve a 1.1% reduction by 2013. In 2014, we expect to achieve a 1.2% reduction in load growth.

Facility Projects

In addition to efficiency programs aimed to help customers, WLP strives to set the energy efficiency benchmark in its community by continuously making facility upgrades and improvements. In 2007, the HVAC system was upgraded from an all electric to a gas/electric system. WLP calculates the annual CO2 savings to be around 140 metric tons. In 2008, the main service center underwent a lighting retrofit. This led to a 1.93 KW reduction in load. These two projects alone reduced usage by almost 40%. WLP's goal is to undertake at least one facility efficiency project per year.

Cost Benefit Analysis Assumptions

Assumptions made while conducting the Cost Benefit Analysis are outlined in Table 1.

Table 1

Assumptions

Start Year	2010
End Year (default)	2014
Discount Rate (SCT)	4.81%
Discount Rate (UCT/RIM/TRC)	7.90%
Discount Rate (PCT)	7.90%
Line loss	5.82%
Measure Cost Escalator	2.25%
Electric Externalities Adder	10.00%
Administrative Cost Escalator	2.25%

Purpose

This document will outline energy efficiency goals for Waverly Light and Power for the calendars years 2010 through 2014. It will briefly describe existing and planned demand side management programs for the given years. It will also show projected participant numbers, costs, and kWh savings from each program as well as the WLP Demand Side Management program in aggregate. Projected costs, participant numbers, and kWh reduction figures are derived from past data as well as mathematical models. Projected load growth was provided by MEAN.

Program Descriptions

Appliance Rebates

Description

WLP will continue to offer rebates for the following appliances:

- Energy Star Refrigerators (20% or better)
- Energy Star Clothes Washers (2.00 MEF or better)

Efficiency standards for the appliances will be revised annually as efficiency improves. We plan that this popular program will continue to enjoy large participation among customers as well as contribute to meeting our efficiency goals.

Projected Performance

Year	Participants	Cost	kwh reduction
2010	215	$30,000.00	228975
2011	221	$30,900.00	235844
2012	228	$31,827.00	242920
2013	235	$32,781.81	250207
2014	242	$33,765.26	257713
totals	1141	$159,274.07	1215659

Cost Benefit Analysis

Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	46571	46571	79992	46571	65073
NPV Costs	38976	36434	10803	47873	49991
NPV Net Benefits	7595	10137	69189	-1302	15082
B/C Ratio	1.20	1.28	7.4	.97	1.3

Program Descriptions

HVAC Rebates

Description

The HVAC rebate program is vital to mitigating peak demand for the utility. WLP has a proven track record in regards to correctly sizing Air Conditioner and Heat Pumps in accordance with ACCA Manual J standards. Customers participating in this program not only help WLP in keeping peak demand low, the customer themselves save energy with the benefit of a more comfortable home environment.

WLP's current efficiency standards are set higher than State and National criteria. Our intent is to increase WLP's standards as technology allows.

- Air conditioners (15 SEER or better)
- Air to Air Heat Pump (15 SEER & 8.5 HSPF or better)
- Geothermal Heat Pump (3.3 COP or better)

Projected Performance

Year	Participants	Cost	kwh reduction
2010	60	$17,500.00	50820
2011	62	$17,826.00	52345
2012	64	$18,227.00	53915
2013	66	$18,637.00	55532
2014	68	$19,056.00	57198
totals	319	$91,246.00	269810

Cost Benefit Analysis

Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	162795	162795	123896	162795	228747
NPV Costs	97633	78471	41060	115804	125919
NPV Net Benefits	65162	84324	82836	46991	102828
B/C Ratio	1.67	2.07	3.01	1.41	1.81

Program Descriptions

New Home Building Program

Description

Building on the success of the Good Cents Program as well as advances in building efficiencies, WLP plans to introduce a revised new home building program in 2010. Rather than discounting the electric rate for ten years, the revised program will pay cash rebates for building new homes above Local, State and Federal energy efficiency standards.

WLP will offer two tiers of residential efficiency. To meet tier 1, the residence must meet a minimum set of building standards which exceed current building code in Bremer County and the State of Iowa. Tier 2 ,the residence must exceed the Tier 1 standards and have their home score less than 80 on the RESNET scoring system. Homes that achieve a score of 80 or less will receive the Energy Star designation along with an increased monetary incentive from WLP. The goal of the multiple tier structure is to maximize participation while continuing to forge ahead as a public utility leader in this program.

Projected Performance

Year	Participants	Cost	kwh reduction
2010	35	$50,000.00	21000
2011	40	$51,500.00	24000
2012	45	$53,045.00	27000
2013	50	$54,636.35	30000
2014	60	$56,275.44	36000
totals	230	$265,456.79	138000

Cost Benefit Analysis

Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	249260	249260	69479602	249260	353681
NPV Costs	326357	263426	133598	69743029	419822
NPV Net Benefits	-77097	-14166	69346004	-69493768	-66141
B/C Ratio	0.76	0.95	520	0.00	0.84

Program Descriptions

Solar Water Heater Program

Description

A newly introduced incentive program in 2009, the residential Solar Water Heater program stands to yield significant kWh savings for WLP, and participating customers. The intent of this program is to not only save energy, but to also reduce our customer's carbon footprint with a renewable energy resource.

Projected Performance

Year	Participants	Cost	annual kwh reduction
2010	6	$25,000.00	16800
2011	7	$25,750.00	19600
2012	10	$26,522.50	28000
2013	12	$27,318.18	33600
2014	15	$28,137.72	42000
totals	50	$132,728.40	140000

Cost Benefit Analysis

Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	30277	30277	52548	30277	40637
NPV Costs	254448	260679	39519	313227	318009
NPV Net Benefits	-224171	-230402	13030	-282950	-277372
B/C Ratio	0.12	0.12	1	0.10	0.13

Program Descriptions

Residential Enhanced Energy Audit

Description

New for 2010 will be the Residential Enhanced Energy Audit Program. This program goes beyond a typical energy audit in that WLP personnel will install energy efficiency measures while conducting a comprehensive energy audit in the home. Performing such tasks builds upon the classic 'educational' audit and ensures that every visit results in energy savings.

Projected Performance

Year	Participants	Cost	kwh reduction
2010	100	$57,972.00	162700
2011	200	$59,276.00	325400
2012	300	$60,610.00	488100
2013	400	$61,974.00	650800
2014	500	$63,368.00	813500
totals	1500	$303,200.00	2,440,500

Cost Benefit Analysis

Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	83176	83176	75508733	83176	109702
NPV Costs	288705	260849	87775	75769581	368642
NPV Net Benefits	-205529	-177673	75420958	-75686406	-258940
B/C Ratio	0.29	0.32	860	0.00	0.30

Program Descriptions

Inpowering Solutions Commercial Program

Description

WLP's In*Powering* Solutions(R) commercial efficiency program offers commercial clients a menu of energy efficiency options from which to take advantage. WLP works with commercial clients to help them identify possible efficiencies in their facilities and pay a rebate on each KW of load reduced. Moreover, WLP has partnered with area lending institutions to offer financing of larger efficiency projects undertaken by customers. WLP pays rebates on these large projects as well. Finally, WLP adds a 3% surcharge to commercial customers' bills. This surcharge is held as efficiency credit that accumulates. Commercial customers can use the credit to make efficiency improvements

Projected Performance

Year	Participants	Cost	kWh reduction
2010	18	$17,473.00	261000
2011	50	$17,826.00	725000
2012	52	$18,227.00	746750
2013	53	$18,637.00	769153
2014	55	$19,056.00	792227
totals	227	$91,219.00	3,294,130

Cost Benefit Analysis

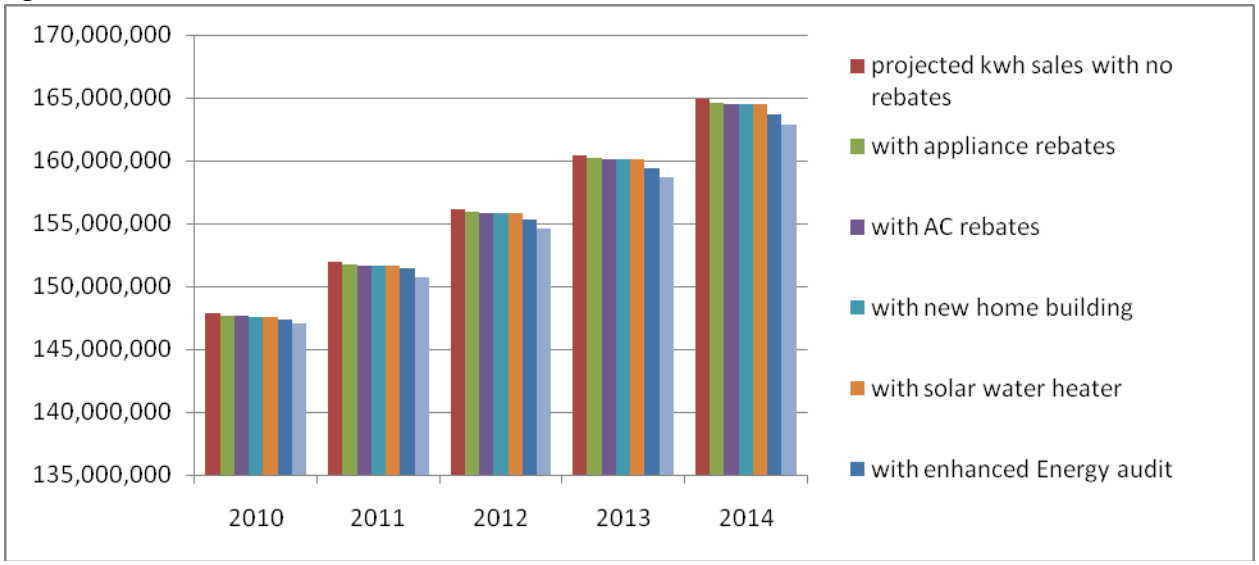
Benefit Cost Test Results

Benefits, Costs, Net Benefits and B/C ratios					
	TRC	Utility	Participant	RIM	Societal
NPV Benefits	2508230	2508230	731844878	2508230	3998809
NPV Costs	674600	283297	561381	732128176	893180
NPV Net Benefits	1833630	2224933	731283497	-729619945	3105629
B/C Ratio	3.72	8.85	1304	0.00	4.48

Total Demand Reduction

The graphs below show the projected demand reduction from 2010 through 2014. Figure 1 shows the incremental effect of each program on load growth.

Figure 1



The purpose of figure 1 is to show how all demand side management programs work to 'chip away' at the load growth.

Figure 2

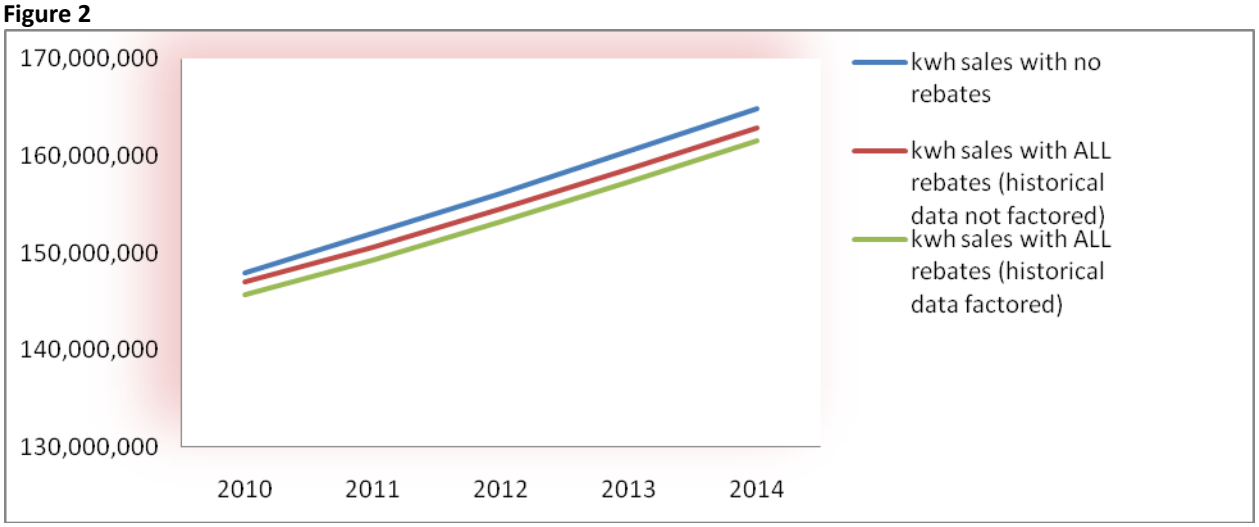


Figure 2 represents the difference between demand growth if no conservation programs were in effect versus the planned demand side management program. The green line represents demand growth reduction with previous conservation efforts factored in and shows that when previous efforts are included, the demand reduction is even more drastic

Table 2 shows the demand reduction across the five projected years.

Table 2

	Programs to Date	2010	2011	2012	2013	2014	Total
kwh sales with no rebates	2,183,117,174	147,900,789	151,968,061	156,147,182	160,441,230	164,853,364	781,310,626
kwh sales with ALL rebates (historical data not factored)	2,028,566,923	147,246,414	150,840,540	154,739,015	158,835,811	163,044,114	774,705,895
kwh sales with ALL rebates (historical data factored)	2,028,566,923	145,916,522	149,510,648	153,409,123	157,505,919	161,714,222	768,056,433
difference(historical data not factored)	154,550,251	654,375	1,127,521	1,408,167	1,605,419	1,809,249	6,604,731
difference(historical data factored)	154,550,251	1,984,267	2,457,413	2,738,059	2,935,311	3,139,142	13,254,193
percent reduction (historical data not factored)	7.08%	0.44%	0.74%	0.90%	1.00%	1.10%	0.85%
percent reduction (historical data factored)	7.08%	1.34%	1.62%	1.75%	1.83%	1.90%	1.70%

The goals set forth by WLP show the demand side management program hitting its load growth reduction goal of 1.1% by 2013. When conservation efforts from previous years are factored in, the reduction goal is eclipsed the first year.

In addition, the conservation programs will result in WLP customers using nearly 7.5 million fewer kWh than they would without such programs. Assuming a rate of $.085/kWh, these conservation programs stand to save WLP customers $637,500 over the next five years

Concluding Remarks

In summary, the goals set forth for the Waverly Light and Power demand side management programs stand to reduce demand growth 1.1% by 2013. This reduction in growth falls in accordance with guidelines recommended by The Energy Center of Wisconsin. Additionally, the diversity of programs offered ensures that participation in the programs is widespread, thereby spreading out the energy savings benefits.

When implemented, the new demand side management programs could save WLP customers an additional $637,500 via reduced demand, assuming the goals set forth in this document are met. Moreover, new facility projects stand to also make efficiency improvements. Finally, the ambitious goals outlined above continue the tradition of leadership and forward thinking for which Waverly Light and Power is known.

Appendix 13

Wisconsin Public Power, Inc.
Supplemental Information

WPPI ENERGY
IOWA MEMBER UTILITIES

Energy Efficiency Programs

Program Descriptions

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Introduction

WPPI Energy is a regional power company serving 51 customer-owned electric utilities in Wisconsin, Upper Michigan and Iowa. Through WPPI Energy, these public power utilities share resources and own generation facilities to provide reliable, affordable electricity to more than 192,000 homes and businesses.

WPPI Energy was created to provide members with a highly reliable, cost-competitive power supply for the long term and excellent services. WPPI Energy offers programs and services to help residential and business customers save energy, thereby protecting the environment, helping to keep customer bills down, and delaying the need for new, expensive plants.

WPPI Energy takes very seriously our obligation as good stewards, helping to make our communities better places to live and work. This means protecting our environment while controlling costs and helping customers keep electric bills down for the long term. WPPI Energy is committed to helping customers save energy, and fostering the use of renewable energy resources that is crucial to our energy future.

We're also committed to leading by example. WPPI Energy has decreased energy consumption at our office facility by 15 percent and has challenged our members to do the same. On a system-wide basis, WPPI Energy has increased our conservation funding and increased our conservation programs by more than 300%.

As customer-owned utilities, WPPI Energy and our members understand the direct connection between our mission to provide reliable electricity at affordable prices and the need for stewardship that protects our energy resources, the environment, and the economic well-being of our communities. We recognize stewardship as an underlying principle of the public power model. It's the way energy should be.

Our menu of program and services are developed with the guidance and endorsement of member advisory groups. Members have carefully developed WPPI Energy into a resource that strengthens their local advantage and adds value for their communities.

In addition to the energy efficiency programs available through the Iowa Association of Municipal Utilities, the WPPI Energy program portfolio includes several energy efficiency options for implementation by its member utilities. These programs are described in this document.

Summary of Programs

Residential Programs

Central Air Conditioner Tune-up

Customers can receive incentives when they have their central air conditioning system tuned up and inspected by a professional technician.

Responsible Residential Appliance Recycling

This program provides pickup and recycling services for customers with older inefficient appliances.

Tree Power! Incentive

Tree Power! provides incentives to customers who plant shade trees in locations that reduce the cooling load on the home's air conditioning system.

ENERGY STAR® Bulb Giveaway

The ENERGY STAR® Bulb Giveaway educates consumers about compact fluorescent lighting technology.

GreenMax Home

The GreenMax Home initiative encourages homeowners to build or remodel homes that use reliable, sustainable energy systems to produce as much energy as they consume, resulting in "net zero energy used."

Commercial & Industrial Programs

Efficiency Improvement Incentive

The WPPI Efficiency Improvement Incentive helps businesses invest in efficiency improvements with financial assistance to defray the cost of energy efficiency projects.

RFP for Energy Efficiency

The RFP for Energy Efficiency provides incentives via a competitive bid process for large efficiency projects.

Shared Savings

The Shared Savings Program provides up-front capital to advance energy efficiency improvements. Customers then repay the funding through installments on their monthly utility bill.

New Construction Design Assistance

This program provides assistance from energy efficiency consultants to improve the energy efficiency of non-residential new construction projects before they are built.

Study Grants

This program helps offset the cost of studies that identify electrical energy savings and demand reductions.

Energy Management Services for Schools

This program provides technical guidance, expert support services and financial assistance to schools to assist them with managing their energy use and controling costs in existing and planned school facilities.

Renewable Energy Programs

Renewable Energy Customer Incentive

This initiative encourages the installation of renewable energy technologies with financial grants of up to $10,000 for qualifying wind, photovoltaic or solar domestic hot water systems.

Educational Programs

Home *Energy* Suite

The Home *Energy* Suite is an online tool that lets customers calculate the estimated cost of energy use in their homes.

National Theatre for Children

The National Theatre for Children is a live performance school program designed to educate young people on electrical safety, energy conservation and renewable energy.

The Local Circuit

The Local Circuit is a twice-yearly newsletter that informs customers about utility programs and services, energy efficiency, technology and industry information.

RESIDENTIAL PROGRAMS

Central Air Conditioning Tune up Incentive

Program	Central Air Conditioning Tune up Incentive
Objective	Encourage customers to have their central air conditioning system tuned up and inspected by a professional service technician.
Program Description	Without regular maintenance, a central air conditioning unit can lose up to 5% of its original efficiency for each year of operation. This means that a 12.0 Seasonal Energy Efficiency Ratio (SEER) unit purchased just a few years ago may now be functioning with the efficiency of a 9.0 SEER unit. In addition, dirty coils and filters on an air conditioner will reduce its ability to dehumidify properly. Because air conditioners contribute a significant portion of the summer peak demand, this program provides direct value and savings to the utility, the community and WPPI Energy. Customers benefit through improved energy efficiency, reduced utility bills, extended equipment life and increased comfort.
Eligible Measures	Incentives are available to customers with central air conditioners no larger than five (5) tons that have not received a tune-up within the last three years. The tune-up must be performed by a professional service technician and include the following inspection: • Check and clean condensing unit coils • Check wiring and connections • Check coolant level • Check system operating pressures and temperatures against manufacturers specification • Check condensate pump and drain line • Check thermostat • Inspect air filter and replace if necessary • Check compressor contacts • Check belts and drives • Clean and adjust controls • Lubricate moving parts and clean indoor fan • Check voltage
Customer Incentive	Varies by utility; typically $25 to $35.
Implementation Strategy	The program is promoted through bill inserts, customer newsletters and communications with trade allies. Customers receive the incentive payment after the tune-up and inspection is completed and a sales invoice is submitted.

Residential Appliance Recycling Program

Program	Responsible Appliance Recycling Program
Objective	This program provides pickup and recycling services for customers with older inefficient appliances. In addition to reducing the customers' energy costs, this program reduces landfill use through the recycling of useful refrigerator and freezer parts and recovery of dangerous PCBs and ozone-damaging CFCs.
Program Description	The primary objective of the appliance recycling program is to eliminate old, inefficient appliances that would otherwise remain plugged in without the program and to provide a responsible, easy and hassle-free way for customers to dispose of those inefficient appliances. Recycling includes the recovery and disposal of the ODS foam blowing agent. The program meets the Environmental Protection Agency's (EPA) Responsible Appliance Disposal (RAD) Program requirements. The cost for pick up and recycling is paid for by the utility. A maximum of two appliances is allowed per customer.
Eligible Measures	The program is available to all residential customers. Eligible appliances are refrigerators, freezers, dehumidifiers and room air conditioners that are in working order.
Customer incentive	Some WPPI utilities may include a $20 rebate/incentive paid to the customer for appliances turned in; maximum one $20 incentive per customer.
Implementation Strategy	Member utilities promote the program with bill inserts, newspaper ads and newsletters. To participate, customers call a toll-free number or go online to schedule an appointment.

Tree Power! Cash Incentive

Program	Tree Power! Cash Incentive
Objective	To provide financial incentives to customers who plant qualifying shade trees in a location that reduces the cooling load on the air conditioning system, or provides shade directly to the south or west side of the building.
Program Description	Besides beautifying the landscape, preventing soil erosion, providing wildlife habitat and reducing noise, strategically planted trees can also save money and energy in heating and cooling. Shade trees on the south and west sides of a home can reduce air conditioning costs in the summer, while allowing the warming sunlight through when leaves are gone in the winter.
Eligible Measures	Deciduous trees with a trunk diameter of at least 1¼ inches are eligible for an incentive, typically 50% of the purchase price, up to $50 per tree. Each household or account is eligible for a maximum of three (3) tree incentives per year.
Implementation Strategy	The program is promoted through bill inserts, customer newsletters and communications with trade allies. Customers receive the incentive payment after the tree is purchased and planted and a sales invoice is submitted.

ENERGY STAR® Bulb Giveaway

Program	ENERGY STAR® Bulb Giveaway
Objective	The ENERGY STAR® Bulb Giveaway helps educate consumers about compact fluorescent lighting technology.
Target Market	The Energy Star® Bulb Giveaway is available to any residential retail customer of a participating WPPI Energy member utility.
Program Description	Compact fluorescent lamps (CFLs) labeled with the Energy Star® logo save time, money and energy. While CFLs cost more to purchase, they pay for themselves quickly because they use 75% less energy than standard incandescent bulbs, and last 10 times longer. Through the Energy Star® Bulb Giveaway progam, WPPI member utilities distribute compact fluorescent lamps to customers at various times during the year, providing an opportunity to try an Energy Star®-labeled CFL at no cost. The promotion also encourages additional purchases by promoting Energy Star® Cash Back Rewards at participating local retailers.
Implementation Strategy	Member utilities designate a promotional period (e.g., one to two weeks in the spring, during utility open houses, Public Power Week or other community events) where customers can come in to the utility office and choose one of four CFL bulbs: 15W, 20W, 25W and 30W. Customers also receive information about the CFL technology, appropriate applications and places to purchase additional bulbs.

GreenMax Home Program

Program	GreenMax Home Program
Objective	WPPI Energy's GreenMax Home initiative encourages homeowners to build or remodel homes that use reliable, sustainable energy systems. The home designs and occupant lifestyles required to achieve net zero energy use must be replicable and appropriate for a mass market, community-based setting.
Target Market	Residential customers who are in the planning stage of building a new home or remodeling an existing home. Only homes built in the service area of one of WPPI Energy's member utilities are eligible for funding.
Program Description	A GreenMax Home is a home that has the potential to produce as much energy as it uses in a year. The project supports the design and lifestyle choices that move a home from "highly efficient" to "net zero." A net zero energy home (NZEH) has the potential to produce as much energy as it uses, through energy-efficient construction techniques and the use of renewable energy systems. To the greatest extent possible, the energy consumption (heating, cooling and electrical) of the home is provided by renewable energy sources.
Customer Incentive	Program funding shares the incremental cost of building a NZEH or remodeling a home to bring it to net zero. WPPI Energy will offer technical assistance and will measure the home's energy and environmental impacts following project completion. Since homeowners gain direct benefits from living in a GreenMax Home, they are expected to pay a portion of the incremental cost.
Implementation Strategy	WPPI Energy solicits proposals from individuals, builders or architects interested in building a net zero home. One or more proposals are selected to receive funding from WPPI Energy to cover part of the incremental cost of designing and building a NZEH over the cost of constructing a conventional house. The home designs and occupant lifestyles required to achieve net zero energy status must be replicable and appropriate for a mass market, community-based setting. WPPI Energy documents the building process, measures energy and environmental impacts and publicizes the findings. Homeowners are asked to share the house for a few tours and to be spokespeople for the technology and lifestyle choices. Upon completion of the home WPPI will monitor the home and its occupant's energy use for at least one year to ensure all energy consumption and production goals were met.

COMMERCIAL & INDUSTRIAL PROGRAMS

Efficiency Improvement Incentive

Program	Efficiency Improvement Incentive
Objective	Most businesses have the opportunity to lower their energy costs and increase facility comfort or productivity through energy efficiency measures. However, not all businesses have the resources to make these improvements a reality. The WPPI Efficiency Improvement Incentive is designed to help businesses invest in efficiency improvements.
Target Market	All customers with peak demand greater than 200 kW and all public and private schools.
Program Description	OVERVIEW Efficiency Improvement Incentives help businesses implement cost-effective energy efficiency projects that otherwise would not be completed. Qualifying projects receive incentive payments based on the technology and amount of on-peak demand and energy they reduce. The incentives are distributed upon verification of project completion. AVAILABLE INCENTIVES Study grants and project implementation incentives are available to help customers identify and cost-effective energy efficiency projects that otherwise would not be completed. Prescriptive incentives for projects will be available on proven technologies that effectively reduce demand and energy use for customers. Prescriptive incentive amounts for each technology are based on typical energy savings from similar installations. These incentives will be used for many qualifying measures. Custom-prepared incentives for projects are determined based on a calculation of utility peak demand reduction, energy savings and customer payback for the specific proposed project. Customized incentives are used where prescriptive incentives are not practical.
Eligible Measures	Eligible projects include any new electrical energy-saving or demand-reducing measure that will result in lasting impacts for the facility, the utility and WPPI Energy and that meet minimum efficiency requirements set by the program. Previously installed or retrofitted measures do not qualify. QUALIFYING MEASURES To qualify, measures must meet minimum efficiency requirements. Eligible measures include, but are not limited to: · Lighting · HVAC

	· Motors and drives · Compressed air systems · Electric chillers · Food service measures · Agricultural process equipment · Specialty measures (e.g., anti-condensate heater controls, LED refrigerated case lighting, guest room energy management controls, PC network management, vending machine controls) · Energy efficiency studies

RFP for Energy Efficiency

Program	RFP for Energy Efficiency
Objective	The RFP for Energy Efficiency seeks large efficiency projects that reduce annual total energy consumption by 150,000 kilowatt-hours or more, and/or projects that will reduce the on-peak electrical demand by at least 25 kilowatts from 1PM to 4PM during the months of June, July, and August.
Target Market	The program is designed to encourage investment by large commercial and industrial utility customers in energy efficient improvements. Up to $250,000 of incentive funding is available for each bid cycle. The program is open to all commercial, industrial, and institutional power customers receiving electric service from a WPPI Energy member utility.
Program Description	The Request-For-Proposals (RFP) for Energy Efficiency Program was designed by WPPI Energy to increase the magnitude of cost-effective energy improvement projects that large power customers can accomplish. The program is structured to use a request-for-proposal format, and enables large commercial and industrial customers to bid for funds and secure their own level of funding needed to advance selected efficiency improvement projects. The RFP for Energy Efficiency Program is an alternative approach to utility incentives. It allows customers the flexibility to determine how best to meet their financial requirements while maintaining their eligiblity for other WPPI Energy incentive programs. To participate, customers must complete and submit a Bid Application Form along with the following: Project Background Attach a detailed description of the proposed project. Include background detailing how this project was chosen (e.g. energy audits, planned maintenance upgrades, efficiency management plan). Describe other energy efficiency opportunities that were explored, and if the completion of this project could lead to similar projects if this one is successful. Include information on non-energy saving project benefits, how the projects affects the facility, and if there are plans to measure the energy savings. Higher rankings projects are comprehensive and combine multiple energy savings measures. Statement of Need This will describe how the requested incentive is necessary to support your company's financial goals. It may include ROI, corporate hurdle, high risk, project payback, or other barriers. Also, provide details on any other funding sources for the project such as incentives, grants, low interest loans, manufacturer's discounts, etc. Vendor Proposal Attach a copy of the vendor proposal for the project to the Bid Application, including a description of the equipment to be installed, technical details with copies of

	manufacturer specifications, and total cost of the project. Estimate of Savings Attach an estimate of the electrical demand and energy savings to the Bid Application, with all the equations and assumptions clearly stated. Estimates of savings include a detailed examination of the baseline energy use and projected energy and demand reductions, as well as a plan for verification of saving after project completion. The use of electronics spreadsheets is encouraged. If a simulation is used, please provide a description of how the simulation calculates the savings. Documentation of a baseline condition is required. Project Timeline Attach a projected schedule that shows necessary management and budget approval dates, vendor contract negotiations, engineering and design, equipment delivery and installation, and project completion.
Eligible Measures	Projects must reduce annual energy consumption by 150,000 kWh or more and/or Reduce site electrical demand by 25 kW or more during the on-peak hours of 1 PM to 4 PM, Monday through Friday, during the months of June, July, and August.

Shared Savings Program

Program	Shared Savings Program
Objective	The Shared Savings Program provides up-front capital to advance energy efficiency improvements.
Target Market	Customers who defer energy cost reduction measures because of “first-cost” barriers.
Program Description	Through the Shared Savings Program a customer may receive up to $50,000 to implement qualifying energy efficiency improvements. The customer then repays the funding through installments on their monthly utility bill. Often the payments are less than the energy cost savings, resulting in a positive cash flow for the customer. Funding can range from $2,500 to $50,000 based on the cost and energy savings potential of the project, and will not exceed the project cost. Projects may include any new electrical energy-saving or demand-reducing measure that results in lasting impacts for the facility.
Eligible Measures	<u>Customer Eligibility</u> Customer must have three years of established utility bill-payment history, complete an application package for consideration and pass a comprehensive credit review. <u>Project eligibility</u> • Equipment must meet minimum efficiency requirements. • Projects must reduce electric use and/or electric demand for the duration of the repayment period (60 months) at a minimum. • Customer must agree with all requirements relevant to the location and installation of project equipment as defined in the agreement. • Project cannot be implemented (including any engineering and/or equipment purchases) prior to the written execution of an agreement between the customer and utility. • Previously installed or retrofitted measures do not qualify. <u>Terms and conditions</u> • Shared Savings funding will equal the project energy savings over 60 months less any prescriptive incentives or other outside funding. The total combined funding will not exceed the project cost. • Repayment occurs over a 60-month period. • Payments include a 2 percent APR service fee, compounded monthly. • Project funding can range from $2,500 to $50,000 based on the cost and energy savings potential of the energy efficiency improvements. • Upon completion, applicant must submit a Certificate of Project Completion form.

New Construction Design Assistance

Program	New Construction Design Assistance
Objective	The New Construction Design Assistance program seeks to capture energy savings by encouraging the design and construction of buildings as integrated systems. Opportunities for energy savings are identified by simulating incremental efficiency improvements in lighting, HVAC and other building systems.
Target Market	New construction projects and major renovations to existing buildings. The program provides assistance from energy efficiency consultants to improve the energy efficiency of non-residential new construction projects before they are built.
Program Description	A construction project is the ideal time to design and build for energy efficiency, peak load reduction, improved systems performance and greater comfort. The New Construction Design Assistance program assists prospective building owners and developers, design professionals and construction contractors in delivering high performance buildings that will achieve these benefits. Financial incentives may be provided to owners of accepted projects; these incentives are intended to overcome barriers that would otherwise prevent the installation of efficiency measures. Technical assistance services and design incentives can also be provided to design team members to help offset the cost of advanced designs. Services may include facilitation in the design process, reviewing plans and construction documents, assisting with research and product selections, modeling energy saving options, and verifying installation and operation of measures. Prescriptive financial incentives may be available for individual technology upgrades.
Eligibility	Open to all non-residential electric customers that are planning for new buildings, additions, multi-family residential new buildings or major “gut” renovations that meet state energy code. The program is also open to education, manufacturing, municipal buildings, institutional buildings, retail, owner-occupied offices and owners interested in LEED certification. Projects should have their site approvals and financing in place and should be ready for the design phase. If the project meets eligibility requirements, participants must submit an Application to Participate to request participation in the program. Requests to participate are evaluated by WPPI Energy on a case-by-case basis. Building size, project type, design phase and project opportunities will guide the selection of participants. Prospective participants are encouraged to apply early in the design phase to earn the highest potential incentive. A project must enter the program during the design process, or must be willing to upgrade the energy-saving measures beyond current efficiency levels.

	All financial incentives must be pre-approved by WPPI Energy. Projects that have or will receive funding from other energy efficiency programs available to businesses will be reviewed on a case-by-case basis for funding from this program. Projects will not be accepted if the energy-saving measures have already been purchased or installed.
Implementation Strategy	Targeted education, information and outreach. Information on integrated design practices and its energy-saving benefits will be provided directly to participants through the program. Presentations will describe the opportunities for — and benefits of —incorporating energy-efficient design strategies into new building construction. Target audiences include community governing bodies, owners, developers and architectural and engineering professionals. Technical assistance during the building design process. Facilitation services will be provided early in the design process, helping owners and design teams to identify and select energy-saving and demand-reduction measures and strategies to incorporate into the construction project. Activities may include participation in design meetings, providing energy saving ideas and design strategies, estimating financial incentives, reviewing plans and construction documents, identifying LEED compliance strategies, and assisting the design team and owners with research and product selections. Projects receive the greatest benefit if design assistance is started in the schematic design phase or earlier. Building energy modeling. The program can provide detailed analysis of high performance building design, showing the impact on a building's energy usage as it relates to changes in the architectural design, orientation, floor plan layout, building envelope construction, HVAC systems and equipment, and lighting. Energy simulation may involve a single technology, an end-use system or a whole-building integrated design analysis. Results from the energy simulation may be used by WPPI Energy to calculate financial incentives. Varying levels of analysis and simulation will be provided as appropriate by project, and incentives will be available for those design firms capable of doing their own modeling.

Study Grants

Program	Study Grants
Objective	This program helps offset the cost of studies that identify electrical energy savings and demand reductions. The goal is to encourage energy efficiency and conservation projects at customer facilities.
Target Market	Customer facilities with an electrical peak demand exceeding 200 kilowatts (kW).
Program Description	Study grants provide funding for studies that provide customers with estimated project costs and estimated energy-saving benefits from the specified electrical efficiency improvements. An eligible study is conducted by a third-party contractor of the customer's choice. Examples of eligible studies include compressed air surveys, pump analyses, process evaluations, energy efficiency project feasibility studies and other specialized technology reviews. Study grant funding may also be used to contract technical services such as energy audit support, technical design review, equipment or process energy analyses, or other specific project support.
Eligibility	Customer facilities with an electrical peak demand exceeding 200 kilowatts (kW) are eligible for study grants. Public school facilities are also eligible regardless of building load.
Implementation Strategy	To apply for a technical study grant, applicants obtain a study proposal from their selected third-party contractor and submit a copy to WPPI Energy. If the proposal clearly demonstrates that electrical energy efficiency improvements will be evaluated, WPPI will send a letter to the applicant to document the request and reserve the grant funding. Upon completion of the study, a copy of the results and a copy of the invoiced study are submitted to WPPI. The grant is then issued to the electric customer in the form of a check payment or a credit on the customer's utility bill.

Energy Management Services For Schools

Program	Energy Management Services For Schools
Objective	The Energy Managements Services for Schools Program provides technical guidance, expert support services and financial assistance to improve the management of energy use and control costs in existing and planned school facilities.
Target Market	Public and private schools within the service territories of WPPI Energy member utilities.
Program Description	Strategic Energy Planning. WPPI Energy will help the school district to prioritize potential energy efficiency projects, develop project specifications and implement the measures. To qualify, the school board must review the results of the audit, commit to improve district energy efficiency and adopt an energy efficiency policy. Funding for strategic energy planning will be limited to $3,000 per district. Upon adoption of an energy efficiency policy, the district will be eligible for double the normal financial incentives for projects with an eight-year or less simple payback, computed using our Efficiency Improvement Incentive guidelines. Funding of up to $15,000 is available to match incentive funding from the Efficiency Improvement Incentive program. Total incentives are capped at 60 percent of the project cost. Energy Education Any district qualifying for the strategic energy plan consultation will also be eligible for energy education assistance. We will work with interested teachers to develop curriculum activities that emphasize energy management at the school and energy efficiency applications in homes and businesses. Funding will be limited to $1,000 per district. ENERGY STAR Rating A district that qualifies for an ENERGY STAR award on one or more of its buildings may apply for a grant to pay for the Professional Engineer (PE) services needed to certify the rating. The PE grant will provide up to $500 per building. The district will receive public relations assistance in order to celebrate their success and educate the community about their efforts. New Building Energy Design For districts planning to add school buildings, we can provide New Construction Design Assistance. This service predicts energy use and analyzes options for heating, cooling, ventilating and lighting (including day-lighting design).
Eligibility	All public and private schools within the service territories of WPPI member utilities are eligible for this program. To benefit from the Energy Management Services for Schools Program, the school district must commit to an initial assessment of their electric energy usage and provide energy consumption histories for all other fuels, such as gas and fuel oil. The participating school district must agree to administrative-level discussions of energy

	efficiency analyses and energy management activities. This may also include a written commitment from the school district to incorporate energy management in job descriptions, in administrative policies and budgets, and into the curriculum by promoting training for appropriate teachers. There may be some additional time commitment and/or costs to the school district for staff involvement in coordinating energy management activities.
Implementation Strategy	PROGRAM SEQUENCE <u>Energy Benchmark</u> Participating school districts, with WPPI and member utility assistance, will be required to obtain an energy efficiency rating for each of their school buildings using the Portfolio Manager on the ENERGY STAR® web site. Upon successful completion of the rating process, the district will be eligible to receive $500 per school benchmarked; this funding can be spent on specific energy-efficient tools and products. <u>Comprehensive Audits, Training and Re-commissioning</u> For each building rated, the district is eligible for a comprehensive energy audit. To qualify, the district administrator or delegate, with WPPI and member utility assistance, must present the efficiency rating results to the district school board. The audit funding is limited to $3,000 per district. If the district selects their own auditor, the grant will be limited to 50 percent of the auditor's fee up to a maximum of $3,000. Upon completion of an audit on at least one school facility, the district will be eligible for one $500 scholarship to send the person responsible for facilities to Building Operator Certification training. Also upon completion of the audit, the district will be eligible for an incentive for re-commissioning services on selected building energy systems. Funding will be limited to 50 percent of the commissioning cost up to $10,000 per district.

RENEWABLE ENERGY PROGRAMS

Renewable Energy Customer Incentive

Program	Renewable Energy Customer Incentive
Objective	This program provides financial assistance to customers who install renewable energy systems, with a goal to increase the use of renewable energy technologies in residential and small businesses. These projects can increase acceptance of renewable energy and encourage others in the community to install systems of their own.
Program Description	The Renewable Energy Customer Incentive offers rebates of up to $10,000 to customers who install qualifying wind, photovoltaic or solar domestic hot water systems. Rebates are available for the following technologies: • Solar domestic hot water systems with electricity as the backup fuel, including installation of new systems or repair of existing systems that are inoperable • Solar thermal systems where electricity is the primary heating fuel • Photovoltaic (PV) systems • Small-scale wind energy systems of less than 20 kilowatts (kW) In addition, cash rebates are available for feasibility studies that will help customers determine whether a renewable energy system installed at their site will operate effectively. The program will reimburse customers for 75 percent of the site survey costs, up to a maximum reimbursement of $375.
Eligibility	The Renewable Energy Incentive is available to electric customers served under a residential or general commercial rate in WPPI Energy member communities in Iowa and Michigan. WPPI Energy member customers in Wisconsin communities are eligible for incentives through the Wisconsin Focus on Energy program and are therefore not eligible for incentives through this program. PROJECT ELIGIBILITY • Solar domestic water heating systems. New solar water heater installations that replace or supplement an existing domestic hot water service are eligible. The rebate on qualifying systems will be $30 per square foot of collector area for systems with electricity as the backup water heating fuel, or $25 per square foot of collector area for systems with propane or natural gas as the backup water heating fuel. Maximum incentive is capped at the lesser amount of $3,500 or 35 percent of the project cost. • Solar thermal heating systems. New solar heating installations that supplement the building's primary electric space heating system are eligible. Propane and

natural gas space heating systems are not eligible. Electric space heating must provide more than 50 percent of the building's space heating needs.

- Photovoltaic (PV) systems. Rack-mounted or building-integrated PV systems, rated at 20 kW or less, are eligible. Rebates on qualifying systems will be calculated by WPPI Energy and will be based on estimated annual energy production as follows:

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New construction — $3 per kilowatt-hour (kWh)
Existing buildings — $2.50 per kWh for NABCEP-certified dealers*, $2 per kWh for non-NABCEP-certified dealers

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The maximum incentive is capped at $10,000.

- Small-scale wind systems. Eligible projects include installed wind-energy systems rated at 20 kW or less. If installed for grid connection, the local electric utility must approve system interconnections prior to installation. The rebate on qualifying systems is 25 percent of the system cost; incentive is capped at $10,000.

- Existing systems. Customers with existing inoperable renewable energy systems can receive a rebate of up to 50 percent of the repair cost for their existing solar domestic water heating, PV or small-scale wind system. The maximum incentive is $2,500.

TERMS AND CONDITIONS

- Participants will be responsible for the total cost of their renewable energy system, less the financial assistance provided by WPPI Energy.

- Customers must submit their proposed project to WPPI Energy for eligibility evaluation. Customers with accepted projects will receive confirmation from WPPI Energy. Customers will then have five months to complete their project and must submit a copy of their acceptance letter to the WPPI Energy Program Administrator, along with documentation of the installed system's specifications and payment receipts, to receive their rebate.

* Certification of Solar PV Installers is a voluntary process offered by the North American Board of Certified Energy Practitioners (NABCEP) to individuals who have met specific qualifications.

EDUCATIONAL PROGRAMS

Home *Energy* Suite

Program	Home *Energy* Suite
Objective	Residential customers look to their energy providers for information on energy efficiency and energy savings, and view their energy providers as the expert. An online resource to help residential customers lower their energy bills and save money is a useful service. Home*Energy*Suite™ provides customers with Internet access to the energy answers they seek and provides one-stop-shopping for the residential customer's energy information needs.
Program Description	Home*Energy*Suite gives customers the opportunity to conduct a self analysis on their home and review scenarios that will help them save energy and money. Home*Energy*Suite is an online interface that includes the Home *Energy* Calculator, Residential Energy Systems Library, Kids Korner, specialty calculators and more. The online analysis is free.
Implementation Strategy	WPPI member utilities promote the Home*Energy*Suite to residential customers throughout the year via mailings and personal interaction. Member utilities without a web presence refer customers to the WPPI Energy site to use the resources of the Home*Energy*Suite.

National Theatre for Children

Program	National Theatre For Children
Objective	The National Theatre for Children is a live performance school program designed to educate young people on electrical safety, energy conservation and renewable energy.
Target Market	Elementary grades K-6.
Program Description	National Theatre for Children is a Minneapolis-based performance troupe presenting live theatre in schools on behalf of sponsoring organizations. The organization is dedicated to educating young people on important and timely energy-related topics. Combined with printed curriculum materials and teacher guides, their imaginative and customized presentations effectively reach the students, teachers and parents. The NTC tour takes place annually throughout WPPI Energy member communities. The cost of the performance is underwritten by the local utility.

The Local Circuit

Program	The Local Circuit
Objective	To provide residential and commercial customers with timely information on utility programs and services as well as energy efficiency, technology and industry information.
Program Description	Many customers have an interest in saving energy. The Local Circuit newsletter is a bi-annual publication that keeps customers informed on current energy issues and available member programs and services. The publication is distributed to customers in WPPI Energy communities twice yearly in May and September. The Local Circuit reaches more than 190,000 customers in Wisconsin, Iowa and Upper Michigan. There are no costs to receive the publication.